8-2022

# Rewilding with AR and VR: Facilitating Care with Photography in Physically Immersive Apps

Kailan Sindelar
ksindel@g.clemson.edu

REWILDING WITH AR AND VR: FACILITATING CARE
WITH PHOTOGRAPHY IN PHYSICALLY IMMERSIVE APPS

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Rhetorics, Communication, and Information Design

by
Kailan Smith Sindelar
August 2022

Accepted by:
Dr. Jordan Frith, Committee Chair
Dr. Michelle Smith
Dr. Matthew Browning
Dr. Lauren Cagle

ABSTRACT

In this dissertation I analyze two AR apps from Internet of Elephants, *Safari Central* and *Wildeverse*, and one VR app from National Geographic, *National Geographic: Explore VR*. These three apps use photography as the central tool for engagement, attempt to educate users, and prompt them to care about wildlife and wilderness. However, the ethical consideration of design has largely ignored representations of the environment, especially as it may intersect with facilitating care for wilderness and wildlife that is experiencing the effects of habitat destruction and environmental degradation. This project begins developing a critical discussion of how wilderness and wildlife are selectively created through CGI by asking two research questions: *What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?* and *How can these designs be revised or leveraged for more beneficial environmental communication through care ethics?*

To answer my research questions, I use methods from game studies and a methodological lens informed by care ethics, new materialism, and feminist materialism. My results show that these apps facilitate an underdeveloped researcher/subject and patron/recipient roles. In answering my second research question, I craft three approaches for applying care ethics: 1) designing based on performances, 2) modeling behavior, and 3) engaging in a reflective photographic review process. This dissertation attempts to support the rewilding of media, which helps people reconnect (rewild) with (other) forms of wildlife and wilderness.

DEDICATION

This work is dedicated to my three closest partners in life: my husband and two
little dogs. Thank you for your continual support, kindness, and love.

# ACKNOWLEDGMENTS

I want to express my gratitude for Jordan Frith, who has tirelessly supported this project since its beginning with invaluable feedback and encouragement. The hours he spent sharing his expertise, especially over zoom during the pandemic, was essential to this project. I also appreciate his ability to incorporate his dogs into his work, and I have enjoyed having the freedom to do the same in my work. I want to thank Michelle Smith for always being generous with her mentorship as well as a generous reader. Her ability to read my roughest drafts and see where I was going, and be excited along the way, helped me believe in my work. I also extend a great amount of gratitude to Matthew Browning, who has been incredibly welcoming since I first reached out to him about working with the VR and Nature Lab. His trust in my ability to collaborate on projects has helped me grow an interdisciplinary scholar, and his inclusiveness is something to strive toward. I also want to thank Cagle for providing me with so much time and energy at a distance. Her careful inquiries and nudges led me to important breakthroughs.

While I cannot acknowledge all of those who have significantly guided me during my time at Clemson, I would like to especially thank the South Carolina Botanical Gardens. I made unexpected connections with people and plants during my time taking classes for the SC Native Plant Certificate and during Master Gardener classes. I spent countless hours in the gardens for leisure and for projects. These gardens were a place for me to practice listening, and that practice has helped me on many strange trails.

TABLE OF CONTENTS

Table of Contents (Continued) Page

Table of Contents (Continued)                                            Page

LIST OF TABLES

List of Tables (Continued)

LIST OF FIGURES

List of Figures (Continued)

Figure                                                                                      Page

List of Figures (Continued)

CHAPTER ONE

INTRODUCTION: WHAT DOES IT MEAN TO REWILD WITH AR AND VR?

In 2016 I attended the Association for Teachers of Technical Writing (ATTW) conference, where I participated in a workshop on wearable technology in technical communication. The workshop addressed how wearable technology communicated information for patients who had trouble expressing their emotional states. One example was a patient who wore a device that recognized when he was stressed. This device communicated his emotional state in very basic terms, but it was enough to help doctors and nurses give him better care. While this workshop was entirely focused on humans, I began wondering how something like this could help us better understand animals' needs. Could we better listen to the needs of animals through emerging technologies?

From then on, I was interested in finding different ways to listen to environments. As I considered emerging media in environmental communication, I noticed that augmented reality (AR) and virtual reality (VR) kept arising in public engagement and education. AR and VR experiences included difficult to access experiences, such as places that are particularly remote or dangerous. These experiences are a far cry from communicating through direct input, like a wearable monitor, but I began to realize that there is no lack of direct input from the environment through technology. We already have direct observations from environments via scientific devices. In other words, the problem that these AR and VR apps are addressing is not a lack of hearing but of listening. I began to see these technologies as a way to support rhetorical listening, as a way to help users rhetorically listen to environments.

Sindelar 13

Rhetorical listening prompts people to engage their emotions to question why they respond to what they are hearing in the ways that they do (Jung, 2005). This can include questioning why one feels threatened, what they have at stake in the discussion, in what ways the listener and speaker are alike or different, and how their world views are differently informed (Glenn & Ratcliffe, 2011). It may be a little ironic that my search for ways to facilitate rhetorical listening lead me to such visually oriented technologies, but rhetorical listening does not need to be limited to auditory listening. For example, Suellynn Duffey (2011) writes about how one of her students held a different posture as she listened. Duffey learned to listen to the different paralinguistic performance of one of her students: she "had to listen with acute awareness to hear the unfamiliar dialect of her silence fairly and accurately" (2011, p. 298). I don't mean to imply that wilderness and wildlife are silent. Rather, I make the connection that technology can help us practice listening, especially to performances that are often inaccessible. Listening to performances and recognizing surfaces as places of meaning-making are central to this dissertation. AR and VR began standing out to me for their unique ability to express difficult concepts; particularly, they stood out to me as listening tools.

The growth of AR and VR has recently made both forms of media, and the technology that creates them, much more accessible. Oculus Quest from Facebook (now the Meta Quest from Meta) has sold an estimated 10 million units of the Quest 2 (Gartenberg, 2021). Not only is this an impressive number, but it doesn't even account for their previous Oculus Quest devices (one of which I still use). These 10 million sales of their newest device make up just some of the sales that now constitute a majority of

the VR market. Meta has moved from controlling more than a quarter of the VR market to three fourths ("Oculus Quest 2 Cumulative Sales Hit Record 4.6 Mn," 2021). Meta is also currently developing their AR technology, though they have not announced what it will look like yet. To create this combined AR and VR device, they are investing 10 billion just this year to build out their metaverse (Kastrenakes, 2021). The existing markets for AR and VR are large, and only projected to grow. In a recent market analysis report from Grand View Research, the global AR market was valued at 17.67 billion USD, and it is forecasted to expand at a compound annual growth of 43.8% through 2028, putting the revenue forecast at 340.16 billion USD (*Augmented Reality Market Size & Share Report, 2021-2028*, 2021). In another market analysis report from the same company, the global VR market was valued at 15.81 billion USD, and it is forecasted to expand at a compound annual growth of 18% through 2028, putting the revenue forecast at 69.6 billion USD (*Virtual Reality Market Share & Trends Report, 2021-2028*, 2021). AR and VR are not niche anymore, and tech giants with questionable practices (at best) are leading their mainstream development.

Even with tech giants like Meta leading the way, apps and other software are emerging from other companies, including small crowd-funded organizations. Some of these apps take bold leaps into AR and VR design while trying to educate users about environmental topics. *Safari Central*, funded as a Kickstarter project to support conservation, is one such AR app. It allows users to take photographs with six different "real animals" and "rewild" their world with them. This invitation to rewild, or reconnect, with wildlife through a simulation is evocative. Rewilding is a term with a rich history,

which I will address more later in this chapter, but in the case of *Safari Central* (and this dissertation), rewilding means reconnecting with wildlife through digital media. Internet of Elephants, the company who created *Safari Central*, later leased the AR app *Wildeverse*. *Wildeverse* is much more complex, featuring objectives, a chat log, a journal, and many, many objects to find and collect. It also links users to statistical information about their actual location such as air quality. Even with all these added forms of engagement, *Wildeverse*, like *Safari Central*, tasks users with taking photographs and scans of supposedly "real" animals. This photography mechanic isn't limited to AR: National Geographic's app for the Oculus Quest, *National Geographic: Explore VR*, lets users visit the Antarctic and Machu Picchu to take pictures for research and National Geographic Magazine.

Photography and camera-use is an interesting mechanic for AR and VR wilderness apps because nature photographers (including hobbyists) are often self-motivated to engage with natural environments, visual media, and scientific education, using photography to teach public audiences about local flora and fauna (Ohara et al., 2019). In this case, it is the practice of photography as much as the photograph that engages people with their environments. For the photographer, the practice of photography is a generative experience that helps them gain and convey scientific and personal understanding. What is particularly interesting about the apps mentioned here is that they present an augmented or completely simulated view of nature and then prompt the user to capture it in a photograph. Instead of passively consuming nature photography, the viewer becomes the photographer. Similar to how nature photographers

self-educate and teach public audiences, these apps also provide educational content and prompt readers to care about their subjects. The difference in these apps, however, is that instead of trying to *convey* a personal experience, they attempt to *create* one. These personal experiences are designed to communicate scientific and technical information while attempting to facilitate care.

While there may be many reasons why connecting with wildlife and wilderness through personal and scientific understanding is important, it is especially so as environments experience degradation. *Safari Central*, *Wildeverse*, and *National Geographic: Explore VR* all include wilderness and wildlife that are experiencing the effects of serious destruction and degradation. These apps educate users and prompt them to care about, and sometimes for, their subjects. However, the ethical consideration of design has largely ignored representations of the environment, especially as it may intersect with facilitating care for wilderness and wildlife that is experiencing the effects of habitat destruction and environmental degradation. Some studies have discussed framing through narrative (S. J. Ahn et al., 2015) or the importance of matching natural settings with corresponding audio (Annerstedt et al., 2013), but we lack a critical discussion of how natural environments and wildlife are selectively captured through video or created through CGI and how these designs fit specified goals. In this dissertation I begin to develop this discussion.

To begin a discussion about how wilderness and wildlife are selectively created in CGI, I draw from care ethics, new materialism, and feminist materialism. I apply these theories to both the affordances of AR and VR technology and the experiences presented

on the surface of these app's screens, which include representations and photography of wilderness and wildlife. Probably the most popular scholar of photography, Susan Sontag (1977, 2003, 2004), examines how the camera and photography work as sites of violence. However, *National Geographic: Explore VR*, *Safari Central*, and *Wildeverse*, which uses photography and the camera as a central form of engagement, prompts users to care about (and sometimes for) wilderness and wildlife through education, conducting research, donating money, and change buying habits. Noting this divergence from much of photography-centered rhetorical studies, I came to two research questions:

- RQ1: What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?

- RQ2: How can these designs be revised or leveraged for more beneficial environmental communication through care ethics?

I answer these research questions using methods from game studies and a methodological lens informed by care ethics, new materialism, and feminist materialism. In this chapter I introduce these theories that are developed in more detail in later chapters. In the first major section, I introduce the intersection of environmental communication with AR and VR. For me, this intersection is framed by rewilding and care ethics, so I answer the question: *What does it mean to rewild with AR and VR?* In the second major section, I introduce other theories that intersect with my research questions, including new materialism, feminist materialism, and analyses in games scholarship. I conclude this introduction chapter by outlining the structure of this dissertation.

**Rewilding with AR and VR**

The terms wilderness and *wildlife* are used in many ways with varied, specific definitions. I am using the terms wilderness and wildlife without the implication of strict binaries of purity or certain kinds of nature. I use the terms wilderness and wildlife cautiously throughout this dissertation, hoping to retain their practicality without implying that humans are separate from nature or that nature needs to be completely separate from humans to be considered 'wild.' I choose to use these terms because they align with the project's central theme of rewilding. Rewilding is a term that comes out of conservation science, and within that realm it is a specific practice of reconnecting previously connected tracks of land so that large predators can have large enough swaths of land to hunt (Bekoff, 2014, p. 9). Although rewilding may seem paradoxical because the "wild" is managed by human control, it loses much of its contradiction when the word wild is not taken to mean "without rules or human involvement." Instead of removing rules, conservational rewilding is about connecting small areas where human influence is minimal and then imposing rules to limit human influence, not remove it entirely. Following this central thread, Marc Bekoff presents the notion of rewilding our hearts as something focused on (re)connecting and caring. I follow Bekoff's definition of rewilding in this dissertation, and I respond to his call (2014) to rewild media.

Rewilding media may sound ambiguous, but it simply means to support rewilding with media. Popular environmental media, such as documentaries, have largely over-represented violence and ignored how animals spend much of their time resting, sharing resources, and cooperating with each other (Bekoff, 2014). Though popular

environmental media may educate users, they also often distance users from wilderness

and wildlife by highlighting traits that viewers do not want to identify with, such as

aggression, sexuality, and silliness. Rewilding media means prioritizing representations

of animals that present them as more holistic creatures that people can connect with and

feel care for without over-identifying (which usually involves erasing the qualities of

other animals to seem more human and relatable).

        To better engage with what it could mean to rewild media, I apply care ethics. In

particular, I follow Maria Puig de la Bellacasa's (2017) and Alexis Shotwell's (2016)

theories of care and purity. Puig de la Bellacasa writes about the importance of

reclaiming care from its "tendencies to smooth out its asperities" through idealizing or

denigrating, writing: "Reclaiming is here all but about the purging and 'cleaning' a

notion; rather, it involves considering purist ambitions—whether these are moral,

political, or affective—as the utmost poisonous." Similarly, Alexis Shotwell argues that a

purity approach is counterproductive because "it shuts down precisely the field of

possibility that might allow us to take better collective action against the destruction of

the world in all its strange, delightful, impure frolic" (2016, pp. 8–9). Following the

works of these scholars, care ethics includes recognizing that humans are complicit in the

destruction and harm of other species and environments. While not all people are

complicit in the same or equal ways, there is no purity through care or otherwise.

Recognizing that there is no purity prompts us to grapple with caring for others and

ourselves even as we are complicit in harming others and ourselves. For a working

definition of *care*, I turn to Donna Haraway. Haraway writes that "caring means

becoming subject to the unsettling obligation of curiosity, which requires knowing more at the end of the day than at the beginning" (2013, p. 36). This definition includes uncomfortable (unsettling) feelings and situates the caregiver as a listener.

I have chosen to focus on how to rewild with AR and VR because these forms of media are particularly well suited for addressing certain environmental communication challenges. Fauville et al. (2020) explain that environmental crises pose considerable communication challenges, including incorporating first-hand experiences, experimenting in specific environments, providing visuals for typically imperceivable phenomena, and bridging the spatial and temporal distance between people and places. AR and VR are well suited for overcoming all of these challenges because of their unique affordances. Shared affordances between AR and VR include diminishing negative aspects of the physical world, enhancing positive aspects of the physical world, recreating existing aspects of the physical world, and creating aspects that do not exist in the physical world (Steffen et al., 2019). I want to be careful not to make AR and VR seem grander than they are. I am not positioning them as the solution to environmental communication challenges that will solve our deeply entrenched ecological problems. However, I do see AR and VR as a tool for addressing certain problems in unique ways, which may present an alternative form of visualization and persuasion that is, for some, more understandable, interesting, and moving.

Many organizations have turned to AR and VR to help foster understanding and care. Some examples include Stanford's Ocean Acidification Experience, which teaches users about ocean acidification with visually immersive communication (*The Stanford*

*Ocean Acidification Experience*, 2020); Conservation International 360-degree videos

series, which shows stories of people and environments that are difficult to access

(*Conservation in Virtual Reality*, 2020); Animal Equality's 360-degree experiences,

which show the experiences of animal agriculture and slaughterhouses from farm animal

perspectives (*Animal Equality*, 2016); and Project of The Mind Museum's companion

app to the children's book *What is Nature? Everything is!* (*What Is Nature AR-Book*,

2022). As AR and VR become more affordable, a closer examination of these media and

their rhetorical appeals is important for future environmental communication.

       As the examples and affordances above show and explain, AR and VR make

wilderness and wildlife more accessible. Accessibility works in several ways here,

beginning with the most obvious: virtual encounters are the most financially accessible

for people who want to see places outside of their location. Immersive media experiences

range from free to several hundreds of dollars for consumer equipment, but even high-

end machines are less expensive than cross-country or international travel. Physical life

expeditions to anywhere outside someone's local area requires considerable money, time,

and resources. For those fortunate enough to be able to afford physical life expeditions,

the environmental impact of tourism may be an ethical barrier; virtual encounters are

often the most ethical way to visit ecologically sensitive wilderness and wildlife. For

example, arctic tourism has contributed significant pollution to an already damaged

ecosystem (*If Seeing the World Helps Ruin It, Should We Stay Home? - The New York*

*Times*, 2019). Finally, immersive media makes wilderness and wildlife more accessible in

relation to physical abilities and disabilities. For example, in *National Geographic:*

*Explore VR*, the user ice climbs in the Antarctic, something outside of my own (and probably most users') physical abilities. Or, in *Safari Central* and *Wildeverse*, users come into close proximity to dangerous animals, which may be a risk that users are not comfortable taking with their own health and lives.

**Connections Across Topics and Scholarship**

This dissertation includes layered discussions of theory and technology, which requires introducing how environmental communication in AR and VR relate to other major topics and theories I present in this dissertation. Because I analyze what kind of relationships are facilitated by designing around photography and a camera in AR and VR apps, I must recognize the unique affordances of AR and VR as well as engagement mechanics from videogames. This recognition requires pulling from studies in AR research, VR research, app design, and videogame design. Based on this analysis, I suggest approaches for how to revise or leverage AR and VR app designs by applying care ethics. Bekoff's rewilding is about care and connection, and I apply care ethics as an ethical framework to bolster this goal. Working within this ethical framework, I draw from new materialist and feminist materialist scholarship to recognize how materials act as/with/on users of these apps. This framework influences my methodological lens as well as my method for collecting results, which I discuss in more detail in chapter three where I dedicate space to connecting different theory and scholarship. Before addressing theory, the next chapter is dedicated to addressing technology so that *what* I apply theory to is clearer. However, in this section, I will briefly introduce new and feminist

materialist scholarship, major topics in videogame studies, and how these two areas inform each other in this dissertation.

*A New and Feminist Materialist Lens*

I draw from new materialist and feminist materialist scholarship because it provides a way to consider nonhuman actors in assemblages as well as a way to destabilize human and nonhuman binaries and barriers. In these AR and VR apps, assemblages exist primarily between humans and material. However, wildlife is still present in this assemblage, inspiring representations and ultimately bearing the consequences of the product's persuasion, for better or for worse. Though I am not focusing on gender in my analysis, my new materialist lens is largely influenced by feminist materialism. Feminist materialism provides useful scholarship on bodies as actors and critique on how some surfaces, particularly screens (Anable, 2018), have been culturally coded as feminine. Feminist materialism is also inherently related to environmental ethics. Stacy Alaimo addresses this inherent relatedness, writing:

> Acknowledging the agency of all that is not human affirms the need for places—
> urban, suburban, and especially 'wilderness' –in which the 'doing/being' of
> creatures, ecological systems, and other nondiscrete lifeforms can flourish. In fact,
> one of the most fundamental values of environmental ethics—the value of the
> 'wild'—can be understood as nature's ongoing, material-semiotic intra-actions—
> actions that may well surprise, annoy, terrify, or baffle humans, but that
> nonetheless are valued by environmentalists as the very stuff of life itself (Alaimo
> & Hekman, 2008, p. 294).

The acknowledgement is meant to provoke a better understanding of actant power, decentering humans without removing responsibility. As Jane Bennett, a new materialist scholar, explains in *Vibrant Matter*, "the political goal of vital materialism is not the perfect equality of actants, but a polity with more channels of communication between members. […] How can humans learn to hear or enhance our receptivity for 'propositions' not expressed in words?" (Bennett, 2001, p. 104). Learning to hear propositions not expressed in words seems like an apt description of how environmental communication in AR and VR attempts to facilitate care and education for wildlife.

There are similar approaches in rhetorical studies that share common ground with new materialism and feminist materialism, such as object-oriented ontology (OOO). I choose a new materialist lens that is informed by materialist feminism because these approaches consider context much more than OOO. In *Feminist Rhetorical Science Studies*, Kyle Vealey and Alex Layne explain that OOO flattens matter to the point where all matter is decontextualized. They write that "to raise the ontological status of an object to that of a human asserts that there is some sort of demarcation, or solid boundary, between them (Vealey & Layne, 2012, p. 66). Decontextualizing any matter erases its place in the world, its connections, and its capacity for vulnerability and power based on those connections. Vealey and Layne write that "these consequences may not show up for philosophers, as they are often trying to define the world as it is, but they do show up for rhetoricians, who attempt to identify the effects of different ways of being in the world" (2012, p. 63). I use this description of what a rhetorician does—identifying the effects of different ways of being in the world—as an imponent concept. In this dissertation I seek

to identify how representations in AR and VR operate within and develop new, unique ways of being in the world.

New materialism and feminist materialism also provide a way to think about the bodies that experience physical immersion in AR and VR. In a critique of rhetorical situations more generally, Jenny Edbauer (later Jenny Rice) writes: "although the standard models of rhetorical situation can tell us much about the elements that are involved in a particular situation, these same models can also mask the fluidity of rhetoric. Rhetorical situations involve the amalgamation and mixture of many different events and happenings that are not properly segmented into audience, text, or rhetorician." (2018, p. 20). The amalgamation of the rhetorical situation in AR and VR includes a greater reliance on both technology and user bodies. As Jenny Rice writes in another article, "rhetoricians do not merely make voices heard; we are also on the lookout for ways to create new capacities for engagement." (Walsh et al., 2017, pp. 436–437). A new materialist lens brings other actant powers to the table, considers how these material experiences shape our perceptions, and looks for new capacities.

*Videogame Studies*

I also draw from game scholarship to inform my analysis for several reasons. First, many AR and VR apps *are* games, and the ones that are not still often use the same software to design playful interactions. Several key commonalities between all videogames and all kinds of AR and VR (game or otherwise) allow for easy adaption of games scholarship. One of these is increased interaction: even the most passive AR and VR experiences require the user to choose where to look, thus requiring the user to make

choices about how they consume the media. Another is how increased interaction is facilitated: AR and VR sometimes incorporate objects for their simulation that users can interact with in similar ways to a videogame. The camera is often a feature of games, but in some games, it functions as a primary mechanic. However, not much attention has been given to the representations that photography captures in video games. Instead, video game scholarship has largely focused on the procedures in games.

Ian Bogost defines procedural rhetoric as "the practice of persuading through process in general and computational process in particular" (Bogost, 2010, p. 3). This theory does not focus on specific representations, images, videos, words, or other content, but how processes persuade. Of course, all computer programs are procedural, including the Word processor with which I write. Explaining how videogames are different from procedural rhetoric, Bogost writes:

> While 'ordinary' software like word processors and photo editing applications are often used to create expressive artifacts, those completed artifacts do not usually rely on the computer to bear meaning. Videogames are computational artifacts that have cultural meaning as computational artifacts. (Bogost, 2010, p. ix)

While Bogost's procedural rhetoric provides a useful framework for when user observation is limited or absent, its reliance on authorial intent and its lack of user observation creates significant limitations. In Miguel Sicart's article "Against Procedurality" he explains:

> This understanding of games, however, fosters the idea that to design ethical or political experiences through games is to codify arguments in the game system.

When playing by those rules, players will be ethically or politically affected, or

persuaded. […] If it is in the rules, it is what the game is and means, therefore

preserving the designers' authority and a relatively unidirectional communication

model, hence the aforementioned importance of author statements in the work of

some independent developers. However, this model takes away the importance of

play and players in the configuration of the ludic experience. (Sicart, 2011).

Underestimating the generative power of play and players is dangerous: it allocates far

too much authority to the author and easily ignores unintended interactions and

consequences. Yet, Sicart does not move far from procedural rhetoric. Sicart argues that

"the importance of procedurality in games studies cannot be denied. It is still a

perspective that is fruitful, and that helps us anchor experiences and actions in

technologies and objects" (2011). For a closer look at how representations create

meaning in games, Andrew Reinhard and Aubrey Anable present surface-oriented

analyses.

Andrew Reinhard (2018) discusses games as artifacts in his book *Archaeogaming*,

which allows for surface-level interpretation of videogames. Reinhard defines

archaeogaming as "the literal interpretation of games as sites, built environments,

landscapes, and artifacts, no different than any place on Earth that has been manipulated,

managed, and transformed by people past and present" (2018, p. 1). He goes on to

explain in more depth, writing:

All video games are archaeological artifacts. […] A more contemporary approach

to artifacts sees them as independent of age, of no particular time, part of a past

that persists in the present, mundane in their creation and use, physical or virtual,

or special not only in their manufacture (either by people or machines) but also by

their relationship to a greater context of personal ownership and interaction with

people and with other things, part of a chain of their histories of use. (Reinhard,

2018, p. 30)

This theory lets us think about games, their in-game objects, and extra-game objects as

artifacts that can teach us about our cultural development from surface representation.

However, I do not always agree with how Reinhard assigns cultural development to

certain attributes. Using archaeogaming, Reinhard compares how archaeologists look at

Greco pottery to how we might look at the pottery in the *Elder Scrolls* games. He notes

that Greco pottery advances with finer powder and more intricate designs, and so does

the pottery in Elder Scrolls. He then takes this example and tries to apply it to games as a

whole. I find this example problematic because it considers photorealism a definitive sign

of development. As Mia Consalvo (2016) notes in her book *Atari to Zelda*, the obsession

with photorealistic graphics is largely a Western phenomenon.  Following Reinhard's

logic, we might think that the more photorealistic designs of western games are somehow

more advanced, but this simply isn't the case. Rather, it is matter of cultural preference.

Reinhard does have a point when he writes that "players can tell roughly when a

game is produced, typically by its graphics" (49). Even in more minimalist design, we see

more refinement the simplicity of new games or iterations of games. However, I again

disagree when he says that retro games such as Minecraft "should be viewed as separate

from this kind of record, almost like intrusions into gaming strata" (49). Rather than see

these as simple intrusions, we can look at how they indeed operate in different ways than true retro games. For all of Minecraft's low-resolution graphics, it's not a game that a retro, 64-bit machine could run. To illustrate its complexity, "it's agreed that in a completely flat Minecraft world it would take a player eight hundred and twenty hours of continuous walking to reach the edge of the universe" (Parkin, 2014). That is over 34 days of continuous walking, not taking into account any breaks. Other low-res games that are much smaller are designed with decades of game design and coding behind them, utilizing more advanced infrastructure for different kinds of connectivity and materials. Looking at these kinds of games as intrusive strata ignores so many other ways to appreciate how these games are differently informed, designed, and created.

Rather than treat representations in videogames (and apps) as historical artifacts, I am seeking to understand what kind of relationships are facilitated between users and those representations. Reinhard's approach is certainly useful for other inquiries because it provides a way to look at surfaces rather than simply procedures, but Aubrey Annabel's approach is more appropriate for answering my research questions. Aubrey Anable (2018) applies feminist and queer methodologies, mostly drawing from Karen Barad and Sarah Ahmed, to question whether researchers need to go beyond the surface of games into the code, ludic constructions, or elsewhere. Where she differs from Reinhard is her approach to surfaces. Anable (2018) invites researchers to apply game analysis to study the everyday entanglement of a material surface as a space of representation and an affective assemblage. She recognizes how the binaries of surface/depth, representation/computation, and hiddenness/revelation have devalued these everyday

assemblages. She does not wish to collapse the screen into the skin. Rather, she wants to draw greater attention to what is *sensible*—what we can touch and feel.

Anable's attention to what is sensible has interesting applications for AR and VR, where the sense of self or world is fundamentally altered. Notably, many VR apps have moved towards recognizing hand gestures instead of relying on controllers. Though users may be grasping at air, the idea of touching something can be so strong that users often lean their bodies against virtual objects and accidentally start free falling. Anable also includes haptic vision in her consideration of touch. Haptic vision, as constructed by Laura Marks (2002), is a kind of gaze that is drawn to textures, patterns, colors, and multisensory engagement. Though Marks writes about haptic vision related to film, it is especially applicable to AR and VR because these technologies primarily rely of visuality to create illusion and engagement.

Aubrey Anable proposes a model of analysis that "attends to surfaces—of screens and bodies—not as sites of secondary expression but rather of critical sites of touch and entanglement, where representation still matters and representation is matter" (Anable, 2018, p. 64). Anable's methodology for game analysis brings how and why touch and embodiment are important for games to the surface. The methodological approach that she offers, though new to game analysis, draws from feminist materialism and works very well with my research questions and the photography aspect of the games that I am analyzing. Because photography games bring the player's (or user's) attention to the screen of the game (or experience), the surface of the experience is inherently foregrounded and vital to the overall experience. In my later chapters, I pull from other

video game scholarship on educational design, but I return to Anable's method to inform my analysis.

**Conclusion**

In this chapter I have introduced the major theories and topics that inform my research requestions and how I answer them. My research questions are: RQ1) *What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?* and RQ2) *How can these designs be revised or leveraged for more beneficial environmental communication through care ethics?* I answer these research questions using methods from game studies and a methodological lens informed by new materialism and feminist materialism. These topics are addressed and connected in more detail throughout the rest of the dissertation.

The next chapter, *Chapter 2: Designs, Influences, and Applications of AR and VR*, reviews scholarship on AR and VR as well as their intersection with educational games. *Chapter 3: Popular Environmental Media and Critical Perspectives* also reviews scholarship, but this chapter focuses on how relationships have been constructed in popular media (usually through more common media, such as photography and documentaries) and how care ethics, new materialism, and feminist materialism can aide in critique. The following chapter, *Chapter 4 Methods: Touch-Modified Game Analysis*, outlines the methods that I have chosen and how I have adapted them to AR, VR, and my research questions. *Chapter 5 Results: Relationships Facilitated Between Users and Representations*, discusses the results from app playthroughs and answers my first research question. My second research question is answered in *Chapter 6 Discussion:*

*Care Ethics for AR and VR Designs*, where I present three approaches for revising

photography-centered AR and VR apps that seek to facilitate for wilderness and wildlife.

The final chapter of this dissertation is *Chapter 7 Conclusion: Looking Forward for*

*Industry, Pedagogy, and Future Research*, where I address how the work from this

dissertation may aid to industry designers, other instructors, and inform my future

research.

CHAPTER TWO

INTERSECTIONS WITH AR AND VR:
DESIGNS, INFLUENCES, AND APPLICATIONS

In Figure 1 (below) you can see one of my dogs staring out the window, unaware

of the animal I had placed near him in the AR app *Safari Central*. While he was focused

on finding wildlife beyond our home's window, I was focused on framing him with

"wildlife" within my phone's window. *Safari central* is one of the three apps I will

analyze in chapter five, but I present this photograph now to show how different forms of

media that I will discuss in this chapter converge in this app. The convergence I am

interested in here is physically immersive media, videogame design, and photography.

These three areas are usually separate areas of study, and without this convergence in

mind, it can feel disjointed to look at them together. When I first began this project, I

found myself trying (with some frustration) to explain how they all came together

without becoming too entrenched in any one discussion or too quickly jumping between

disparate ideas. It was clear in my mind how these different subjects connected because I

always had images like this one guiding me.

Figure 2.1: An elephant in *Safari Central* next to a dog

I also look at this image and think about animal representation and potential impacts on actual animals. That discussion will be taken up in the next chapter when I address critical theory about and relevant to environmental communication. This chapter is instead dedicated to discussing different forms of physically immersive media, technologies that enable them, and how they are particularly well suited to environmental communication for public audiences. I also address in this chapter how forms of physically immersive media, specifically AR and VR, have developed in ways that are relevant to their convergence with photography and videogames in the apps I am studying. Putting these three topics—physically immersive media, photography, and videogames—together into a scholarly discussion is itself a unique contribution to that may be of growing importance as the popularity of game-influenced photographic AR and VR rise. For this dissertation, this discussion is necessary because the apps I study use the camera and photography as an engagement tool in AR and VR apps that convey scientific and technical communication about wilderness and wildlife.

In *National Geographic: Explore VR*, users embark on two different assignments, one in the Antarctic Peninsula and one in Machu Picchu. Both assignments are centered around the task of capturing photographs and include voiceover narration that teaches the user about the place (Figure 2.2 below). This app relies on the user's desire to engage in exploration and respond to tasks in ways that are similar to videogames. In *Safari Central*, users engage with AR animals in playful ways, positioning them around their world and with themselves. Users often pose these animals and themselves in silly, *playful* ways, which can be seen in collage of featured photos from the app's website in Figure 2.3 below. In the next app from Internet of Elephants, *Wildeverse*, users engage with wilderness and wildlife by scanning them and taking photographs of them in AR (Figure 2.4 below). This app leaves room for less silliness, often touching on serious topics such as practicing conservation in a former conflict zone, wildfires, dangerous air quality, diseases, and the difficult circumstances of various populations across the globe. Yet, this is a true *game* about photography and using the camera, with scores, objectives, and unlockable items. All of these apps are designed in similar ways to videogames and function either like a game or as a game while using photography as a mechanic to

engage users about wilderness and wildlife.
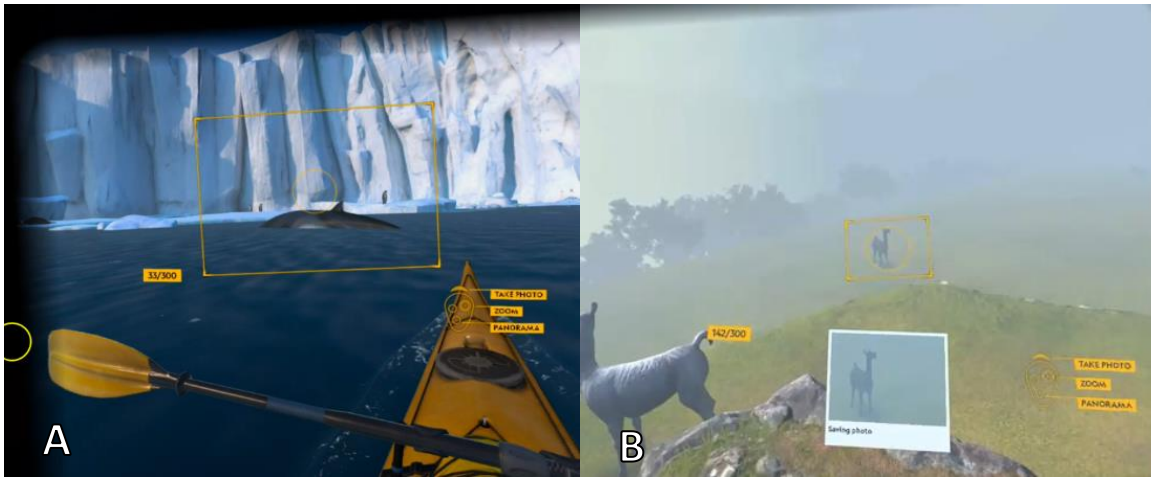


Figure 2.2: Taking a picture in *National Geographic: Explore VR* (image A shows Antarctica and image B shows Machu Picchu)



Figure 2.3: A Collage of user images featured on Safari Central's website

Figure 2.4: Scanning and Photographing in Wildeverse. Image A shows elephant dung that has been scanned. Image B shows a photograph of a termite mound. Image C shows a photograph of an orangutan.

In the first section below, I address defining characteristics of different forms of physically immersive media and their special affordances. First, I discuss competing definitions of AR and VR as well as introducing my own definitions. I then discuss AR and VR separately, addressing their unique developments and affordances. I conclude this first section by addressing their commonalities as physically immersive media and how they are both well-suited to address the challenges of environmental communication. In the next major section, I will turn to videogames and photography. I first address education games, focusing on some ethical considerations within games scholarship and how educational games can be used for educational and social benefits. I then discuss

photography and camera-use in digital environments. This section addresses the development of cameras in digital experiences, photography as a playable mechanic. I conclude this chapter by summarizing the significance of the research presented in this chapter for my research question. In short, I explain that AR and VR have some shared affordances that I will focus on in this dissertation while "minding the gap" between these forms of media. Additionally, the designs presented in the apps I am studying are informed by game design and inherit a complicated history of photography. Since these apps have users engage with surface representation (through photography and the camera), the convergence of these three areas puts surfaces and certain kinds of experience into a privileged position for communicating technical environmental communication and facilitating care.

**Defining AR and VR and Navigating their Affordances**

For some users, the functional definitions between AR and VR may rely on a quick experience with an app like *Pokémon Go!* and pop-culture images of VR head-mounted displays (HMDs). In other words, does the user engage with phenomenon in a way that makes them feel like their world has been transformed? That could be called AR. Or does the user engage with phenomenon in a way that makes them feel like they are in a different world? That could be called VR. However, these experiences present a deceptively simple picture of AR and VR that only reflect their more recent forms. The defining features have changed over time and are easily confused. Jaron Lanier (2017) presents 52 different definitions of VR that reflect different contexts and uses. While Lanier offers many hyper-specific definitions of VR, others combine various kinds of

experiences together under different phrases. In this section, I trace some influential

scholarship and develop my own working definitions that take inter-disciplinary

scholarship into consideration. In short, I argue three things in this section: (i) definitions

of physically immersive media need to acknowledge that there are other ways of creating

presence; (ii) there should be a clear line between replacing and augmenting reality

through digital technology because of how different these experiences are for the user;

and (iii) despite the differences between AR and VR, their shared affordances are

significant enough to warrant studying them together for certain cases. This dissertation

is one of those cases because I trace a line between these technologies based on the

affordances that lend themselves to technical environmental communication.

William Sherman and Alan Craig have coauthored many texts with each other

(and others) on VR, including early and recent books on the subjects. In the early 2000s,

Sherman and Craig defined VR as "a medium composed of interactive computer

simulations that sense the *participant*'s [emphasis original] position and actions and

replace or augment the feedback to one or more senses, giving the feeling of being

mentally immersed or present in the simulation" (2003, p. 13). There are two things that I

would like to point out here. First is that they include augment in the definition of VR.

They later go on to define AR as a type of VR that combines synthetic stimuli with "real-

world" objects. Second, is the key phrase mental immersion. In this text they distinguish

between two different kinds of immersion—mental immersion and physical immersion—

and how they relate to presence. This will be something that I come back to in my own

definition, so I want to give these distinctions attention. Sherman and Craig's definitions for these terms are:

- Immersion: "sensation of being in an environment; can be purely mental state or can be accomplished through physical means: physical immersion is a defining characteristic of virtual reality; mental immersion is probably the goal of most media creators"

- Mental immersion: "state of being deeply engaged; suspension of disbelief; involvement"

- Physical immersion: "bodily entering into a medium; synthetic stimulus of the body's senses via the use of technology; this does not imply all senses or that the entire body is immersed/engulphed"

- Presence: "short for sense of presence; being mentally immersed" (2003, p. 9).

Their definitional work here is useful because it recognizes different kinds of immersion and claims that physical immersion does not need to be complete or engulfing. Mental immersion, the feeling of "being there" is created for both AR and VR through the unique affordance of physical immersion. The term presence here is synonymous with mental immersion. I use Sherman and Craig's (2003) definition in this work, which likely differs from the many, and more nuanced meanings often used in rhetorical studies. While my choice for defining presence is a simplistic it functions well across disciplines and for the purpose of this dissertation.

In a book that came out six years later, Sherman and Craig make a slight change to their definition of VR. They define it as "a medium composed of interactive computer simulations that sense the participant's position and actions, *providing synthetic feedback* [emphasis added] to one or more senses, giving the feeling of being immersed or being present in the simulation" (Craig et al., 2009, p. 1). The significant change here is the removal of "augmentation" and the addition of "synthetic." They still discuss AR in this textbook, but they do not define AR itself. This seems to reflect some hesitancy about the definition of AR without wanting to exclude the subject altogether. This 2006 definition has been carried forward to recent work. In the edited collection *VR Developer Gems*, Sherman cites this definition, stating that he has "adhered to [it] for many years" and continues to do so (2019, p. 3). Similarly, this book still discusses AR without attention to their differences. This update presents several points that deserve attention.

First, I want to present context for the term "synthetic." Synthetic materials, made by chemical synthesis, are found in almost all of the materials we touch on a daily basis, even the clothes we wear. However, the 2006 definition does stipulate that a computer-generated simulation must sense the participant's position. Though this addition gets around the problems that "synthetic" could introduce, I do not know of a contemporary AR or VR experience that is not digital (produced by the digits 0 and 1 as signals or data). Perhaps Sherman and Craig avoided the term *digital* because early AR and VR are often cited in analog computers. The earliest recognized AR system was used in WWII to project radar information onto the windshield of fighter planes so that British pilots could

easily determine whether another plane was a threat (Azuma, 1997, p. 213). The earliest instances of VR vary more widely and depend on the definition of VR.

Some scholars trace VR back to when the term was adapted in 1958, which was translated from the French phrase "la réalité virtuelle" to explain the illusionary nature of characters and objects in theater[1] (L. Evans, 2018, p. 8). Sherman and Craig go back farther to when the first flight simulator was created in 1929. Other scholars recognize VR experiences predating computers altogether, referencing the 1793 Leicester Square panorama that featured a two panoramas (10,000-square-feet and 2,700-square-feet) so that users could walk around a realistic setting (Greengard, 2019, p. 10). While I do see the inclusion of these technologies as useful for a discussion on the development physically immersive media, I do not include them in my analysis because these technologies are not represented in modern technology. Stipulating that VR must be computer-generated is a useful way of constraining the definition to exclude other synthetic experiences without excluding analog computers.

One weakness of Sherman and Craig's 2006 definition is their lack of a distinction between AR and VR. Their 2006 definition leaves room for AR to be grouped into VR without explicitly stating it. Early AR was much more similar to VR because they both used an HMD. It is worth noting that both of the AR apps I am studying in this dissertation are handheld AR, not HMD AR. Regardless, I still argue that there have

---

[1] If this seems too far away from VR, it is important to remember that other scholars argue there are more similarities between VR and immersive theater than other screen-based media such as movies (Bosworth & Sarah, 2019; Bucher, 2018).

always been significant differences between AR and VR that make them fundamentally different. Looking to scholarship from the 1990s and early 2000s, it is apparent that scholars wrestled with defining a newly emerging digital technology. Similar to Sherman and Craig, an early survey of AR defines AR as a subset of "virtual reality or virtual environments" (Azuma, 1997). This was, apparently, before virtual reality would come to express a specific kind of experience. Virtual environments now usually express a broad range of digital environments, such as PC games, console games, or database visualizations. The interchangeability of virtual reality and virtual environments is telling of how these terms were very much in flux as technology was emerging. Azuma (1997) noticed a reliance on defining AR with its use of an HMD and presented a competing definition. He defined AR as having three components: "1. Combines real and virtual 2. Is interactive in real time registered 3. Is in three dimensions" (1997). This includes the AR experiences we now have on our phones and those on HMDs. However, this strangely disqualifies the British's early AR in fighter planes. More concerning, his use of "virtual" as a defining term raises a lot of questions.

A lengthy discussion of the term "virtual" spanning Plato, Bergeson, Deleuze, and other philosophers is not necessary here, but I do want to address how Rob Shields (2003) has summarized their discourses and proposed a unified, four-part definition. He proposes that the virtual is an "ideal but not abstract, real but not actual" and that it is "ideally real, like a memory" (2003, p. 43). The virtual is a real thing. It exists; it is not just a possibility. As an ideal, it is not the actualization or embodiment. Shields explains that computers are one way of actualizing the virtual, and that they do this by providing

perspective or frames through which we pose and understand problems. Other examples

of this can be found in social rituals. Shields claims that rituals were developed to

"invoke and manage virtualities, integrating them into life as carnivals, sacred times and

places, and mysteries" that were "easily mistaken as concrete [actual] in some cultures"

(2003, p. 44). And so, digital virtualities are just one kind of actualized virtuality. This

presents problems for Azuma's definition of AR. However, if we replace "virtual" with

"digital" (which it is often an adequate replacement), then we exclude the earliest

instances of AR on analog computers. Returning to Sherman and Craig, "computer-

generated feedback" seems to be the most accurate phrasing.

Though I think that Sherman and Craig's definitions of AR and VR need

updating, I have chosen to return to these texts because of the way they approach

immersion and presence. Their approach to these two key terms allows me to trace

physically immersive media without displacing other kinds of (mentally) immersive

media. Recalling that early AR used HMDs, there is some argument that users enter

bodily through it. However, users still do not go "into" anything. Users do not enter a

different space when they put on an HMD AR. They experience the same world—just

augmented. However, AR does still rely on physical immersion to (at least partially)

create mental immersion (presence). Bringing this definitional work together, I define

physical immersion to be "bodily engaged with computer-generated feedback that

augments or replaces the user's sense of the world." This definition also makes room for

other forms of extended reality (XR), which include many (and sometimes combined)

forms of altering reality with digital technology. It is important to recognize a common thread between different XR, physical immersion, without collapsing them into VR.

Distinguishing between mental and physical immersion is important for parsing out XR—an umbrella term usually applied to virtual reality, augmented reality, and mixed reality—from other forms of "immersive" media. XR communities, then and now, have often combined mental immersion and physical immersion into the term presence. This turns presence into the something only accessible to XR experiences. An alternate term for XR is "immersive media." This is the preferred term from Bosworth and Sarah (2019), who address wide reaching media from 360-degree video to holograms. Their definition is similar to Sherman and Craig's idea of going "into" the medium. They consider immersive media to be anything that makes the viewer (not user) feel like they are "inside" a story (2019, p. 15).[2] Though I am also tracing a common line between AR and VR, this definition does not work well with other media scholarship. There is far too much work inside and outside of academia that discusses media-generated feelings of being immersed to claim this as a defining term for AR and VR specifically. In other media scholarship, immersion is taken to mean mental immersion, and it is more or less synonymous with presence. Bosworth and Sarah's definition of immersive media disregards a long-standing acceptance of immersion as meaning mental immersion. Most, if not all, media seeks to be mentally immersive. It is important to recognize that physical

---

[2] Bosworth and Sarah both come from a Journalism background, so it makes sense that their users are constructed as passive viewers. However, given the level of engagement that physically immersive media demands, I think it is much more accurate to use the term user or player.

immersion is in service to mental immersion. Creating physical immersion for the sake of physical immersion leads to gimmicky content.

The term physically immersive media better highlights the common thread of XR without dismissing the mental immersion of other forms of media. Keeping this in mind, I also present the following definitions of VR and AR.

- Virtual Reality (VR): A physically immersive piece of media that replaces the physical world with computer-generated content.

- Augmented Reality (AR): A physically immersive piece of media that augments the physical world with computer-generated content.

I have chosen not to include body-tracking in either of my definitions because there are exceptional cases. For example, if a 360-degree video does not track a user's head position when it is on a desktop but does do so when played on an HMD, does the medium change? I argue that only the experience of the medium changes—the degree of physical immersion. Physical immersion is not a complete or engulfing experience, so it makes room for different degrees. Sometimes called "web VR" or "magic window VR" these 360-degree videos let users switch between a window where they can interact with the video and an HMD. This format makes the content far more accessible for people without HMD, those who may experience nausea, or for those who experience some other accessibility barrier. I recognize that these are different degrees of immersion, but less immersion should not be entirely excluded from VR. I propose these definitions to situate my research in a way that recognizes the place of AR and VR within a wider

media landscape, acknowledge the important differences between the media, and to trace commonalities between them.

The differences, commonalities, and now convergence between AR and VR can be observed in popular technologies. Historically, AR and VR devices have almost always been mutually exclusive. In examples of HMD AR from the 90s, creators saw many practical uses for it. They envisioned military, industrial, medical, and entertainment uses. In one example, software provided visual aids as mechanics looked at the machines they were working through a HMD AR device (Azuma, 1997). This ambitious use of AR does exist, such as in companies like SightCall. Using SightCall, a technician can hold their phone up to a piece of machinery and an expert (that SightCall contracts) can draw visual instructions in an AR interface as they talk to the technician. This is accessible to technicians who may only need occasional assistance when companies cannot justify costs for an HMD. However, most of these specialized solutions originally imagined for AR have largely been replaced with mixed reality (MR). The definition MR is also contested (Speicher et al., 2019), but one common distinction is that MR's digital content can recognize the boundaries of actual objects so that a digital object can be obscured by an actual world object, such as a simulated animal partially obscured by an object so that it appears to peering out from it. Some scholars place this between AR and VR on a spectrum from "real" environments to "virtual" environments (Hinske et al., 2007), and it typically exists as an HMD device. At $3,500 per device, the Microsoft HoloLens is designed and marketed as a specialized MR tool for business, manufacturing, and medicine. The HoloLens is an example of how MR has replaced AR

in industry settings that can afford the price of high-quality HMDs and specialized software.

While workplace-focused HMD AR has been replaced by MR, entertainment-focused HMD AR has not been successful. Arguably the most recent large-scale push for entertainment or multi-functional HMD AR was Google Glass, which failed as a popular product (at least partially) because of locating the interface between users and the actual world. Risks associated with this intrusion were interference between human interactions, alienation from "reality," manipulation by technology, and a cyborg appearance (Klein et al., 2020). Locating an interface between people disrupts gaze and creates distance between users and the actual world. Limiting AR to a phone provides a more socially acceptable boundary for AR. Not only does the handheld format adhere to social boundaries, but it also caters to users projecting experiences onto their own faces rather primarily looking outwards. This has been important for casual or entertainment-based AR. Users of apps like SnapChat and Instagram frequently use facial recognition software to alter their appearance. There are some notable examples of where users want to look out onto the world, such as in *Pokémon Go!*, but by far the most popular use of AR is on the user's own face. Ranging from a subtle make-up filter to comical dog ears, users of popular social media have become accustomed to seeing themselves differently. This would not be possible if AR still operated with an HMD.

However, there is a recent shift toward merging AR and VR into the same devices. For example, The Oculus Quest (now Meta Quest) features cameras so that the user can create a guardian (a digital boundary that warns the user when they approach it)

while looking at their room (a form of AR) to enable their VR device. Greater integration is hinted at in Meta's newer products. Meta is currently developing new AR technology, though they have not announced what it will look like yet (Jean, 2021). Creating this combined AR and VR device, they are investing 10 billion just this year to build out their metaverse (A. Brown, 2021). The future of combining AR and VR is being developed at the time of writing this dissertation.

Finally, it is important to note that, perhaps more than other media forms, there are many ways to draw boundaries between media that plays with a user's sense of reality. I am basing my definition on user experience and decades of scholarship. However, industry professionals are often exploring different ways of creating categories. Stephanie Riggs, a director and producer who has worked on "immersive" experiences for Disney, Google, Facebook, Refinery29, Carnegie Melon, Yale, and NYU presents one example of this. In her "Immersive Technology Cheat Sheet," she presents a "storyplex spectrum" with four categories: reality (real environment), classical realism (photography and video), virtual reality (360-degree content, spatial content, interactive content), and enhanced reality (augmented reality, mixed reality, augmented virtuality, and integrated reality) (Riggs, 2019). While I find her use of terms difficult to work with because they are not critically examined in her text (such as "real environment"), she does reflect industry practices. For example, her term *integrated reality* "aligns the presence of physical 'sets' or haptic input devices with sensory effects experienced in the HMD" but it is not limited to HMD and also includes "live action experiences such as location-based entertainment, immersive theater performances, and escape rooms" that

include "immersive technology" (2019, p. 54). While this is boundary breaking for most scholarship that I have encountered, it is easy to image how these boundaries would indeed break down while working for a Disney theme park. I won't be using these boundary-breaking terms, but I do want to acknowledge the importance of flexibility. It is my hope that this dissertation will offer insights that are helpful to industry, and that may include industry professionals who use different terms than what I have outlined here.

*VR Affordances and Experiences*

Now that I have established the boundaries between AR and VR, I can begin to address their unique affordances and histories. There has been far more research into VR than AR as well as more instances of pop-culture imaginings. I will begin with the more extensive history and research of VR so that the lack of AR research and its potential for the future can be better understood. In this section I lay out a history of VR development and recent research to show that VR has *finally* reached a relative affordability for recreational use as well as find its strength in its ability to connect people to other places and experiences. These experiences can sometimes be unintentionally harmful, but overall, they are designed for entertainment and/or social benefit.

The expectations for VR have often far exceeded commercially available products, which has created periods of excitement and disappointment around technologies that have affected the growth and reception of VR. This is especially true of the excitement around VR in the 1980s and 1990s for consumer-priced HMDs, something that would not be widely available until the 2010s (L. Evans, 2018). While VR was mostly unaffordable, it still loomed large in the cultural imagination. As Evans

describes, VR has been embedded in pop culture as a discursive object, "representing technological progress, the future, and the horizon of human-computer interaction and cultural consumption" (2018, p. 30). Some popular novels and films that centered on VR from this time include William Gibson's *Neuromancer*, Neal Stephenson's *Snow Crash*, Brett Leonard's *The Lawnmower Man*, Kathryn Bigelow's *Strange Days*, David Cronenberg's *eXistenZ*, and the Wachowski sisters' *The Matrix*. While these stories present compelling and important questions about human-computer interaction, they also created incredibly high standards for VR. Actual VR technology is still far behind science fiction imagination.

In a more recent pop-culture imagination of VR, Ernest Cline also sets high expectations of VR depth and quality in his novel *Ready Player One* (2011). Cline sets his protagonist in the near future (2045) where the VR program OASIS offers a place for schools, workplaces, and recreation outside of the effects of war, poverty, and severe effects from climate change. *Ready Player One* presents a popular trope for VR, that it offers an escape from the "real" world in some potentially dangerous or unsettling way.[3] It is, then, with some irony that that while VR failed to become a mass-market success it became an inter-disciplinary research tool at university labs and a critical training tool for specialized professions. It is even more ironic that the AR and VR apps that I am studying are created to educate users about real wilderness and wildlife rather than escape

---

[3] In the ending of *Ready Player One* the book, the protagonist (Wade) decides that he has no desire to log back into the OASIS because the creator of OASIS warned him about wasting his life in a virtual world. In the film adaptation Wade shuts down OASIS every Tuesday and Thursday so that people cannot always escape into it.

from them. Rather than obscure or replace the actual world, these apps attempt to connect users to difficult to access phenomenon. VR is particularly well suited to doing this because of its unique affordances.

Affordance theory situates the user, technology, and design as the focus of analysis because affordances, as Don Norman explains in his book, *The Design of Everyday Things*, are relationships. Often confused with signifiers, he clarifies the difference, writing: "Affordances represent the possibilities in the world for how an agent (a person, animal, or machine) can interact with something. Some affordances are perceivable, others are invisible. Signifiers are signals" (Norman, 2002, p. 18). Affordances are always about the meeting of users, technologies, and designs. This framework "can bridge observations about technology use with our broader understanding of technology at individual, group, and organizational levels" (S. K. Evans et al., 2017, p. 37). As Schrock (2015) explains, affordance theory does not privilege either technological determinism or social constructivism because it instead focuses on a middle ground of interactions between social and technical actors.

Besides trying to take specific perspectives of other people or animals, VR is especially well suited to visualizing phenomena that are difficult to see. Something may be difficult to access because it is in a remote or dangerous location. It may move across different locations. It may be something that always lies outside of human observation. For example, a VR experience by Stanford's Virtual Human Interaction Lab that shows how carbon dioxide moves from cars to the atmosphere, oceans, and then acidifies the shells of pteropods is one of the best examples of this. In another study of experience,

Markowitz et al. (2018) found that understanding and recall of ocean acidification was linked to engagement with and exploration of the virtual space. Fauville et al. (2020) also found that it addressed several difficulties in communicating about ocean acidification. It made something otherwise invisible, visible. Interaction in physically immersive virtual space made unfamiliar ocean depths familiar, and it let users take different perspectives.

Another aspect to consider when looking at the affordances of VR is the user's hardware. VR isn't as pervasive as AR, but it has become much more accessible through web VR, magic window VR, and VR devices that are designed for consumers and competitively priced with gaming consoles[4]. As mentioned earlier, 360-degree video is usually not considered to be *true* VR. For example, John Bucher argues that VR must use an HMD so that users do not have the option to look away from the experience. My definition of VR is broader, but I recognize that there can be significant differences between how users engage with the videos based on whether they use an HMD or not. In a study by Breves and Heber (2020), participants watched nature documentaries through a magic window while others watched though an HMD. They found that people using an HMD had a higher level of spatial presence and that users perceived more direct experiences with nature. In my use of the term VR, it can hold a range physical immersion where a user feels more or less inside of an experience. Magic window VR is certainly on the side of a spectrum where users feel less inside of an experience, but they

---

[4] On each product's respective website, the Oculus Quests 2 is listed as selling for $299, the Microsoft Xbox Series S is listed as selling for $299, and the PlayStation 5 Digital Edition is listed as selling as $399. Notably, these are the less expensive digital-only versions of Xbox and PlayStation hardware, but they require monthly subscriptions to their online services. Oculus Quests 1 and 2 are also digital-only, but they does not require any monthly subscriptions.

can still feel inside of one. Though I do not see the use of an HMD as requirement, it does show that increasing physical immersion can increase presence and perspective taking.

VR is commonly referred to as an empathy machine (Shin, 2018) because it, supposedly, affords so many opportunities to facilitate empathy. Yet, how users may or may not feel empathy in VR is a nuanced topic that depends greatly on who the user is. One of the important things that shapes user experience in VR is age. Young children's experience of VR can be very different from adults. Children are less equipped to differentiate memories of virtual encounters from actual encounters. In one study where children experienced a VR simulation of swimming with whales, many reported days later remembering an actual experience swimming with whales. This holds troubling concerns for using VR for young children (Breves & Heber, 2020). Though the apps I am examining are not rated for teens or adults, the Oculus Quest and HTC Vive both are not recommend for users under the age 13.

The affordances of physical immersion can have positive effects. Beyond being called an "empathy machine," VR is noted for its affective interactions. Riva et al. (2007) call it a "mood induction medium." This kind of affordance lends itself to many different purposes and effects. Nature-based VR can be used to calm patients and promote stress recovery (Nukarinen et al., 2022; White et al., 2018), highlighting the importance of content to create presence. White et al. (2018) showed that the level of presence was higher in anxiety-inducing and relaxing experiences than in ones that were considered neutral. Particularly, the results indicated that "enhanced stress recovery and

parasympathetic activation in the group exposed to the VR nature including sounds, compared with the individuals exposed to the VR nature without sounds, or controls who got to read a popular science magazine" and that "combining multiple sensory (eg, visual and auditory) cues may be important" for therapeutic nature-based VR (White et al., 2018, p. 3006). While research is still emerging, the sensory affordances of VR are promising for creating experiences that support empathy.

In another study on empathy and embodiment in VR, presence and flow were strong predictors of empathy and embodiment (Shin, 2018). Shin notes the importance of tailoring content to users, suggesting that additional narratives can be provided for people that are less empathetic and more sophisticated additional narratives can be provided for highly empathetic people. The idea of tailoring VR experiences to the user may help garner desired effects, but it is ultimately impractical. Even games that respond to user's choices are done so procedurally, not in a clinical setting where the user's existing empathy score is measured. Pragmatizing of empathy building walks a thin line. While VR can be used to show different perspectives and difficult to envision phenomenon, the content needs to have user buy-in. It many scenarios it also important to and avoid presenting a one perspective as *the* perspective (a static perspective) that maps onto many people or across time.

The affordances of VR should not be overstated; people experience empathy in VR differently. In a study by Ahn et al., they found that sensory-rich experiences like VR were more beneficial to people with low-empathy scores than people who already had high empathy scores (2014). Similarly, Breves and Heber write that "immersive media

might help to counterbalance personality traits such as low levels of trait empathy, perspective taking, imagination, and compassion" (2020, p. 351). However, VR can also discourage empathy even when the designers are specifically trying to facilitate it. For example Silverman (2015) found that users who become blind in VR became more discriminatory and less empathetic towards blind people. Silverman explain that this is a trauma response where participants used distancing to cope with sudden blindness. This speaks to strong physical immersion of VR to create presence, and it calls up many ethical questions about how to balance simulations of experiences while avoiding trauma responses.

This balance does not seem to need to exclude distress completely. In a study by Herrera at al. (2018) where participants experienced houselessness in a VR simulation, they found that participants experienced more empathy *and* personal distress immediately after their experience. Afterwards, participants behaved in helpful ways towards people experiencing houselessness. They signed petitions, and weeks later when empathy scores waned, they still held positive views towards people experiencing houselessness. Despite feelings of distress initially, users did not try to distance themselves as a trauma response. Instead, they began using first-person pronouns when discussing houselessness, writing *we*, *our*, and *us*. This suggests that finding a productive level of anxiety may be worth pursuing, as long users are not assumed to have the same responses. This is similar to actual life experiences. In a study by Dean et al. (2018), they found that people with relatedness to nature through enjoyment and comfort were associated with good health, but people with an interest in conservation were associated with depression, anxiety, and

stress. Negative feelings seem to be a natural reaction to negative effects on the environment when someone cares about the environment. Navigating these feelings without causing a trauma response needs to be an important consideration in creating VR experiences.

*AR Affordances and Experiences*

There is far less research on AR, especially in on its ability to facilitate empathy. In their recently published book on marketing in XR, Cathy Hackl and Samantha Wolfe describe empathy and AR as still a nascent field (2017). While they do mention Empathetic Computing Labs and Empathetic Media as companies who are exploring the use of AR apps to help build compassion and empathy, it remains understudied. Similarly, there AR has been less prevalent in pop-culture imagination. That is not to say that there are not notable exceptions, such as Steven Spielberg's *Minority Report*. In *Minority Report*, AR can be observed as a large interface that responds to dramatic motion controls from the film's protagonist. However, AR has become insidious for many people smartphone use in subtle ways that require no motions. From beauty filters to dog ear filters, AR is prolific in the some of the most popular social media platforms, such as SnapChat, Instagram, and TikTok as well as providing experiences who whole AR-dedicated apps. The most notable AR-dedicated app is *Pokémon Go!*, which had 232 million users at its peak in 2016 (*Pokémon Go Revenue and Usage Statistics (2022)*, 2017) and still has over 80 million monthly players at the time of writing this chapter (*Pokémon Go Live Player Count and Statistics*, 2021). AR has become a daily

technology since moving from HMDs into the palms of users' hands, but research has not kept pace with popularity.

However, there still have been significant studies into AR affordances, especially educational or general uses. Dunleavy (2014) examined AR games developed by instructional designers at the Radford Outdoor Augmented Reality (ROAR) project. These apps are similar to the ones that I will examine because they are created for both entertainment and education products that focus on environmental topics. The design principles that emerge from Dunleavy's research are *enable then challenge*, *drive by gamified story*, and *see the unseen* (2014, p. 29). He also notes that these design principles map onto Malone's (1981) key elements of intrinsically motivating instruction, which are *challenge, fantasy,* and *curiosity*.

Applying these design principles helped to make their AR apps more engaging. For example, the ROAR app *Dino Dig* was revised to have fewer actions for each stop, minimizing each location-based interaction from six steps to just two where users learn and then engage with a challenge that leads them to the next location. The design principal *drive by gamified story* is not limited to interactive stories or role playing. It also includes elements that support gamifying these roles, such as scoring systems and fail states to help create an immersive narrative (Dunleavy, 2014, p. 30). The third design principles, *see the unseen*, has interesting implications. It emphasizes the general affordances outlined by (Steffen et al., 2019), but it also situates the screen itself as a lens. Applying a metaphor that is popular within critical design (Perry et al., 2008; Squire et al., 2007), Dunleavy explains that the screen becomes a lens because of how users

show preference for looking at the world through this screen/lens than outside of it. I will return to this design principle (and its underlying affordances) in chapter five, because my method will engage with screens as surfaces, not just something to be seen *through*. This a useful design principle that leverages affordances of AR.

In general, designing for AR affordances includes responding to a user's physical location more than for VR. For example, limiting actions to pace users through their physical world requires an awareness of how users *can* move through their physical world. In VR, users physically move within a small area and virtually move within a large space, so actions do not need to be similarly paced. Another important difference is for how users must choose between surfaces—their phone screen and the rest of the world—and direct their attention accordingly.

*Shared Affordances Between AR and VR*

The differences outlined above are significant and important to consider for future research that is tailored to just one of these forms of physically immersive media. For this dissertation, recognizing these differences in affordances is important for not applying recommendations for both forms of media where do they not overlap. Equally important is identifying where they *do* overlap. Steffen et al. (2019) provide a framework of affordances for AR and VR (combined) and conducted a research study to determine how affordances may be stronger in AR and VR. From this work, they outline four main affordances and sub-affordances (more specific affordances that fall under a larger umbrella term) as well as suggest where new research should be conducted. (Steffen et al., 2019) identify the following main affordances and sub-affordances:

- **Diminish Negative Aspects of the Physical World.**

  Sub-affordances: reducing physical risk, decreasing effects of mental or emotional risk, facilitating additional information, filtering information, reducing resource costs, enabling physically incapable participants, depicting the non-existent, and overcoming space-time linearity.

- **Enhance Positive Aspects of the Physical World**

  Sub-affordances: improving an activity through additional information and using virtualization to filter out surrounding stimuli to focus exclusively on the task at hand.

- **Recreate Existing Aspects of the Physical World**

  Sub-affordances: reducing resource cost for activities that normally require significant amounts of time, exertion, or financial resources; enabling experiences to user groups whose abilities and physical limitations would normally prevent participation in certain activities.

- **Create Aspects That Do Not Exist in the Physical World**

  Sub-affordances: creating objects or environments that do not exist in the physical world and overcoming the limits of space-time linearity.

These general affordances overlap in some areas, such as overcoming the linearity of space-time as a sub-affordance of diminishing negative aspects of the physical world and creating aspects that do not exist in the physical world. However, these sub-affordances do not need to be mutually exclusive.

These affordances lend themselves well to the difficulties of environmental communication. Recognizing how environmental problems are difficult to communicate because of temporal and spatial distance as well as danger and cost, Ahn et al. (2016) conducted a study to find if immersive virtual environments (their phrase for VR) may be useful for addressing these difficulties. They found that their VR experiences were able to simulate perspectives of animals and promote a feeling of interconnectedness between themselves and nature. This is promising for representing problems in the climate crisis, but it needs to be approached with caution. It is important to recognize that any other animals' experiences are not totally accessible to us. Still, this presents a way that we may take compelling perspectives that allow us to create empathy across differences.

**Videogames and Photography**

Many AR and VR apps are also games. For example, Steam (a popular online service that houses games and VR content) currently hosts 6,567 VR titles as of February 2022. Out of those, 5,150 are tagged as *games*. AR games take up a much smaller percentage of all phone apps, but the popularity of *Pokémon Go!* remains a successful example. Scholarship is emerging on how to create educational content in VR. For example, Emily Johnson (2021) recommends communication strategies for VR educational games, which include designing around aesthetics, action promotion, and explicit explanation. AR and VR apps can also borrow designs from games without actually being games themselves. Games share an emphasis on interactivity with non-game AR and VR apps, and they even share software and CGI-assets. In particular, VR has been heavily influenced by the gaming industry. The recent popularity of VR has

been largely due the successes of the HTC and Oculus (now Meta) hardware, which are both positioned as gaming devices.

Out of the three apps that I am analyzing, only one, *Wildeverse*, is a true game. The other two apps lack some game qualities but still contains others while encouraging and supporting playfulness. Jesper Juul outlines six qualities that all need to be present for a something to be a game: "1. a rule-based formal system; 2. with variable and quantifiable outcomes; 3. where different outcomes are assigned different values; 4. where the player exerts effort in order to influence the outcome; 5. the player feels emotionally attached to the outcome; 6. and the consequences of the activity are optional and negotiable" (Juul, 2011, pp. 6–7). It is not my intent to flatten all interactive media into the same category, but to look at how they draw from each other and overlap. This is especially important to consider when thinking about how games teach their users about subjects. Serious games are games that are meant to do more than entertain (H. J. Brown, 2008). They include games meant for education, also called edutainment games, as well as games meant for professional training and advertising.

In the sections below I will first discuss education games, which includes serious games, environmental games, and ethical considerations in game studies. These topics all apply the apps I am studying as well as inform how I will respond to my research questions. In the second section I focus more closely on scholarly discussions of photography. Since *Safar Central, Wildeverse,* and *National Geographic: Explore VR* all try to mimic "real" life with digital technology, both photography in "real" life and in

digital environments are relevant to this discussion. I first address photography in the

"natural" world and then move into digital environments, including videogames.

*Educational Games*

Ian Bogost's notion of procedural rhetoric has been one of the most impactful

ideas in games scholarship, and it is has helped shape how scholars recognize the

educational benefits of games. Ian Bogost defines procedural rhetoric as "the practice of

persuading through process in general and computational process in particular" (Bogost,

2010, p. 3). This theory does not focus on specific representations, images, videos, words,

or other content, but how processes persuade. Of course, all computer programs are

procedural, including the Word processor with which I write. Explaining how

videogames are different for procedural rhetoric, Bogost writes:

While 'ordinary' software like word processors and photo editing applications are

often used to create expressive artifacts, those completed artifacts do not usually rely on

the computer to bear meaning. Videogames are computational artifacts that have cultural

meaning *as* computational artifacts. (Bogost, 2010, p. ix)

Building from this, some scholars recognize the educational benefits of games to

be based in how the player interacts with the rules and patterns of the game. These

scholars look at how games function as puzzles that players need to practice. Practicing

these puzzles means understanding patterns and repeating actions until they master the

game (Kirkley & Kirkley, 2005; Koster, 2013). This is certainly one way that players can

learn through games, but this stance only looks at how games function from a

prescriptive ludological perspective. In chapter four, I will discuss my methods and

methodologies in more detail, including the "ludology v. narratology" debate and push back on procedural rhetorics in favor for feminist materialist approach.

Another influential game scholar, Paul Gee, argues that "the pedagogical 'power' of games resides in their potential to teach through the transformation of student identity" (2003). While this could apply to many types of games, one example is counter-factual games that facilitate shifting identity. In Harry Brown's (2008) book *Videogames and Education,* he discusses how some counter-factual games are applied in K-12 education. Counterfactual games are set in real historical situations and allow players to make decisions that may or may not have been what was chosen in the historical event. This allows players to understand the difficulties in making choices, such as limited information, social pressures, incentives, and unforeseen circumstances. Here the shifting identity of the player helps give insight into what life was like and how historical events shape each other.

Shifting identity also allows players to imagine different perspectives. Counterfactual games have been used to give a top-down view of strategy as well as bottom-up view. This is especially useful when certain historical accounts are absent. Brown gives an example of a game where students play as different characters during the American Revolutionary War (2008). Characters include people whose accounts were not closely documented, such as people who were enslaved. The details of these people's lives are inaccessible, but this format helps students identify with them without details. However, Brown notes that students still needed teachers to help them learn from this

game. Teachers helped students practice interpretation, critical reflection, and moderate in-game discussions.

Counter-factual games are particularly useful when access to a perspective is limited. This game design holds potential for facilitating relatedness to animals whose perspectives cannot ever be fully known. Text-based games like this have already been explored. As a child who spent too much time on Disco Kid's website, I played through their game where you are promoted to make decisions as a shark. This text-based game from the early 2000s does not appear in any Google searches, and I can only hope that exists in a Disco Channel archive somewhere. Though this game seems to be lost to time, it made a lasting impression on me as a child because no matter how many times I played and different choices I selected, my life as a shark ended abruptly. When I chose to investigate a shiny object, I was reeled in by a fisher. When I chose to avoid it, my conservative choice resulted in starvation. I won't argue that this was a game worth keeping on their website, or that unavoidable death should be included in a children's game, but I can attest to the ability of the design to make me feel like I had the perspective of a hopeless shark. Applying the design of counter-factual games is not limited to people.

Serious games reach far beyond K-12 education. In professional settings, games are recognized as a useful tool for communication and instruction. Stephanie Vie (2008) helps introduce games to technical writing. She also references Gee, who explains that players enjoy learning difficult concepts in games because they are immersed and motivated. She writes:

Gee (2005) describes how even – and, perhaps, especially – complex games motivate players to immerse themselves in the gaming environment; as a result, they learn difficult concepts while enjoying the process. The assignment described in this article incorporates Gee's concepts into technical writing pedagogy by embedding usability education in the pleasurable kinesthetic learning process gaming provides. (Vie, 2008, p. 159)

Vie highlights how participation is central to gaming, and that games are useful for learning about communicating in multimodal ways. She even advocates for including non-serious videogames in the technical writing classrooms for activities (Vie, 2008). Since Vie's work on introducing videogames to technical writing, scholars in the field have recognized the value of educating with videogames and in virtual worlds. More than simply being useful in professional communication, Michele Dickey (2005) argues that videogames lead the way in cultivating innovative techniques for interactive design, which can apply to the educational benefits of games and non-games. In one example, she explains that "a parallel between player positioning in gamespace and learner positioning within differing theoretical perspectives of learning can inform instructional design about how to create engaging learning environments" (Dickey, 2005, p. 79). In other words, learning environments can draw from game design to create more engaging experiences.

The engagement that game design can provide is well-suited to environmental education and outreach. Ouariachi et al. (2017) explain that the limitations of non-game media are often a one-way transmission, that lack of contextualization, and an often

negative or alarmist tone. They cite others to explain that these kinds of communication acts often make audiences passive, confused, or apathetic. Videogames are positioned as a potentially more effective kind of media. In their study, they found that the climate change communication games they studied were able to work around the limitations listed for other media. These videogames kept the focus local, made their points memorable, and gave players a sense of agency about climate change.

Videogames can motivate players to complete seemingly boring tasks (Zou et al., 2015). Eco Ego was a flash-based game that helped children understand consequences of everyday behaviors on the environment. Taking that a step further, Zou et al. (2015) designed a mobile game, Eco-Eco, that detected players' behavior and helped motivate pro-environmental behavior. For example, walking a certain number of steps and recycling a bottle had positive results within the game. Though not a piece of physically immersive media, games like this certainly have their place in environmental outreach and education. However, I am interested in how more than just serious games can create connections with wildlife and wilderness.

Michael Sicart is particularly dismissive of moralistic games that communicate a particular message. In Sicart's (2013) book *Beyond Choices*, he focuses on "games we play for fun" and not "serious games, games for change, games for learning, or any other persuasive kind of game" (2013, p. 2). Though the tight parameters of "persuasion" that Sicart lays out may be problematic, the apps that I am studying do rely on being primarily entertaining and thus fit these parameters. They are all apps that someone would play for fun rather than education, training, or prompting critical thought. So, this is an important

area to pay attention to—where non-serious games are persuasive. Thinking about ethical gameplay, he focuses not on how a story branches or who the avatar is, but on how players engage with the story. In his book entitled *Beyond Choices*, he, unsurprisingly, promotes ethical gaming to look beyond choices.

Sicart does not ground "ethical gameplay" in any kind of ethics. Instead, he wants to approach ethics in a "designerly way" (Sicart, 2013, p. 2). Sicart's design-based methodology frames what he can identify as ethical gaming. One way he recommends creating ethical gaming is by disrupting expectations. This is an example of designers knowing the rules well enough to break them for effect (and affect). Sicart describes designing ethical gameplay this way:

Designing ethical gameplay consists of understanding how games operate and how players interact, engage, and learn these systems. It consists of communicating these operations using metaphors that encourage players to challenge their own assumptions regarding the desirability of their actions. In other words, designing ethical gameplay creates a tension between actions and their meaning in a game. (Sicart, 2013, p. 107)

One example that Sicart gives of this is a game that asks if the player wants to commit a morally reprehensible act and then finding out that it is the only way forward in the game (i.e., beyond choice). The game he uses as an example is a war game where soldiers must burn people alive to escape. Sicart sees this as ethical gameplay because it prompts the player to pause and consider morality and complicity.

Though I think that prompting complicitly is important, Sicart's methodology is focused on looking not just beyond questions, but also beyond surfaces of games. Much

of game analysis has been fundamentally focused on looking beyond surfaces, such as within the code, how rules combine to make meaning, or what games say through text and speech. This has moved researchers away from studying representations on a screen and beyond the surface of human touch. Aubrey Anable applies feminist and queer methodologies, mostly drawing from Karen Barad and Sarah Ahmed, to question whether this is necessary and what we might learn from studying surfaces, touch, and affect. She invites researchers to consider whether they need to go beyond the surface of games into the code, ludic constructions, or elsewhere. Turning her attention to the surface of interactions, she already avoids the choice-based approach that Sicart tries to get beyond.

Surfaces are critical to my analysis for several reasons. First, the representations and engagements with representations of wildlife and wilderness are central to my research. Second, AR and VR are physically immersive media. Their physicality creates their unique affordances, and this plays out on surfaces or illusions of surfaces. Third, my research questions are also concerned with how photography functions in these apps. Photographs are most notable for their surface-level experiences. Not only do videogames support AR and VR designs and development, but this kind of game analysis also provides a methodology for examining AR and VR. Game scholarship is important for thinking about AR and VR apps are created and function as interactive media. Game scholarship is only focusing on surfaces more recently, so I also turn to scholarship on photography in the natural world and digital environments to also inform my analysis.

*Photography in "Nature" and Digital Environments*

Environmental media has significant power in educating and influencing publics. For example, nature photography is one of the most influential kinds of environmental media. Appealing to non-experts, individuals and organizations have greatly influenced the introduction of environmental policies through photographs (Cox, 2013). This practice continues as photographs of particular species and habitats are used to garner support for them from public audiences (DeLuca, 2005; Doyle, 2007; Hansen & Cox, 2015). Evaluating the influence of nature photography often focuses on wide-reaching organizations and professional photographers, but it can also include hobbyists speaking to smaller communities and public audiences. Some examples may include nature photography on Instagram, Flickr, and other image-based social networks.

Nature photographers (including hobbyists) are often self-motivated to engage with natural environments, visual media, and scientific education, to teach public audiences about local flora and fauna (Ohara et al., 2019). In a qualitative study that interviewed nature photographers, Ohara et al. found that "most nature photographers actively work to absorb scientific knowledge relevant to their subjects during the preparatory process" and that "a key intent for nature photographers is to convey to the public through images their personal discoveries and intimate understanding of nature" (2019, p. 1066). In this case, it is the *practice* of photography as much as the photograph that engages people with their environments. For the photographer, the practice of photography is a generative experience that helps them convey scientific as well as personal understanding.

What is particularly interesting about the apps that I am studying is that they present an augmented or simulated view of nature and then prompt the user to capture it in a photograph. Instead of passively consuming nature photography, the viewer becomes the photographer. Similar to how nature photographers self-educate and teach public audiences, these apps also provide educational content. The difference in these apps, however, is that instead of trying to convey a personal experience, they attempt to create one. This is similar to other AR and VR experiences that use first-person experiences to try to educate and build empathy for other people. These apps are physically immersive, which give them unique experiential affordances of simulating the *process* of taking photographs.

*Safari Central, Wildeverse,* and *National Geographic: Explore VR* make theory about the practice of photography just as relevant to the user experience as viewing and sharing photographs. Examples of photography in electronic environments includes screenshots, game capture software, and even game mechanics themselves. Photography as a game mechanic is the most similar media form to the apps that I am studying. They both use photography as a primary mode of engagement and rely on computer-generated content to photograph. However, traditional photography is still important to this discussion. Photography in digital environments uses skeuomorphism to create the feeling of using traditional cameras, and these apps are no exception. This is particularly interesting in the app *National Geographic Explore VR* because the frameless, immersive experience reintroduces a frame by putting a (virtual) camera between the user and their environment. These camera frames are not obstructions between the user and their

environment; they are framing user engagement—literally and figuratively. All of the apps use a similar exigence to position users near wildlife and wilderness: take photographs and scans. These is reflected in the interface, what users see on the screen, and the narrative arc of the user's playthrough.

Photography in digital environments sometimes mimics traditional photography to gain legitimacy. Giddings (2013) notes how simulated photography clings to mechanical photography in its lens flare (something a physical lens causes that is often considered an imperfection by professionals) and functions in ways similar to non-simulated photography. Especially because of this skeuomorphism, he recognizes that simulated photography does hold aspects of remediation. However, he warns of overemphasizing remediation, arguing that it will ignore the significant novelty of something new. Giddings explains that one of these new aspects of simulated photography is that there is no material separation of camera apparatus and environment. As a game mechanic, he notes that simulated photography works as a precise snapshot *and* capturing events. The product (a snapshot) and the process (the capturing event) are both equally important when thinking about the player's (or user's) experience. Again, the *process* of taking photographs is equally as important as the photograph itself. This is especially true for thinking about photography frames experiences in VR.

Gidding's description of the photography game mechanic is also useful for thinking about AR and VR games (or experiences). Photography centered-games have two cameras—the players view (created from the physical device) and the game object. The perspective camera is meant to be transparent and immaterial, but VR especially

relies on creating this illusion by enacting first-person perspective and presence. VR is supposed to feel *real*, not through a camera. The user's point of view is the camera. However, AR requires more awareness of using a camera, by holding and moving (usually) a phone through the air.

This is different from how photography in digital environments began. Screenshots were originally designed to produce archival quality records. Notably, the first screenshot device was created in the 1930s to record and reproduce X-Rays and required the use of another device (Gerling, 2018). These images were not easily reproducible but functioned as affordable and useful medical records. It was not until the 1980s that users wanted to record a "constellation" of windows on their screens, from which programmers created the screenshot. Traditional photographs obviously provide archival records as well, but they also have unique perspectives. Screenshots contain no unique perspective and often contain intimate, private information such as dates, times, and other personal details. Winfried Gerling describes the perspective-less screenshot, writing:

A screenshot is precisely this: like the photogram, it is a reproduction on a 1:1 scale. It has no perspective, makes no use of any three-dimensional illusion. It follows no human view even if it is made specifically for it. The framing is often "an arbitrary 'cut within a field of potentially infinite elements.' The screenshot and the photogram, different from the optical photograph, do not appear as selections of potentially infinite elements. Instead, they show an image of elements oriented toward the cut in a specific way, even if the selected cut may be arbitrary. (2018, p. 150)

Gerling considers in-game photography as fundamentally different from archival screenshots. In-game photography is significantly different from archiving a constellation because it captures a specific, central perspective in the game (Gerling, 2018). In-game photography, whether a game is designed around it or not, does show a user's perspective. In-game photography can be revealing about what a player thought was particularly beautiful, surprising, or memorable.

Also looking at photography as a game-mechanic, Poremba (2007) discusses nature-based games, including two of the ones I will be comparing with AR and VR apps (Pokémon Snap and Wild Earth Safari). She notes that Pokémon Snap rewards certain kinds of photographs. Spontaneous photos earn more rewards, as does certain composition, and this constructs a "correct" way of viewing that can be quantified in points. Wild Earth Safari has more camera features (not a simple snap) so that the gameplay is centrally focused on composing photos. She considers these to be useful ways of educating players about photography and creating an appreciation for photography outside of games (2007, p. 55). More broadly, she considers photography to be a practice much like a game itself, writing:

Composition is rule based (albeit with rules that can be broken), and the act of photography is a strategic endeavor. Photography supports collecting and exploring: both popular activities in digital games. To a certain extent, photography even involves "twitch" skills. Metaphorically, there is an extended metaphor connecting photography and the most popular video game dynamic, gunplay. (2007, pp. 53–54).

This is useful for thinking about photography in apps because strategic composition will vary on purpose and app design. For example, in *Safari Central*, users try to position a small AR version of a wild animal in their own world, often to comedic or flattering effect. In my example at the beginning of this chapter, an elephant is dwarfed by my 15lb dog. *National Geographic Explore VR* prioritizes taking classic, awe-inspiring images of rare animals and natural environments. Wildeverse, is again different, prompting users to have a tracker's point-of-view where animals are always in movement. These apps present different versions of control over composition and different assumptions about what will be captured.

Poremba (2007) draws from Susan Sontag and Betsy Book to discuss screenshots as tourism in virtual spaces. Poremba suggests that "the mastery of the means to create images, be it through a computer's screen capture function or through a more sophisticated in-game mechanic, […] demonstrates the player's power over the game subject, just as in real life the ability to master the technology of the camera reflects the capacity of one to "own" the experience." (2007, p. 52). This kind of "voyeurism" and "tourism" is especially relevant for thinking about how users interact with games and apps that make them feel physically immersed in wilderness with wildlife. The apps that I am analyzing in chapter five set up the user as a photojournalist (*National Geographic: Explore VR*), a wildlife researcher (*Wildeverse*), a "rewilder" of urban areas (*Safari Central*). If (or how) these designs complicate tourism is something that will be relevant for thinking about what kind of relationships these app facilitate.

While "rewilder" is somewhat of a nebulous term with equally obscure roles and responsibilities, wildlife research and photojournalism have established expectations for photography. In wildlife research, photography functions as an empirical tool for archiving natural phenomenon. Photojournalism is similar in that it archives, but it is distinct from other forms of photography by combining three qualities: timeliness, objectivity, and narrative (Jayaswal, 2008). Jayaswal elaborates on these qualities, defining timeliness as "images [that] have meaning in the context of a published chronological record of events," objectivity as ensuring that "the situation implied by the images is a fair and accurate representation of the events they depict," and narrative as ensuring that "the images combine with other news elements, to inform and give insight to the viewer or reader" (2008, p. 32). This is quite a lot to ask of VR experience. Indeed, *National Geographic: Explore VR* falls short of this description, which I will return to in later in this dissertation. In short, *National Geographic: Explore VR* lacks elements to provide timeliness and narrative for the photographs themselves. Instead, narrative accompanies the photographic event. The app is more focused on the process of taking a photograph than the photograph itself and acts as a tour guide. In this way, *National Geographic: Explore VR* does treat its users more as tourists than as photojournalists.

It isn't surprising that National Geographic has created games that mimic tourism. Having users play at being a photojournalist would require much more work. Additionally, their own magazine constructs readers as tourists. Anne Todd (2010) addresses how National Geographic has built a particular environmental aesthetic that creates anthropomorphic distance. However, tourism does need to create

anthropomorphic distance. As Todd explains, "tourism is an environmental practice whose discourse ascribes meaning to natural places" (2010, p. 208). Sontag argues that the camera makes "everyone a tourist in other people's realities, and eventually one's own" (Sontag, 1977, p. 59). To the extent that photography constructs the user as a tourist, which certainly extends to photography in AR and VR nature-based apps, photography functions as a meaning-making tool.

These meaning-making events can both be work and calming. Returning to Sontag, she writes:

The very activity of taking pictures is soothing and assuages general feelings of disorientation that are likely to be exacerbated by travel. Most tourists feel compelled to put the camera between themselves and whatever is remarkable that they encounter. […] Using a camera appeases the anxiety which the work-driven feel about not working when they are on vacation and supposed to be having fun. They have something to do that is like a friendly imitation of work they can take pictures. (1977, p. 9).

Since much of environmental communication can be focused on distressing information—such as how the animals in *Safari Central* and *Wildeverse* are endangered and the arctic environments in *National Geographic: Explore VR* are degrading—how the act of photography may assuage distress and prompt meaning-making are important to this dissertation. These apps benefit from decades of previous photography-centered games, helping to establish interactive designs and build on even older practices of tourism and photography. However, these apps have different kinds of affordances and experiences because they leverage physical immersion in AR and VR.

**Conclusion**

This chapter has discussed how AR and VR, videogame design, and photography in digital environments converges to create special opportunities for technical environmental communication. Recognizing the separate affordances of AR as well as VR allows me to recognize design choices that are important for *either* the AR apps I am studying or the VR apps that I am studying. More importantly, tracing their common affordances present unique opportunities to communicate difficult to visualize technical environmental communication. Game studies presents important perspectives for communicating educational content in interactive media as well as well as recognizing the rhetorical power of choices and surfaces. By designing around photography, *Safari Central, Wildeverse,* and *National Geographic: Explore VR* introduce a frame to their media as well as attempt to create a certain kind of *experience* (not just products— photographs). The experience of capturing nature photographs (and nature photographs themselves), have a long history of education and personal connection. However, this photography mechanic also inherits a history of exploitation and violence through photography, prompting closer analysis. How these elements work together is central to my research questions. After reviewing central theories in chapter 3 and my methods in chapter 4, I will return to this convergence in chapter 5 when I answer my first research question: *What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?* In the next chapter, I will introduce a new materialist lens to the topics discussed in this chapter. This discussion will center largely around care ethics and set up a theoretical base for my second research

question: *How can these designs be revised or leveraged for more beneficial*

*environmental communication through care ethics?*

CHAPTER THREE

COMMUNICATING WITH, AS, AND FOR ENVIRONMENTS: POPULAR
ENVIRONMENTAL MEDIA AND CRITICAL PERSPECTIVES

In the previous chapter I presented a picture of one of my dogs (Figure 2.1)

looking out a window as I posed an AR elephant next to him in the app *Safari Central*. I

introduced this picture as an example of how different kinds of technologies and designs

converge. However, this image also draws attention to the (perhaps strange and tenuous)

gap between animal representation and living animals. My dog, a terrier historically bred

for rodent control, stares out the window in this picture looking for prey (as he often

does). This is one of his favorite past-times, and he would certainly disrupt the local

chipmunk population if not for the structural integrity of glass. Yet, when I first showed

this picture to others, they inquired about why he was looking at this AR elephant. This is

perhaps an innocuous example, but it speaks to the ability to manipulate interactions

between animal representations, users, and whole environments within and outside of a

simulation.

I am less concerned about how users choose to pose (or not to pose) their

companion animals in photos, which is more reflective of the user's relationship with

their companion animal than these apps, than I am about representations of wilderness

and wildlife. Companion animals (ideally) dwell in our spaces, so placing AR animals

next to them responds to *Safari Central*'s call to rewild (reconnect) our world. Instead, I

am primarily concerned with representations of wildlife and wilderness within AR and

VR environments, especially as they may affect actual wildlife and wilderness. As I

mentioned briefly in the introduction chapter, I am using the terms *wilderness* and

*wildlife* broadly without implying strict binaries of purity or certain kinds of "nature."

One of the goals of this chapter will be discussing how care ethics intersects with existing

scholarship on our connections with/as nature. The other goal is to explain how these

theories apply to my research. The affordances of AR and VR present unique affordances

for listen to environments, especially those that they could not otherwise access.

Environmental communication in the public sphere is often concerned with raising

awareness of issues, garnering financial support for conservation, changing harmful

behaviors, or otherwise facilitating care for environments. For this reason, care ethics is

well-suited for studies of public environmental communication. Care ethics is also

particularly relevant for my research because it engages with qualities of relationships,

such as the actions taken in the name of care, and simply the intention of care.



Figure. 3.1: An ad from Safari Central © showing a savannah and a cityscape coming together

The first section of this chapter is dedicated to theory about care and relationships between humans and wildlife and wilderness. To answer my research questions, I will use an ethics of care to prioritize connections over rules for ethical interactions. This approach includes being concerned with what is done in the name of care, such as harm or burdens on care givers. I seek to disclose how these apps may or may not call objectivity and human/animal divisions into question and present other ways of connecting with and caring about wildlife and wilderness. I first introduce care ethics (also referred to as an ethics of care) and connect it to scholarship on how popular media attempts to facilitate care. These works highlight the importance of popular environmental communication, and they illustrate how detrimental problematic portrayals can be to even well-meaning productions. One of these theories is rewilding, which can be thought of as a means of reconnecting with wilderness and wildlife. Both an ethics of care and rewilding reject notions of purity and binaries between humans and other animals and materials. Rewilding responds to such constructions and seeks to reconnect parts of nature, including humans. I introduce performance ethics (Smith, 2003) as a way to practice rewilding, which recognizes that other animals have a point of view that may be more important than our own for our shared dwellings. I conclude the first section by drawing from new materialist and feminist materialist scholarship to expand performance ethics to include listening to materials.

In the second section, I discuss how I apply these theories to AR and VR. In particular, this includes how the physical immersion of AR and VR is as an important way for materials to (intra)act across different bodies. It also includes a discussion of how

to think about experiences with "wildlife" and "wilderness" in media. I take up the term domestication to describe these kinds of *experiences*, not the things themselves. I use trails as an example of how experiences can be domesticated without ever domesticated "nature" itself. These domesticated experiences are more accessible and while still providing opportunities to listen to a variety of material performances. I argue that AR and VR can present similar opportunities to walk a trail in nature, with some phenomenon being more accessible to us than on real trails, and how nature-based AR and VR apps do (or do not) do this is central to my inquiry. Afterwards, I conclude this chapter with a summary of how this work applies to my research questions.

**Care, Connection, and Rewilding with Performances**

Since Carol Gillian (1993) proposed an ethics of care, there have been influential critiques and contributions, but it is still a theory that prioritizes connection and care over rules for ethics. Gillian proposed care ethics as a feminist framework to counter other popular ethics theories that seemed to overlook care, which has been historically coded as a feminine trait in Western society (Norlock, 2019). In Maria Puig de la Bellacasa's (2017) book of *Matters of Care*, she begins by addressing that, though care may be a human phenomenon, it does not stop with humans (Puig de la Bellacasa, 2017, p. 2). Importantly, while care ethics is most commonly applied between people, it can also include connection between humans and more than human communities. Care ethics does not draw impermeable lines between humans, more than humans, and the politics between them. De la Bellacasa uses the term alterbiopolitics to describe how care disrupts clear distinctions between different beings and rules between them. She writes:

Care troubles and opens questions here [obligations, contracts, and promises]. Connecting the practices of permaculture ethics as everyday ecological doings with a feminist notion of care displaces biopolitical moralities, allowing us to envision alterbiopolitics as an ethics of collective empowerment that puts caring at the heart of the search of everyday struggles for hope and flourishing of all beings, of bios understood as a more than human community. (Puig de la Bellacasa, 2017, p. 22)

An alterbiopolitics of care ethics is especially useful for thinking about how people engage with nature in VR because it recognizes the permeability of boundaries, both between humans and other animals and between humans and materials.

Some scholars have critiqued care ethics for being too ambiguous for its lack of rules[5] (Rachels & Rachels, 1986), but refraining from strict rules allows us to recognize the problems with care without discounting its importance. Sometimes care can be uncomfortable because of grieving. Other times, care can be exploitive or abusive in its divisions of labor. Maria de la Bellacasa explains that care ethics is not about the purity of care; she writes that reclaiming care is "all but about purging and 'cleaning' a notion; rather, it involves considering purist ambitions—whether these are moral, political, or affective—as the utmost poisonous." (2017, p. 11). The word *care* is loaded with a need to address context and situations that often disclose "what is actually *done* in different situations under the blanket of care." (Puig de la Bellacasa, 2017, p. 11). Following Puig

---

[5] Rule-based ethics, also known as normative ethics, include many popular approaches such as utilitarianism, Kantian deontology, and virtue ethics.

de la Bellacasa's theory of care and purity, care ethics includes recognizing that we, as humans, are complicit in the destruction and harm of other species and environments. Caring does not make us pure, and our caring may not be without harm. By applying care ethics in my analysis, I am prioritizing connections between users and representations of wilderness and wildlife (especially as it attempts to create realistic impressions of actual animals). I am also concerned with the qualities of relationships and what may be done for the sake of them. For example, is wilderness and wildlife portrayed in a way that may support harmful notions despite attempting to facilitate care? Or, similarly, how is responsibility for environmental degradation addressed and who might be burdened for redressing these harms?

Definitions of care usually include being subject to or bound with another in some way. Donna Haraway writes that "caring means becoming subject to the unsettling obligation of curiosity, which requires knowing more at the end of the day than at the beginning" (2013, p. 36). Previous definitions of care have emphasized more sorrowful emotions. The Oxford English Dictionary lists several definitions of *care* that were last used in the 1700s: mental suffering, sorrow, grief, trouble (Oxford English Dictionary, 2020). While this doesn't need to encompass *all* caring, it does highlight a (now) easily over-looked aspect of care that is particularly relevant to environmental destruction.

In Amy Propen's (2018) book *Visualizing Posthuman Conservation in the Anthropocene*, she writes about engagement with haptic visuals and grieving in a way that closely resembles previous definitions of care. Quoting the photographer Chris Jordan, who documented albatross dying from plastic consumption, Propen writes: "I did

a lot of grieving on Midway . . . and I've come to believe that it's actually a transformationally powerful experience. There's something really important about grief. It's different from despair and sadness. Grief is the same as love. It's a felt experience of love for something that we're losing or have lost" (2018, p. 72). This grieving-with is essential for engagement. It is material and visceral. Propen describes it as requiring "embodiment, visceral stories, the transmission of elemental, haptic energies that help enact figurations--perhaps haunted figurations--that grieve with, feel with, to become with" (Propen, 2018, p. 75). Propen writes about this particular kind of connection (becoming-with) in reference to photographs for popular media, and I am particularly interested in how this kind of care is or is not facilitated in the apps I am studying. Though environmental communication does not always need to be centered on degradation and loss, how connection with people, animals, and material who are most affected by environmental degradation is managed (or avoided) is an important point of inquiry.

Another way to think about connection, and the care that can come with it, is the practice of rewilding. *Safari Central* has the provocative catchphrase and hashtag "rewild your world," but consideration for rewilding should go beyond media that explicitly invites you to do so. Rewilding has different implications depending what field someone is working in. Mark Bekoff (2014) draws from the practice of conservational rewilding in his book, *Rewilding our Hearts*. In conservation science, rewilding has a very specific meaning with accompanying strategies. Michael Sole and Reed Noss first popularized the notion of rewilding in the late 1990s, and since then the concept has been condensed to

three main premises; as the Director of the Rewilding Institute in Albuquerque, New Mexico states: "(1) healthy ecosystems need large carnivores, (2) large carnivores need big, wild roadless areas, and (3) most roadless areas are small and thus need to be linked" (Foreman, 2011 cited by Bekoff, 2014, p. 9). Rewilding is equally about boundaries and connection. Although rewilding connects tracks of land to "make room for much more diverse, healthy, and sustainable ecosystems that are as natural as they can be given our omnipresence," rewilding imposes boundaries and modifications; conservationists "don't simply let whatever happens happen in a landscape" (Bekoff, 2014, p. 10). Following this central thread, Bekoff's notion of rewilding is about reconnecting for the benefit of wildlife and wilderness, not some notion of purity of nature that creates distance and a binary between people and wildlife. Bekoff applies this notion of rewilding to individuals, communities, and media.

Of course, to *re*wild, we must have been *un*wilded at some point. Bekoff argues that unwilding is "the process by which we become alienated from nature and non-human animals; it's how we deny our impacts and refuse to take responsibility for them; and it's how we become discouraged and overwhelmed, and thus fail to act despite the problems we see" (2014, p. 33). For my own work, I would amend this by acknowledging that there are *many processes* by which we become alienated to *other* forms of nature. There is no need to put everything under one term or to not acknowledge that humans are a form of nature, a subject I will return to later in this chapter. Bekoff identifies three main causes of unwilding: human exceptionalism, denial of destruction, and the "hustle and bustle of modern life" (2014, p. 36). Of the three, human exceptionalism is almost

certainly the most pernicious and insidious. Nature enthusiasts can give up the "hustle and bustle" of modern life and have an (uncomfortably high) awareness for their complicity in environmental degradation while never giving up the belief that we (humans) are exceptional to all (other) forms of nature.

Human exceptionalism creates a hard line between people and all (other) forms of nature, and it thrives on fantasies about the purity of nature. There is no part of the earth that has not been subject to the influence of human designs, whether that be through physically altering a space, managing resources, or through the afterlife of artificial products, such as microplastics. Fantasies of untouched, pure wilderness both deny the destruction of environments and create an idealization of nature from which humans are exempt. This allows people to feel a safe distance from the destruction we have caused to environments as well as the destructive forces of nature itself. In Alexis Shotwell's (2016) book, *Against Purity,* she outlines how purity is ineffective and entrenches problems, writing:

> I argue against purism because it is one bad but common approach to devastation in all its forms. It is a common approach for anyone who attempts to meet and control a complex situation that is fundamentally outside our control. It is a bad approach because it shuts down precisely the field of possibility that might allow us take better collective action against the destruction of the world in all its strange, delightful, impure frolic. (Shotwell, 2016, pp. 8–9)

Perhaps because of the difficulties of portraying complexity, or because of the underlying assumptions of creators, or just the pressures of appealing to a wide audience, this

"strange, delightful, impure frolic" can be difficult to portray. Whether it is because of difficulty or intentional, the lack of strange, impure frolic has significant consequences for the portrayal of wildlife and wilderness.

Bekoff also comments on the portrayals of animals in media. Explaining problems with wildlife in documentaries he writes:

> The details may be correct, but the impression radically misrepresents animal lives and feeds the false notion that nature is a competitive, brutal game of 'survival of the fittest.' In fact, wild animals spend much of their time resting and being nice to one another, playing, sharing food, and cooperatively defending food and territory. (Bekoff, 2014, p. 110)

The over representation of sex and violence is also accompanied with showing mistakes made by nonhuman animals to illicit laughs, but animals are "not as daffy as they are sometimes made out to be" (Bekoff, 2014, p. 110). These portrayals distance humans from other animals by highlighting traits that are considered uncivilized: too much aggression, sexuality, or silliness. Although nature documentaries have been important products for facilitating interest and maybe even compassion for nonhuman animals, they often present nature in a way that alienates people from it, which leads to Bekoff calling for a "rewilding of media." Bekoff presents a useful way forward (rewilding), I seek to build off of his work by connecting it to other theory on care and material agency. As an emeritus professor of Ecology and Evolutionary Biology, Bekoff brings unique perspectives from the sciences and establishes interdisciplinary dialogue. To further this discussion, I first turn to Laura Marks who describes a similar problem in more detail.

Marks (2002) uses the term "petishism" in her book *Touch* to explain some of the differences between nature stories from popular Western sources (such as the Discovery channel) and those of indigenous peoples. The term was first coined by Friedberg, who defined it as "a fetishism in which one overidentifies with animal Others and allows oneself to be fascinated with non-human Others" (Friedberg, 1989 cited by Marks, 2002, pp. 25–26). Marks makes the connection between this term and Haraway's work, pointing to her quote "we polish an animal mirror to look for ourselves" (Haraway, 1991 cited by Marks, 2002, p. 24). Building upon this, Marks writes that "disavowing any commonality between self and other, one renders the other a screen for projection, whether it is to project noble-savage fantasies on other humans or bestial-animal fantasies on beasts" (2002, pp. 24–25). Petishization does not occur when someone takes an interest in a nonhuman other, recognizing and respecting both its otherness and that it holds a unique place on an animal continuum (where humans also hold a unique place). It does not even occur when people imagine the mind of the other for the benefit of others (assuming that they understand it is just imagination—not an exact perception or insight into that other being). Rather, it *does* occur when people project onto other animals, disregarding their unique place in an animal continuum (which may be considered flat, not hierarchical).

Falling in line with Bekoff's description of unwilding, the three qualities of petishization that I want to highlight are over-identification, over-representation of certain traits, and domination. Over-identification happens when we create a mirror out of nature for ourselves (which ironically obscures our ability to perceive ourselves as a

unique form of nature). This can be seen in environmental communication that perpetuates notions of pure nature for us to reflect ourselves onto. Over-representation of certain traits happens when environmental communication sticks to strict narratives of how animals behave (which does not usually include much outside of violence, sex, and silliness. Dominance, however, is much more difficult to outline. Sometimes it is overt, such as how people have bred for certain traits in companion animals. Other times, the forces that dominate us are difficult to discern, such as gut bacteria that enable or prevent our most mundane life-sustaining functions. And still other times dominance is only an illusion. Rethinking dominance and our relationships to (other) natural phenomenon presents ways for enacting care ethics and rewilding media.

Yi-Fu Tuan's (1984) book *Dominance and Affection: The Making of Pets* is an influential text that needs to be addressed in any discussions of animal studies and dominance. His claims of what constitutes affection and care are very specific and have troubling implications. Describing the limits and purpose of affection and care, he writes:

> Affection mitigates domination, making it softer and more acceptable, but affection itself is possible only in relationships of inequality. It is the warm and superior feeling one has toward things that one can care for and patronize. The word *care* so exudes humanness that we tend to forget its almost inevitable tainting by patronage and condescension in our imperfect world. (1984, p. 5).

Defining affection as the 'warm and superior feeling' that one feels presumes a hierarchy that may or not be there, and it certainly ignores complex power relationships. Rather than describing all care and affection, this describes a very specific experience. This

experience, I argue, is (at least in part) the same as what Marks describes with petishism. In other words, what Tuan describes the affection that comes with animal hierarchy is also seen in Marks' (2003) description of petishism through over-identification, over-representation of certain traits, and dominance.

Tuan also makes important claims about materials and the qualities of power, which speaks to domination. He claims that 'power in itself is good' and that it is vitality and a "state of being that all animals want" (Tuan, 1984, p. 7). He gives examples of how we admire power in animals and other natural phenomenon, such as a thunderstorm. While staring in awe at the power of a thunderstorm does seem like something nearly everyone must have done at some point, and all life seeks power in some form to fuel our bodies, I do not think assigning moral value to power itself is useful (how moral of a bolt of lightning is not useful to this discussion). Additionally, Tuan's description lacks appreciation for the fact that we, humans, are made up of many nonhuman materials that have power. Or, as Jane Bennet writes, we are vital materialities that are "an interfolding network of humanity and nonhumanity" (2010, p. 31). Instead, Tuan writes about power that creates lines between humans and nature, claiming that "power is able to reduce humans to animate nature" (1984, p. 15). This reduction, and the hierarchy implied by it, creates a degree of separation that disavows the continuums of animals and all forms of nature.

Somewhat ironically, Tuan describes the outlook that Bekoff, Marks, and so many others have pushed back on in concise, useful ways. The limitations that Tuan puts around power, affection, care, and humans aptly describes certain kinds of problematic

relationships that exist between humans and nonhuman animals. Zoos are perhaps the ultimate form of dominance over other animals. Reflecting on these spaces, he claims that 'making another eat out of our hand—*that* yields a special thrill all the greater if the animal is first made to beg and if it is large enough to crush us in another setting less structured in our favor' (Tuan, 1984, p. 80). This sort of thrill and affection *does* only function through dominance, especially when power imbalances are reversed. Again, I want to emphasize that he is claiming that this experience is universal, and I push back on that idea because it excludes so many other experiences. However, for the instances where it does apply, it shows how a craving for dominance shapes even our generous (sometimes caring) actions. Tuan extends these notions to our desire for house pets as well, considering pets a solution to humans needing an outlet for gestures of affection and a way to obtain physical contact (Tuan, 1984, p. 12). While these may certainly be a part of why people keep pets, other scholars have tried to look past this rigid relationship between dominance and affection.

In response to Tuan's work, Julie Smith (2003) presents 'performance ethics' as another way to think about the relationship between humans and companion animals beyond his dominance-affection relationship, which is useful for getting beyond petishism and going towards rewilding. Smith pulls from feminist work to craft this idea. However, she does not position it as a form of care ethics. It is unclear why Smith didn't want to make this leap, but I consider her work a (perhaps) unintentional application of care ethics because it prioritizes relationships above rules behavior. Performance ethics is about human-pet relationships, but I also want to extend it to other scenarios where

humans have considerable control, such as in rewilding practices and when people

represent wildlife. Performance ethics accepts that 'domestic animals will never be equal

partners to humans only because they live in arrangements for another species' but also

provides "opportunities for animal agency and recognition that animals actively utilize

these to perform their own natures" (Smith, 2003, p. 182). I think that this approach

works well for rewilding practices as well. All wildlife is subject to land management,

and representations of animals are always curated by humans. Wildlife will never be an

equal partner in making decisions about rewilding or representation. However, that

doesn't mean that wildlife has no agency or ways to communicate.

The most important aspect of performance ethics helps us humans listen and

respond to other animals' actions. Performance ethics recognizes animal behavior as

transactional performances. That doesn't mean that we will always understand them, or

that we ever could. These performances are often in some small or large ways

inaccessible to human interpretation because "performance ethics implies that animals

may understand their own actions in ways that human language cannot represent" (Smith,

2003, p. 196). Even if this listening is imperfect and incomplete, recognizing behaviors as

performances allows for an attempt at interpretation, positioning caretakers as listeners of

open-ended possibilities.

Smith explains how simply letting her companion rabbits rearrange furniture in

her house allowed these animals to have agency over a shared dwelling. She writes:

> After many years of living with rabbits, I noticed that they liked free corridors
>
> along perimeters. Before this, I would dutifully place litterboxes and toys along

the walls of the playroom after I had cleaned each day. By night, the room was a 'mess.' Eventually I noticed that it was a particular kind of mess: Everything moveable in the room was in the middle of the floor. This observation changed forever the way I live in my house, as did my understanding of other rabbit preferences: spaces along borders and boundaries, enclosed spaces with more than one exit, spaces that allow them to see out but not be seen. (2003, p. 188)

Smith expresses preference for this 'version of "becoming animal" that has been granted social permission through her local group rabbit owners who also share this practice (2003, p. 188). This "version of becoming animal" also included modifying cages so that they were more like private rabbit spaces and the rest of the home was modified based on rabbit performances. These actions were more about limiting human influence in certain areas rather than confining animals to small areas, much like rewilding.

It is tempting to think of these examples as simply learning species behavior. Rabbits are prey animals, and they will naturally prefer to alter their space in a way that would be safer for them in the wild. Similarly, my companion animals present breed traits that make staring out the window for prey a self-rewarding activity. To some degree this is true: prey-behavior and prey-drive can be almost impossible to train out of even domesticated animals. However, Smith also explains that not all rabbits perform the same way. This is probably not shocking to anyone who has kept different companion animals and looked upon their behavior as transactional even just a fraction of the time. Reflecting on using this practice, she writes: "It allows for increasingly enriched interactions, as the animals and I develop intuitions about each other's natures. It

acknowledges that they have a point of view toward me that is more important than the rules that I may devise for myself" (Smith, 2003, p. 196). This is an important distinction from simply noticing individual personalities in companion animals. Performance ethics recognizes that other animals have a point of view that may be more important than our own for our shared dwellings.

Another aspect of performance ethics includes letting animals initiate interaction. Where this is an option, it removes some degree of dominance, giving companions the autonomy to set limits on interaction. Of course, companion animals sometimes *are* best off subjected to our dominance despite clear communicative transactions. Here I am thinking of vet visits and limits of certain foods. But again, purity is not the goal. Sometimes a purely equal relationship is not the most beneficial for other animals. They *are* different from humans and pretending like they aren't again disavows a continuum of animal life. Rather than condemning a dominant-dependent relationship with other animals (which seems a little too easy to do under Tuan's dichotomy) Smith's performance ethics rethinks what that dominance constitutes and to what degree it needs to be performed. People become listeners and subject to the agency of other living beings. Performance ethics allows humans to listen to needs across species differences, and it does so while still recognizing that there are differences between individuals of a species and that humans may never (and probably never will) fully understand the communicative performance as the other animal intends.

Practicing performance ethics can be beneficial for animals who aren't our companions. In any situation where humans can or do have dominance over other

animals, it can help create a more caring relationship. This practice enacts care as a verb, troubling us with the concerns of others. Performance ethics is strikingly similar to the large goals of rewilding. It allows people to limit ourselves so that we make room for other animal performances just as rewilding allows us to limit human influence so that others can enact theirs. And again, they both emphasize connection across differences. Recognizing behavior as performances allows us to listen to what other animals want out of their environments, their relationships, and give glimpses into individual experiences and natures. Unfortunately, as Bekoff and Marks note, most representations of wildlife don't have an approach similar to this. Instead, popular media often features representations of wildlife that do not acknowledge their individualism or listen to performances. It's a small leap between the performances of pets and other animals, especially when human dominance is a factor, but in the next section I am going to push the idea of performance ethics even further.

*Materials and their Performances*

      I do not think it is a large conceptual leap to apply performances ethics to all other kinds of nature. I've already addressed how it can be applied to wildlife, but here I will argue that it makes sense for wilderness as well. Wilderness usually implies a region that is minimally cultivated and describes plant life and other materials. Understanding performativity as a communicative act—again, without the implication that we can fully understand it—positions us as listeners. Performance ethics can help position us as listeners to not just the wildlife of the wilderness, but also its plants, fungi, and other materials.

I don't need to present performance ethics as a way to introduce the theory that materials have performances. This is already well established in rhetorical studies. Nathan Stormer and Birdie McGreavy explain that "one does not classify forces as ontically rhetorical or nonrhetorical; instead one studies tangled forces that conditionally empower addressivity" (2017, p. 15). They go on to give the example, "the question is not whether tides are rhetorical, for instance, but rather how they participate at any moment in multiple, different rhetorics emerging from entanglements" (Stormer & McGreavy, 2017, p. 15). To build from this example, the Grand Canyon is not a rhetoric of water (its effects on the earth); instead, water and other materials addressed each other in their own emergent rhetoric. These examples help visualize a rhetoricity that takes place over deep, geological time, but we don't need to look to such extreme examples to illustrate how materials perform or engage in rhetoricity.

The material turn in rhetorical studies is based on having learned that language constructs our realities *and* that it interacts with materials and technologies (Hekman, 2008). Both new materialism and feminist materialism are relevant to my work here. New materialism recognizes the "vibrancy" in matter. In Jane Bennet's *Vibrant Matter,* she introduces "thing power" to describe the actant power of things in an assemblage, drawing from Latour's actor network theory (ANT). Latour does not recognize the ability of rhetoric to "proceed smoothly into the nitrogen cycle" or other places past consciousness (Walsh et al., 2017). Still, Latour's ANT and its distributed agency can be useful for mapping the relatedness of things and power distributions in a network. Vibrant matter and similar concepts within new materialism reject cartesian dualism,

which strips agency from nonhumans (such as other animals and material) because it is devoid of soul or self-awareness. Agency and performativity, many now recognize (Alaimo, 2010; Barad, 2008; Coole & Frost, 2010; Hekman, 2008; Tuana, 2008), do not require intention or self-awareness.

Discursive practices, Karen Barad explains, are the performances of phenomena, and they are not based on human-practices. Elaborating on this, Barad writes that discursive practices "are not speech acts, linguistic representations, or even linguistic performances, bearing some unspecified relationship to material practices;" and they are not "anthropomorphic place-holders for the projected agency of individual subjects, culture, or language" (2008, p. 139). This pushes back against a linguistic understanding of the world and representationalism (the belief in words to represent a pre-existing reality).

Barad's pushback builds on empirical findings from physicist Neil Bohr, Bohr theorizes that the causal relationship between production and what is produced is an agential intra-action. This disrupts the commonly understood cause and effect relationship. Barad elaborates on this, writing:

> Phenomena do not merely mark the epistemological inseparability of 'observer' and 'observed'; rather, *phenomenon are the ontological inseparability of agentially intra-acting 'components.'* That is, phenomena are ontologically primitive relations—relations without pre-existing relata. The notion of *intra-action* (in contrast to the usual 'interaction,' which presumes the prior existence of independent entities/relata) represents a profound conceptual shift. […] Reality

is not composed of thing-in-themselves of things-behind-phenomenon, but of

'things'-in phenomenon. The world *is* intra-active in its differential mattering. It

is through specific intra-actions that a differential sense of being is enacted in the

ongoing ebb and flow of agency. That is, it is through specific intra-actions that

phenomena come to matter—in both senses of the word. (Barad, 2008, pp. 133–

135).

What Barad outlines here as intra-action can be found in many other descriptions of how

materials have performance and agency in the world that they co-create with other

materials.

Performances are discursive practices, and I understand what Smith (2003)

describes as "transactive communications" in performance ethics to fit well within this

framework. The transactive communications that Smith describes are not linguistic, and

she acknowledges that they help her "become animal" in a certain way. To borrow the

language of Karen Barad, Smith understands performances as intra-active discursive

practices. These performances are sometimes described in other ways. Stacy Alaimo

(2010) introduces the term transcorporeality, recognizing the transformative power of

materials to affect and become parts of different bodies. Similarly, Nancy Tuana (2008)

introduces the term viscous porosity, also addressing the permeability of seemingly

discrete material bodies. In Tuana's example of viscous porosity, she (un-earnestly)

invites readers to burn a piece of plastic and breathe in the air. She calls attention to how

the material has the power to change bodies even as they become a part of that body (in

this example, dioxins from burned plastics are endocrine disrupters) (Tuana, 2008, pp.

200–201). In ways that have very dire consequences, chemicals have communicative

actions within our bodies that exert agency over and with us (I might even say

dominance).

Positioning ourselves as listeners to performances of materials can take on many

forms. Susan Hekman (2008) explains that science does not disclose nature. Instead, we

find ourselves within scientific and technological practices that disclose what it is to be

nature. Similarly, Diana Coole draws from Merleau-Ponty and other scholars to describe

life itself as a fold. This perspective sees all matter as *being,* where there is no place

where nature ends and the human begins (Coole & Frost, 2010). This does not mean that

things are the same. The folds disclose nature coming into being in different forms.

Donna Haraway (2013) presents another outlook that is particularly appropriate

for thinking about interactions between ourselves, other animals, and technology. In her

book *When Species Meet,* she considers what we touch when we touch a dog, or any

species for that matter. At the beginning of the book, she introduces readers to a picture

of Jim's dog. This "dog" is a made of mosses, ferns, and other plant matter on an old log,

but she addresses it as a species. This is an example that points to how species (in the

typical sense of the word) are a made of a "motley crew" that (or who) co-create each

other. She recognizes that organisms are ecosystems of their own, made up of genomes,

partly digested food, and boundary formations that fold in on themselves. Our ability to

"see" these species (and to some degree *be* these species) is also a matter of technology.

Describing her ability to meet this species, she writes:

We touch Jim's dog with fingery eyes made possible by a fine digital camera,

computers, servers, and e-mail programs through which the high-density jpg was

sent to me. Infolded into the metal, plastic, and electronic flesh of the digital

apparatus is the primate visual system that Jim and I have inherited, which its

vivid color sense and sharp focal power. (Haraway, 2013, p. 5)

The technology that helps us recognize (and connect) to other species is central to my

work. Haraway recognizes that these materials are partners with us. Haraway emphasizes

that "partners do not precede their relating; all that is, is the fruit of becoming with"

(2013, p. 16). This is not about saying that all things are the same, but about recognizing

the (viscous) porosity of boundaries and drawing our attention to the fact that we are

made of and by many things. What Haraway calls companion species are all the other

species and materials that intra-act to co-create us. Some intra-action takes place within

the boundary of the skin, some does not, but the boundary is always generative and

porous.

My goal in using these theories is not just to have a better understanding of the

nature of nature, but to help develop connections between users of these apps and the

forms of nature that are represented in them. It is also to interrogate the quality of these

connections, not assuming that care and connection is free from inflicting harm. Once we

can recognize performance and rhetoricity in materials, we can apply performance ethics

to it as well. Knowing that we can never fully understand the performances of other

materials/species/mess mates, what can we still learn by positioning ourselves as listeners

to transactive communications? This question does not imply that we (humans) give up

as much design autonomy as possible. We are people designing apps for other people. Some anthropocentrism should be expected. However, we must be equally invested in listening. As Jane Bennett writes, "the political goal of vital materialism is not the perfect equality of actants, but a polity with more channels of communication between members. […] How can humans learn to hear or enhance our receptivity for 'propositions' not expressed in words?" (2010, p. 104). AR and VR present unique ways of helping people listen to environments that they could not otherwise access by representing them in physically immersive ways.

**Connecting to (and in) AR and VR**

How we manipulate our experience of the immediate world is the work of AR and VR apps, and how we understand and relate to other forms of nature is the principal focus of environmental communication. Stacy Alaimo writes of the connection between material agency and environmental studies:

> Acknowledging the agency of all that is not human affirms the need for places—urban, suburban, and especially 'wilderness'—in which the 'doing/being' of creatures, ecological systems, and other non discrete lifeforms can flourish. In fact, one of the most fundamental values of environmental ethics—the value of the 'wild'—can be understood as nature's ongoing, material-semiotic intra-actions—actions that may well surprise, annoy, terrify, or baffle humans, but that nonetheless are valued by environmentalists as the very stuff of life itself. (Alaimo, 2008, p. 249)

If wilderness is the "very stuff of life itself," then unwilding is a lack of listening and loss of connection to vibrant matter, even as we are made of it.

The materials of AR and VR (intra)act with users just as much as the design choices that creators make. These always take the shape of some representation (unless there is an error or a blank screen), but before I address those representations, I want to give materials their due. This includes paying attention to how users can engage with the materials (light, plastic, screens, etc.) of AR and VR. The physical immersion of AR and VR is as an important way for materials to (intra)act across different bodies. VR makes users feel like they are in another place and, sometimes, like they are in another body or living a different life. While most forms of media do this through some sense of mental immersion, presence built on physical immersion can have different effects (and affects). VR uses primarily optical and auditory input to create a sense of physical immersion. This means that eyes are especially important for feeling presence. Although AR also uses optical and auditory input, it is far more reliant on seeing and touching a screen to create presence. Put another way, their affects can be similar, but the intra-actions of bodies, environments, and technologies are very different.

Haptic perceptions usually involve proprioceptive functions and kinesthetic experiences, but haptic visuality is an important part of AR and VR as well. Referencing how the art historian Alois Riegl (1985) used the term, David Breton explains that "the act of looking at something up close is sometimes an almost tactile or haptic way of seeing that plunges into the depth of things, like a sort of palpation with the eyes" (Le Breton, 2017, p. 34). Laura Marks (2002) also writes about haptic visuality in her book

*Touch,* but her definition contradicts Breton on the subject of depth. She explains that a haptic looking "tends to rest on the surface of its object rather than to plunge into the depth, not to distinguish form so much as to discern texture" (Marks, 2002, p. 8). Though these definitions disagree on what touch may do, they both resemble the fingery eyes that Haraway writes about.

Marks claims that "haptic images do not invite identification with a Figure so much as they encourage a bodily relationship between the viewer and the image" (2002, p. 3). This is in contrast to "optical representation" that creates greater distance so that the viewer can imaginatively project themselves onto or into an object. This isn't to villainize optical vision or even to imply that it is usually mutually exclusive with haptic visuality. Marks describes them both as necessary, writing:

> In haptic *visuality,* the eyes themselves function like organs of touch. Haptic visuality, a term contrasted to optical visuality, draws from other forms of sense experience, primarily touch and kinesthetics. Because haptic visuality draws on other senses, the viewer's body is more obviously involved in the process of seeing than is the case with optical visuality. The difference between haptic and optical visuality is a matter of degree, however. In most processes of seeing both are involved., in dialectic movement from far to near, from solely optical to multisensory. (Marks, 2002, pp. 2–3)

Both AR and VR trick bodies into believing the world is augmented or replaced. This fits with Marks' multisensory explanation and the depth described in Breton's definition.

One example of haptic visuals makes the parallels between what feminist materialist scholarship discusses and what is being developed in physically immersive media strikingly clear. In a recently published chapter, Stacy Alaimo (2017) looks at how ocean acidification is communicated. She explains that ocean depths resist flat maps that position people as disengaged, objective observers. Instead, problems like this must be scientifically captured and creatively expressed. She claims that we must become immersed like we are submerged in water. At nearly the same time, Stanford's Virtual Human Interaction Lab created an experience to help educate users about this very thing, which is now available free to download in platform marketplaces and for the HTC Vive and Oculus Quest.

In the Stanford Ocean Acidification Experience, users go through different places, including near a car emitting $CO_2$ and deep into the ocean. While users are in the ocean, they interact with pteropod shells that are breaking apart because of ocean acidification (an effect of $CO_2$ absorbed into the ocean). Their study considered "empowerment, perspective-taking and visualization as the three principal avenues through which virtual reality may contribute to mitigating the challenges to teaching [ocean acidification]" (Fauville, Queiroz, et al., 2020, p. 1). Visualization and what happens through it are common areas of study between physically immersive media scholars like Alaimo. Alaimo writes about photographs of these same shells as immersive. These photographs show pteropod shell dissolution from day 0 to 45 days in acidified water. Aspects that Alaimo calls the most attention to the aesthetically entrancing and ghostly qualities of these shells.

Alaimo's discussion on pteropod shells is reminiscent of Amy Propen's description of suffering-with that I presented in the introduction and found complementary to a definition of *care*. Propen uses haunting photographs to connect becoming-with and suffering-with. For her, this was realized through photographs of albatross dying from plastic consumption. These haptic images of pteropods and albatrosses call attention to how the *material* shapes communication, and creates affect, in ways that something like a map or diagram fail. The ghostly nature calls attention to flesh and especially the fact that it is missing. Alaimo recognizes that this brings our attention to the fleshiness of the Anthropocene, how we are materially affected and that effects of the climate crisis are not an abstract force. Perhaps because of the symmetry of shells, or the way that acid dissolves materials, these images invite haptic engagement. In these photographs we are left to look at the surfaces that degrade and appreciate their growing absence.

The affect and immersion that Alaimo and Propen recognize in photography is understudied in physically immersive media. Depictions of absence (the same absence of pteropod shells!) is happening in VR studies about environmental communication. However, Stanford's study does not examine at how haptic visuality exists (or doesn't) among users and how that may affect their experiences. There is much to be gained by applying some of the theories I have addressed here to Stanford's Ocean Acidification experience, such as trying to understand whether disintegrating pteropod shells have a

similar affect with users as they did in the photographs that Alaimo writes about.

However, there is little crossover between such studies.[6]

Haptic visuals may only sound like a design choice (do we put in a video that shows the details of material changes or not?), but this is also a question of the limits of our technology. Commercially available VR is not capable of depicting details in the same way as a photograph. Additionally, anything that is digitally drawn in a program for AR or VR tends to have very low visual quality. This may be an obstacle for AR and VR, but there are other ways of creating haptic visuality. Marks explains that "the speed with which the images fade in and out and the brevity with which each shot remains in focus frustrate optical knowledge and, instead, invite haptic speculation" (2002, p. 10). Speed is certainly within the capabilities of current AR and VR technology. Additionally, other scholars have expanded this term. Anable (2018) includes touch for screens, controllers, keyboards, or other materials as a form of haptic visuality. Again, AR and VR engage the eye in a multisensory illusion, which presents many opportunities for haptic visuality.

*Domesticated experiences, not things*

This dissertation is focused on CGI representations of wilderness and wildlife, so it is reasonable to ask, "Is this domesticated nature?" Video capture, scans, or other representation of wilderness and wildlife may widely be considered a domesticated version of nature. However, I argue that there is no essence or essential quality of

---

[6] I have not chosen to include Stanford's Ocean Acidification experience in my study for two reasons. First, I do not have participants to which I could direct this question. Second, it does not include photography However, I would like to conduct research that could address this question and others like it in the future.

domestication, especially not when domestication is understood to be control over nature. Instead, we can understand domestication as an experience or a way to engage with nature that is more suitable to whatever our (human) goal is at that time. The important distinction is that this does not completely remove agency or intra-action between materials. To illustrate this point, I will discuss formal definitions of domestication, what we can learn from a wilderness trail, and how to apply that to technology.

Domestication, despite its etymological ties to homes, is not defined by dwelling with humans. Animals that live with humans, are instead called pets. Of course, pets do not become domesticated simply sharing a domicile with us (undomesticated pets are considered exotic pets). Domestication is defined by neoteny and a dependence on humans, In Margo DeMello's book, *Society and Animals*, she addresses many societal structures for animals, including domestication and pets. Describing domestication, she writes:

> Because a handful of traits (such as curiosity, lack of fear, willingness to try new things, food begging, submissiveness, etc.) found among the juveniles of a species are those selected in domestication, the physical traits of the young (shorter faces, excess fat, smaller brains, smaller teeth, etc.) will also be selected. This leads to modern domesticates that are physically and behaviorally unable to live independently and that are, in fact, perpetual juveniles (a condition known as neoteny). (DeMello, 2012, p. 189).

This clinical definition is certainly useful in animal studies, and it is one of the most extreme examples of how humans alter not just the slow-moving plants and materials of this earth but also the materials and genetic coding of our fellow creatures.

However, this altering should not be understood as absolute control. The degree to which other species (and I mean this in the broad, Haraway sense) can be altered depends just as much on the materials that they are made of (and how they act) as what acts with them (I am applying the theory of intra-action here). Materials act with each other even as they become a new thing themselves. To build on the example of neoteny, selective breeding only works because of what is already present in a species' body. Whether it is a new mutation or something that has been present for many generations, this practice only works because of what the other species brings to the table. In our world of CRISPR gene editing, some may feel that they can get around the material agency of bodies. But again, the degree to which we can edit genes is dependent on what the body will "read" and act with. Similarly, the degree to which other forms of nature can be photographed, filmed, or otherwise captured is always an intra-action between those "natural" materials and the materials of our technology. The infrared displays of flowers are not disclosed to our cameras because we will it so, but because we have created materials to intra-act with them in ways that having meaning to us.

To give another example that may appeal more to those of us who don't have a background in biology or formal photography (including myself), I present a humble wilderness trail. Wilderness trails present a very specific kind of interaction with nature, one that walks a strange line of preserving forms of nature and cultivating a place for

humans in it. Figure 3.1 shows a sign posted by the USDA Forest Services before the Bad

Creek Trail leading into the Ellicot Rock Wilderness of the Nantahala National Forest.

This sign sits on stolen land from the Tsalaguwetiyi (Cherokee, East) tribe, which is

notably absent from the abundant text here. Still, I think this sign may be of some use for

thinking through the domestication as an experience, not an essence.



Figure 3.2: Nantahala National Forest Sign for the Ellicott Rock Wilderness. Image A shows the whole sign. Image B is zoomed in on the text at the top of the sign.

This sign provides quite a lot of useful information for hikers, including a map, warnings, rules of conduct (such as no leave no trace). Just below the heading *Welcome To Your Wilderness!* the sign reads, "Wilderness is a special, wild place where Nature dominates and you are a visitor." This is reinforced in other places on the sign, which read that wilderness is "managed to protect its primeval character" and that "there are hazards in this wild land." This sign certainly sets up traditional human-nature dichotomies, but I think that this can be excused to some degree here as a matter of practicality. What I am more interested in is how this sign sets up expectations for the dominance of non-human agency.

I have hiked this quiet trail down to the Chattooga River many times, sometimes in the frost and sometimes in the humid summer, but I have never shared the little bit of river beach with another hiker. Most times it is so secluded that I do not pass by any other humans the whole day. On those occasions I am particularly aware of the dangers of the wilderness around me and their ability to (intra)act with my body. Sometimes I am reminded when passing by the droppings of coyotes and bears. Other times by warily navigating my way around yellow jackets. And still other times I am thwarted by nothing but slippery rocks, which (intra)acted with my camera lens in such a way that cost me a considerable portion of my graduate student monthly stipend. These experiences fit the expectations that the sign puts forth very well.

Yet, other times I have been on this trail, I have poignantly felt the presence of other people. On one occasion before it was clear whether COVID-19 could easily spread

outdoors or not, I remember the anxiety of pulling out my mask quickly and scrambling for (social) distance across slippery rocks. On another occasion, I heard the creaking and snapping of branches. I was worried I was about to turn the corner on a scratching bear. However, when I came around the turn, I saw two kind volunteers bending and trimming the branches of the rhododendrons to form what hikers affectionally call a "green tunnel" trail (I quickly replaced my bear mace before they noticed me). In these situations, I am reminded of how the trail I walk through the forest is indeed a strange, twisting line where different species meet.

Is it reasonable to say that anything I encounter on the trail, such as a predator, insect, rock, or tree is domesticated by appearing on the trail, a cultivated line for humans to walk? I would certainly say no. And what about when a predator is deterred by my noise, an insect reacts to me, the rock becomes worn down, and trees are pruned? Again, I would certainly say no. How each of these forms of nature reacts is a part of its own agency (conscious or not). To think that my presence and intra-action with the trail could remove its agency is a gross exaggeration of human power. I would say, however, that my *experience* of these other forms of nature is drastically changed and domesticated by the trail.

The trail domesticates my experience because it filters what I experience. I become less subject to the material agency of the forest than I would be if I wandered off of it. I am less subject to it than if the trees were left unmaintained. On the trail my path is laid before me, easing my sense of responsibility (I am not concerned with plotting my route via a GPS or paper map). The power of wilderness does not work so harshly on me

as it would without this domesticated experience. And for that, I am thankful for trails. I do not think domesticating an experience is inherently negative. It makes walking a strange line where species meet accessible to me.

This leads me to examine other ways in which we may walk strange lines where species can meet, especially where those meanings are enabled by technology. I do not want to position AR, VR, or any other technology as a replacement for being outdoors, but in some situations, what is outdoors is inaccessible or harmful to be around. Many outdoor experiences are inaccessible to people because of physical limitations. Even more are inaccessible because of financial limitations (for most of us, at least). Some phenomena are inaccessible because they take place over time that we cannot observe or in ways that no human can observe (such as the nitrogen cycle). In situations like this, technologies provide trails for us to walk. The degree to which we may encounter "other species" depends (at least to some degree) on how performances are represented. AR and VR apps provide trails for us to walk, whether it is walking us through a modified world or a completely mediated world.

Perhaps this all sounds a little too much like *The Matrix*, trying to replicate the actual world down to performances of materials. But if that is the case, I want to point to how we rely on technology for viewing and understanding natural phenomenon in more common practices. Whether it's macrophotography from the hobbyist hiker, scientific instruments that allow us to detect phenomenon that would be utterly undetectable otherwise, or super computers that allow us to run climate simulations and project into the future, we already use technology to enhance our ability to see, understand, and plan

for our interactions with nature. Looking for interactions between ourselves and representations of nature in AR and VR apps simply draws attention to how we are (or are not) paying attention to material performances in these forms of communication.

I'll give just one more example of how performances could inform interactive media. In an article about animals living in zoos, Rothfells (2009) discusses the importance of relationships between animals and their keepers. These relationships rely on a lot of attention and curiosity about the animals' actions. In one example, a keeper asked to modify the exhibit so that it was easier on a geriatric jaguar's joints. The zookeeper asked for this not because of the jaguar's age, but because they noticed the jaguar's different behavior. This attention to performances granted a jaguar the ability to influence their dwellings. Rothfells advocates for this approach in thinking about how animals should be treated, writing:

> It was simple thoughtfulness that lead to the lowering of the jaguar's platform in the plans, but I think that sort of thoughtfulness needs to become a more central part of our inquiries, absent as it understandably is in the stark photographs of animals in 'sad' -nonnaturalistic-cages.

Similarly, interactive media acts in "non-naturalistic" environments and even presents "non-naturalistic" species. Replicating these kinds of encounters in AR and VR can prompt us to ask the right questions, such as positioning ourselves as curious listeners that can lead us to practicing performance ethics.

My point here is that representations of nature can draw our attention to their performances. When this is a photograph, video, or other "capture" of nature, this is

easier to see. However, none of the apps I am analyzing in this dissertation use actual images from nature. Instead, they use artistic renderings of actual places (like the arctic) and of animals. I still consider these apps to be a tracing of places and animals because they seek to represent these animals in an authentic way—these are not Pokémon. So, how these representations do or do not include performances is of concern for designers and for me as a researcher.

**Summary**

In this chapter I discussed many different theories, from criticism of environmental communication in the public sphere, to an ethics for interacting with actual pets and how it may apply to other dominance relationships, to discussions of material performances. Laying out these theories and explaining how they are relevant to AR and VR were two of the primary tasks of this chapter. The other primary task is to address how I bring them together and use them for my research questions, which I will conclude with here. The details of my methods will be laid out in the next chapter, so in this section I will only address how I will apply the theories I have introduced in this chapter for my research.

To answer my first research question, *What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?* I apply a modified game analysis to three apps: *Safari Central, Wildeverse*, and *National Geographic: Explore VR*. I have chosen apps that center around photography and the camera in AR and VR because it is a reoccurring mechanic that frames the user's interactions and sometimes literally frames their experiences. Though the camera in VR

is not an actual physical camera, users interact with it like one. Besides an occasional

vibration from a controller (which can be an important design) touch in VR is typically

not a kinesthetic touch. The illusion of touching objects is a kind of haptic visuality. For

AR, there is an actual camera and actual environment for a simulation to interact with.

Sometimes this environment is the user's own face. This is of particular interest to me

because of how gaze is facilitated. Additionally, AR includes touching a screen and any

vibrations that their phone may make. For my analysis, I look at touch on the screen as

well as haptic visuality as a kind of touch, but it is important to recognize that these are

two very different kinds of touch. To pay attention to surfaces, where photographs direct

our attention, and touch, I apply methodology that Aubrey Anable (2018) develops for

her game analysis.

Moving to my second research question, *How can these designs [AR and VR

apps] be revised or leveraged for more beneficial environmental communication through

care ethics?*, I will be relying more on the theories I have presented in this chapter. My

approach of care ethics prioritizes connections over rules for ethical interactions. In this

case, connections are between users and representations of wildlife. Using an ethics of

care also prioritizes looking at the qualities of caring interactions. This includes what

kinds of experiences and information they include, such as grieving with others.

Applying an ethics of care also means that I am concerned with what is done in the name

of care, such as harm or burdens on care givers.

Looking at how care may be facilitated in ways that cause harm, I turn to Bekoff

and Marks. They have already pointed to how representations of wildlife often undermine

connection by "unwilding" people or "petishizing" animals. In other words, representations of wildlife often suffer from overidentification, themes of dominance, and overrepresentation of certain features. These are qualities that I trace when analyzing how these apps attempt to facilitate care between their users and wildlife. However, I do not stop with these theories. Informed by a new and feminist materialist theory, I look at how these apps include or exclude the performances of wildlife and wilderness. Coming from a new and feminist materialist lens, I see AR and VR as a technology with a unique actant power because of how act on/with/as us physically. Physical immersion is not a technoscientific solution to our most pressing problems, but it is something that can intra-act with bodies in a way that offers unique affordances that are especially useful for environmental communication. I direct attention to what kind of performances these apps try to engage users with.

What is most challenging about applying intra-action to these AR and VR apps is that I am concerned both with the material interactions of these physically immersive media (the technology itself) *and* how the performances of nature are represented. What makes these apps particularly useful for a discussion of performance is that these experiences are not works of fiction: they trace actual places and animals. In these representations, I look at how performances of wildlife and wilderness try to match the animal or material performance that they trace. Analyzing how the technology interacts with the design and representations is central to my research. This means focusing on the means of engagement and interaction, which for these apps is centered around photography and the camera.

Sindelar 119

CHAPTER FOUR

METHODS: ADAPTING GAME ANALYSIS TO AR AND VR APPS

When I first began this research project, I had planned to collaborate with the Virtual Reality and Nature Lab (VRN Lab) to conduct participant observations and interviews with users. However, shortly after submitting an IRB with my dissertation chair, the Covid-19 pandemic began here in the US. There was a brief period of time during the Summer of 2020 when it seemed that the pandemic may come to an end by masking and staying at home. By late summer, however, it was clear that this would not happen. I revised my research plan because in-person VR research was difficult during this period. Research was not impossible, but I would have needed to make many adjustments. For example, the VRN lab was able to conduct some research on other projects. The VRN Lab used UV cleaning equipment and conducted research by letting participants take their Oculus Quest equipment home and complete surveys about their experiences. However, when I needed to make a decision about my research, there was limited knowledge and still many questions, such as how the virus spread and the efficacy of masks. Additionally, I needed to teach remotely to protect immune-compromised family. For these reasons, I chose not to conduct participant observations and interviews. These methods are clearly important ways of conducting research, and I plan to return to them in future projects. For my dissertation, however, I chose to analyze these AR and VR apps using textual analysis.

Analyzing games as texts means regarding them as "complex and multimodal signs that are constituted by other signs" (Mäyrä, 2008). Often specified as discourse

analysis, it can focuses on "uncovering how conventions in language (or in games, when they are considered media) make certain ways of representing or thinking […] appear as self-evident and natural, even if they carry certain power relations within them" (Mäyrä, 2008, p. 157). However, textual analysis can more generally draw from other conceptual tools, such as discussions of character, narration, theme, arc, point-of-view, to form its own assemblage of humanistic game study methodology. The difficulty in analyzing these apps as text was finding a way to pay special attention to their interactive designs and unique affordances. Despite my best attempts, I could not find any scholarship on analyzing AR and VR apps as a text to serve as a model or my project. That's not to say that it hasn't been done, but rather that I could not find any methodology to help guide analysis towards their unique qualities. This was not surprising to me because these are still emerging forms of media. What I did find a lot of, however, was game scholarship on how to analyze games as texts. Summarizing this, Doug Eyman and Andréa David write:

> Much of the current research and academic work that addresses computer games focuses on how to read the games as texts or examining the effects of games on game players. Scholars who take these approaches are primarily writing *about* games as viewed from a variety of contexts. Most writing about games draws on one of the three main approaches: psychological effects, literacies of/and gaming, or a cultural studies examination of the social and institutional structures at play in various games and game worlds. This third approach—cultural studies of

computer and video games—is the most prevalent form of game studies research

in rhetoric/composition fields" (Eyman & Davis, 2016, p. 9)

Like others coming from rhetorical fields, I also found myself drawn to the cultural

studies focus rather than the psychological effects or literacy.

Methods should serve research questions, not the other way around. Even though

my methodological options were limited by the pandemic, I wanted to keep the spirit of

my initial inquiry: *What we can learn about existing environmental communication in AR*

*and VR to benefit future endeavors?* Previous studies have discussed framing through

narrative (S. J. Ahn et al., 2015) or the importance of matching natural settings with

corresponding audio (Annerstedt et al., 2013), but a critical discussion of how natural

environments and wildlife are selectively captured through video or created through CGI

and how these designs fit specified goals needs to be developed. Adapting game analysis

methods presented an opportunity to address this gap and develop that conversation. This

adaption led me to my research questions:

- RQ1: What kinds of relationships are facilitated between users and
  representations of wildlife by designing around photography in AR and VR?
- RQ2: How can these designs be revised or leveraged for more beneficial
  environmental communication through care ethics?

These questions keep with the spirit of my inquiry, work within the strengths of

my methods, and leverage the strengths of game analysis by focusing on the interactive

designs of these apps. In this chapter I will discuss the methods that I will be using to

answer RQ1. My answer to RQ2 will be informed by answer to RQ1 and engage the

theory that I introduced in chapter two.

The first section of this chapter discusses games scholarship and relevant research

methods. This includes a discussion of important terminology as well as popular,

conflicting approaches and theories. I explain why I chose to apply Aubrey Anabel's

feminist materialist approach to game analysis and Consalvo and Dutton's toolkit for

additional structure. In the second section I explain my own research design. My research

design includes playthroughs of AR and VR apps (*Safari Central*, *Wildiverse*, and

*National Geographic: Explore VR*) so that I may analyze how designing around the

camera may facilitates certain relationships with wildlife. I conclude the chapter with a

short summary of my methods, research plan, and what I hope to learn from completing

them.

**Where and How to Look for Meanings in Games**

The apps that I am analyzing work well with game studies because they include

playfulness through posing Figures for photos, exploring new areas, and solving

problems. None of these apps involve passive watching, so this is not like "playing" a

movie. Rather, when users engage with these apps, they are being playful with their

interactions. They are interactive and rely on digital simulations like videogames do.

Applying game analysis to these apps requires understanding that they do function a little

differently from games and modifying my analysis accordingly, which I address later in

this chapter. Still, game studies provides a foundation that emphasizes interactivity and

digital simulations. In these apps, the camera is the central mode of engagement. Focusing on camera-centered apps presents several advantages.

First, the camera as a central mode of engagement is a reoccurring game mechanic (Webber, 2019), and its prevalence extends to AAA games (a classification of high-budget, high-profile games), including Nintendo's *Super Mario Odyssey, Animal Crossing: New Horizons,* and *The Legend of Zelda: Breath of the Wild,* and all of the recent main *Pokémon* titles. Of course, some games are built around this mechanic. *Pokémon Snap*, originally released in 1998, is arguably the most popular photography game to date. It was rereleased for Nintendo Switch in 2021, and sold over 2.07 million copies outside of Japan in the first year (Japan's release numbers are not public) (Life, 2021). In this game players attempt to complete the Photodex (instead of Pokédex), which is a collection of pictures of all the Pokémon in the game. The camera as a form of engagement has also been studied in other game scholarship for its ability to help users think about composition in photography (Poremba, 2007).

The second advantage of focusing on camera-centered design is that the camera adds a frame around a media form that is lauded as "frameless." And third, it draws the user's attention to surfaces of representations (what they are taking photographs of) and the surfaces of their interface (screens in AR and the illusion of a viewfinder in VR). This focus on surfaces is interesting because it is physically centered in a physically immersive media. These apps use the unique affordances of physical immersion to create meaning for the user, which brings me to one of the principal (and principally debated) topics of game studies: how meaning is made.

It is important to recognize the differences between games and other forms of media. To suggest that people interact in the same way between different forms of media, such as graphic novels, books, movies, and music, ignores their different sensory and cognitive experiences. What is more difficult to recognize is *how* games should be understood differently. To suggest that games are so different from other forms of media that they can *only* be understood from a ludological approach ignores shared cultural context and similarities between different forms of media (Consalvo, 2008). As Mia Consalvo explains,

> Many scholars have argued for a ludological approach, which sees games as distinct from other media and technology forms. Such an approach is necessary, they believe, to account for the distinctiveness of digital games—their interactivity, their reliance on rules, their formal structures. While this approach is useful to a certain extent, we can also draw from, while carefully adapting, other theoretical lenses from established fields and disciplines in order to better understand the multifaceted nature of games, and their production and reception. (Consalvo, 2008, p. 296)

What Consalvo is challenging here is the "ludology" side of the much-discussed ludology versus narratology debate, which generally constructs games as something that only make meaning through a narrative or only make meaning through their ludological design (Murray, 2013). Despite its being a popular topic of discussion in games studies, the extent to which there was a "debate" with distinct "sides" is unclear. Gonzalo Frasca considers the debate a misunderstanding, at least in the situations where "some scholars

believe that ludologists hold a radical position that completely discards narrative from videogames" (Frasca, 2003, p. 5). Frasca points to Marie-Laure Ryan who argues that ludology should include narratology.

Similarly, some scholars point to ludologists as inventing the controversy around how games should be studied. In Janet Murray's article "The Last Word on Ludology vs Narratology," she writes:

> Those interested in both games and stories see game elements in stories and story elements in games: interpenetrating sibling categories, neither of which completely subsumes the other. The ludology v narratology argument […] can never be resolved because one group of people is defining both sides of it. The "ludologists" are debating a phantom of their own creation. (Murray, 2013, p. 3)

Though some scholars have taken different paths to get there, many game scholars agree that ludology and narratology are both necessary and, additionally, that game studies can carefully apply theories from other disciplines. What seems to be a more pressing question is how determinate meaning is in games.

To whatever degree that the narratology vs. ludology debate occurred and resolved itself, it finds itself within a larger debate of where meaning resides or emerges in games. The two major categories for analytical gameplay are structural gameplay analysis, which looks at game rules and interactions to reveal processes that have the strongest influence on gameplay, and thematic analysis, which reveals central ideas by the total game experience and its interpretation (Mäyrä, 2008). Games scholarship has a long history of relying on a formalist, prescriptivist theory, as Anable explains, games

scholarship: "tends to emphasize 'rules,' specifically algorithms, as the site where video games' expressive potential can most meaningfully be traced" and this is a result of scholars who were "eager to distinguish the field from literary or media studies" (2018, p. 47). Game analysis emphasizes the differences between games and other texts by accounting for the ludic aspect, but it does not need to be fully prescriptivist. This ludic emphasis opens play as an interpretive action, which is important for avoiding a purely formalist approach (Sicart, 2011). However, game analysis has often been focused on looking beyond surfaces, such as within the code, how rules combine to make meaning, or what games say through text and speech. This has moved researchers away from studying representations on a screen and beyond the surface of human touch.

Aubrey Anable applies feminist and queer methodologies, mostly drawing from Karen Barad and Sarah Ahmed, to question whether researchers need to go beyond the surface of games into the code, ludic constructions, or elsewhere. Anable writes:

> The modest question I pose, however, is this: Do we have to go that deep—to look beyond the represented world—to feel entangled? In other words, when we tap and rub our fingers across the images of *Sword & Shield* [an mobile game that she discusses earlier], do we need to understand quantum physics to reveal the queer entanglement of the experience, or is entanglement, if you'll excuse the pun, already felt in the matter at hand, the surface affects (rather than surface effects) of representation? (2018, p. 65)

Anable invites researchers to apply game analysis to study the everyday entanglement as a material surface, a space of representation, and an affective assemblage. She recognizes

how the binaries of surface/depth, representation/computation, and hidden/reveal have devalued these everyday assemblages. Instead, she proposes "a model that attends to surfaces—of screens and bodies—not as sites of secondary expression but rather as crucial sites of touch and entanglement, where representation still matters and representation is *matter*" (Anable, 2018, p. 46). In other words, her methodology focuses on surfaces of within games, surfaces of material objects, and their entanglement with user bodies.

Aubrey's methodology has interesting applications for AR and VR, where the sense of self or the world is fundamentally altered through partial or complete simulations. Notably, many VR apps have moved towards recognizing hand gestures instead of relying on controllers. Though users may be grasping at air, the idea of touching something can be so strong that users often lean their bodies against virtual objects and accidentally start free falling. *National Geographic: Explore VR* is not a game that has hands-free controls—it uses the tracked Oculus controllers—but haptic visuality is still relevant. As I addressed in the previous chapter, haptic visuality is a multi-sensory way of looking and it often resists identification with the object of focus. Anable also includes Laura Marks' idea of haptic vision in her consideration of touch, but she also includes kinesthetic touch for screens, controllers, keyboards, or other materials.

Anable offers several examples of using this methodology with game analysis. Interestingly, one of the games she uses is a critique of VR. *The Empathy Machine* is a text-based game where the creator, named only "k" (not capitalized) calls into question the validity of relating to someone else through a VR experience. k, a transgender

woman, created this game in response to illusions of swapping bodies into another gender or race in VR. In *The Empathy Machine*, k questions whether empathy should be based on trying to inhabit another's experiences or if it should be less focused on subsuming differences. At one point in the game the text prompts the player to put their hand to the monitor. Anable methodological approach allows her to pay attention to how this surface, material interaction in meaning-making. She writes, "the technological simplicity of k's game and its insistency on putting the players hand in direct contact with a computer screen are part of the designer's critique on the normative assumptions that continue to shore up the fetishization of simulation and immersion in digital media" (Anable, 2018, p. 47). k's game and Anable's reading of it hold important critiques of what designers and users desire from VR interactions, but relevant to this discussion is how Anable's methodology discloses meaning making in a way that most game analysis could not.

Some game scholars, such as Mäyrä (2008), claim that a game is what doesn't change when the surface is changed—in other words, the rules that dictate interactions on the surface. Anable refutes this claim, arguing that "gameplay *is* the interface in a significant way" and that "video games demand that decisions be made at interface where the player has access to a set of instructions (the rules, the narrative, the images) and the game has access to its own set of instructions (the code)" (Anable, 2018, p. 52). Anable's methodology for game analysis brings how and why touch and embodiment are important for games into focus rather than looking past it.

The methodological approach that Anable offers, though new to game analysis, draws from feminist materialism and lends itself both to the theory I introduced in

chapter two and to my research questions. Perhaps even more interestingly, this approach

works for my focus on how photography frames experiences in these apps. Because

photography games bring the user's attention to the screen of the game, the surface of the

experience is inherently foregrounded and vital to the overall experience. This is not a

neutral space in games scholarship because "in game studies, the screen is the arresting

and distracting feminine surface that obscures the deeper space of action and masculine

probing of code" (Anable, 2018, p. 53). These apps use photography game mechanics to

draw users' attention to this surface, and Anable's methodology is equipped for

disclosing the meaning making practices of it by focusing on these surfaces.

        Anable enacts her methodology by completing playthroughs of games. Almost all

scholars agree that playing games is an essential part of analyzing them, whatever

methodological lens a researcher chooses (Mäyrä, 2008, p. 165). At the same time,

however, it's important to emphasize that one playthrough is not representational of all

playthroughs. Playthroughs generally describe fragmented play sessions of games.

Fragmented play sessions include varying amounts of time over several sessions, similar

to how "literary critics conduct 'readings' of a novel and film critics' 'viewings' of a

film" (Jennings, 2015, p. 7). Many games (and simulations) provide far more options

than a player (or user) could practically (or in some cases, physically) ever play. This is

especially true for AR, where a game could be played anywhere on earth, with each

location providing a unique experience. How would a researcher choose which part of the

world to overlay the experience onto?

Researchers acknowledge the partiality of playthroughs, recognizing both actualized textualities and potential actualities. Jennings (2015) summaries actualized and potential actualities, and how they work together, in game scholarship:

> Actualized textualities are the play sessions in which the critic participates and performs. They are sets of potential textualities condensed into moments of play. They are the choices that the critic makes, the outcomes they experience, the flow of play throughs. […] Actualized textualities do not construct the game text on their own. They and potential textualities are not mutually exclusive and do not create a dichotomous binary. Even if critics read only their collected actualized textualities, they must attempt to preserve an awareness of the potential textualities that may have come into existence during moments of play, but which they did not experience. In doing so, they acknowledge that their experiences of the game are necessarily incomplete and represent only parts of the textualities and interpretations that a single video game may support. (Jennings, 2015, p. 10)

Potential actualities often far exceed what can be study in a single playthrough and even what could practically be observed in multiple playthroughs. For example, a single world in the PC version of *Minecraft* is 64,000 kilometers from one end to the other—more than five times Earth's diameter (12,742 kilometers). Additionally, it has more than eight times the surface area of earth (Farner, 2019) and it would take a player 824 hours of continuous walking to reach the edge of the universe in a completely flat world with no obstacles (Parkin, 2014). While *Minecraft* is particularly large, the sheer number of ways

a player can actualize a playthrough almost always exceeds a researcher's ability to study actualities.

The apps I analyze present more playthrough options than I can practically or physically complete. This is especially true when considering photography as a game mechanic. It is impossible to capture every possible in-game image. My playthroughs only comprise of a small fraction of potential actualities, but this awareness will inform my analysis of actualized playthroughs that I complete. For example, in *National Geographic: Explore VR* the user must make choices about how to steer the kayak. Even though my playthrough will present one actuality, I take note of the setting and how there were choices available.

As the above example shows, note-taking is important for my playthroughs. Though Anable's methodology is foundational for me, I decided my approach would also benefit from additional structure, which I adapt from Consalvo and Dutton's (2006) toolkit. More structure will help me pay closer attention to the many surfaces and points of interaction in these apps with more rigor. Consalvo and Dutton's (2006) toolkit includes creating an object inventory, interface study, interaction map, and gameplay log for a playthrough. Though Consalvo and Dutton do not write about surfaces or representations as meaning making in the article that introduces this toolkit, they do present a detailed way to trace surfaces and interactions through their four note categories.

Object inventories are a "catalogue of all known objects that can be found, bought, stolen or created," with "a detailed list or spreadsheet that lists various properties

of each item" (Consalvo & Dutton, 2006, p. 4). I will expand this to include other "tools" the user may start with. This will help show what interactive elements compete with the camera. An interface study is "defined as any on-screen information that provides the player with information concerning the life, health, location or status of the character(s), as well as battle or action menus, nested menus that control options such as advancement grids or weapon selections, or additional screens that give the player more control over manipulating elements of gameplay." (Consalvo & Dutton, 2006, p. 4). This is obviously centered on videogames, but in the apps that I am analyzing this will still catalog conventional and non-conventional menu buttons. For example, in *National Geographic: Explore VR*, some menu items are not button or drop-down menus but sorting boxes (to mimic sorting in real life).

An interaction map includes logging dialogue and other interactions. Consalvo and Dutton recommend to record "dialogue of note that occurs in the game" and that "well-defined research questions help the researcher identify dialogue/choices of interest and focus in on those" (2006, p. 7). *Safari Central* lacks dialogue altogether, but the other two apps use it intermittently. Finally, the gameplay log "tracks what can happen when the player does something the game maker did not intend and with what result" (Consalvo & Dutton, 2006, p. 9). This approach tends to favor a more prescriptivist approach by assuming what the creator intended (and how it does or does happen) is most significant. Instead, my gameplay log will note instances of touch, haptic visuality, and camera use.

Other scholars have used and expanded Consalvo and Dutton's approach, but there is some disagreement on what this approach actually offers. As Bizzocchi and Tanenbaum explain, this method "is very similar to close reading, however [Consalvo and Dutton] don't situate it within a broader methodological tradition" (2011, p. 290). Bizzocchi and Tanenbaum go on to claim that the toolkit "does not present a comprehensive analytical technique for games researchers [but] constitutes a set of possible analytical lenses for studying games (2011, p. 290). Conversely, Christopher Paul explains them as tools to identify aspects, stating that both approaches in these articles are useful but, "they are more aimed at identifying aspects of a world one needs to investigate than providing a clear way to engage in analysis" (2012, p. 7) Here, I agree with Paul. I see the "methodological toolkit" that Consalvo and Dutton present as a method for identifying aspects of a games (and apps) rather than analyzing it with a particular lens (methodology). Instead, Anable provides a methodology, and I have tweaked their toolkit to reflect that methodology.

Game studies has many competing approaches to methods and methodology, which often are not focused of the materiality of things and do not find meaning in surfaces of screens.[7] However, the recent scholarship from Anable defies these norms by focusing how matter *matters* and recognizing how players interact with and make meanings with the surfaces of and representations in those games. Looking for a more

---

[7] Frans Mäyrä (2008) presents detailed descriptions of both humanities-based textual analyses and social science-based research studies. These typically include some kind of playthrough, analysis of code, or empirical tests.

structured way to apply this methodology, I am adapting Consalvo and Dutton's toolkit. My modifications to the toolkit reflect my methodological lens and research questions. In the next section I outline my research design.

**Research Design**

To answer RQ1 (What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?), I completed playthroughs of National Geographic: Explore VR, *Safari Central*, and *Safari Central*. As I completed each playthrough, I created an object inventory, interface study, interaction map, and gameplay log. These notes are available as *Appendix I: National Geographic Explore VR Notes, Appendix II: Wildiverse*, and *Appendix III: Safari Central* at the end of this dissertation, and they are summarized in the next chapter. The note sections have been modified from Consalvo and Dutton's (2006) toolkit use Anable methodology and my focus on other interactive media. In the next section, I explain more details about note types in the section and summarize them in Table 4.1: Analysis Note Types.

*Safari Central*, *Wildiverse*, and *National Geographic: Explore VR* are not equal in content or playtime. I have chosen two AR apps from Internet of Elephants because when combined they offer about as much content as *National Geographic: Explore VR.* Consequently, these playthroughs were of very different lengths. These are not challenging apps, so I do not have difficulty completing them. *Safari Central* does include an option to pay for more content at a modest price ($9.99), which is donated to conservation organizations. I did pay for this content to access all experiences in the app,

which only consisted of infinite camera roll. National geographic: Explore VR was $9.99 to purchase with no paid expansion, but one expansion was already included in the purchase, which I included in my playthrough. *Wildiverse* was free, had no in-app purchases, and no expansions.

I completed playthroughs of *Safari Central* and *Wildiverse* on a Pixel 3a phone from Google and the *National Geographic: Explore VR* on the original Oculus Quest. I recorded all of my information using Microsoft Excel on PC and took some notes as I went through my playthroughs. However, most of my notes came from reviewing my recordings. I recorded my playthroughs on my phone and computer using a free apps (XD Recorder and Screencast-O-Matic respectively). After I completed my playthroughs, went back through the apps to create an object inventory and interface study for each app. I then went back through my recordings to complete my interaction logs, and gameplay logs.

*Note Types*

Interface studies catalogue any on-screen information that provides the player with information concerning the life, health, location, or status of the character(s), as well as menus screens that give the player more control over manipulating elements of gameplay. Since My methodology focuses on touch, this will also include a catalogue of controls that I kinesthetically touch, such as a phone screen or Oculus controller, and a description of those physical interactions. The columns in the interface studies included:

- Place in App, with descriptive answers

- Menu Item, with descriptive answers

- On-Screen Image, with descriptive answers

- Effect, with descriptive answers

- Other Information Provided, with descriptive answers where applicable

- Place in Area, with descriptive answers

- Physical Interaction Type, with descriptive answers

- Other Notes, with optional descriptive answers

Interfaces may seem mundane in apps, but like most things that fade into the background, it has tremendous power in shaping our perceptions and actions. The interface also prompted the user to move in physical space, sometimes tracking their motions and sometimes tracking their change in position. I considered these motions as a part of the necessary interaction with space. While these motions weren't always touch with the screen, it did require holding (touching) a device and moving it around in physical space. These motions and touch with devices make interfaces an important part of immersion and camera use in these apps.

Object inventories catalogue all known objects that the user can interact with or be collected in the game. This includes their various properties, such as effects, value, and ability to share or trade. The columns of the object inventories include:

- Object, with descriptive answers

- Effects, with descriptive answers

- Value, with descriptive answers

- Sharable, with yes/no answers; tradable, with yes/no answers

- Other Details, with optional descriptive answers.

I regarded objects in these apps as touchable, affectable figures in the app. Buttons, sliders, and overlays I considered specialized forms the app's interface, not objects.

Interaction logs catalogue interactions, including dialogue, using a camera, and other interactive experiences. The columns in the interaction logs include:

- Touch Type, with descriptive answers (N/A noting where touch did not occur)

- Camera Use, with Yes/No answers

- Interaction, with descriptive answers

- Details, with descriptive answers

- Other Notes, with optional descriptive answers

Touch-based interactions were catalogued in this section *only* when they were required by the app to progress in the playthrough. These interactions *and* other touch-based interactions were catalogued in the gameplay logs. In future studies using this method, I would only have touch-based interaction only catalogued in one place and include an additional column for whether it was necessary for the playthrough or not. However, I was too far along in my playthroughs to make that adjustment for this study. Consequently, the interaction logs include necessary touch-based interactions and narrative.

Gameplay logs catalogue of instances where touch, haptic visuality, and camera use were a part of the gameplay. Specifically, my columns included:

- Camera/Photos, with Yes/No answers

- Physical Touch Type, with descriptive answers

- Haptic Visual Visuality, with Yes/No answers and more details if Yes

- Details, with descriptive answers

- Other, with optional descriptions of other details

The camera and touch were straightforward to catalog, but haptic visuality is required extra awareness. Haptic visuality can be a subjective experience, but it can also be observed in the design of the game, and by realistically combining motion with visual feedback. For example, adjusting the zoom on a camera with the physical motion[8] that one would perform on an actual camera and seeing the results in real-time. Examples of more subjective haptic visuality include I mistakenly tapped a real surface when I should have touched the screen to move an animal. These mistakes were markers of my immersion and the feeling of being able to engage with digital phenomena in real space. I do not think it is productive to delineate these experience as *either* subjective or prescriptive. As Anable writes, "identifying a video game as an affective system means resisting locating properties like texture, tone, and feeling in a purely subjective experience of reception or as the exclusive property of a text, and instead locating them in the slippery and intellectually fraught place in between" (2018, p. xiv). This is an important part of my analysis, and my methods includes marking this fraught place in between.

---

[8] The physical motion for adjusting zoom on DSLR camera, which is what I am referring to here, typically involves extending and retracting one arm.

**Table 4.1**

*AR and VR Analysis Note Types*

| Note Type | Description |
|---|---|
| **Interface Study** | A catalogue of any menu screens or other on-screen information that provides the player with information concerning the life, health, location, or status of the character(s). |
| **Object Inventory** | A catalogue of all known objects that the user can interact with or be collected in the game. This will also include their various properties, such as effects, value, and ability to share or trade. |
| **Interaction Log** | A catalogue of interactions, including dialogue, using a camera, and other interactive experiences. |
| **Gameplay Log** | A catalogue of instances where touch, haptic visuality, and camera use were a part of the gameplay. |

**Conclusion**

Some game scholars have come to see how game studies can work with other

fields of study without ignoring the unique aspects of games. Of these scholars, I am

drawing mostly from Aubrey Anable, Mia Consalvo, and Nathan Dutton to apply their

methods to other interactive media, with modifications. Anable's uses her methodological

approach to game analysis to observe how games use touch to call into question how

much we can understand about another person through a game or simulation. This ties

into scholarship on AR and VR because the necessity to create physical immersion,

proprioception and other bodily phenomenon are critical design considerations. Consalvo

and Dutton provide a toolkit that adds more structure to my analysis. Their toolkit traces

what the player sees and how they interact with the game. I have modified their toolkit to

accommodate Anable's methodological lens and my research questions about AR and

VR so that the most prescriptivist portion is replaced with a study on touch and haptic

visuality.

CHAPTER FIVE

RESULTS: RELATIONSHIPS FACILITATED BETWEEN USERS AND
REPRESENTATIONS OF WILDLIFE AND WILDERNESS

When I envisioned writing this chapter, I imagined carefully reporting nuances in

the way that photography was used to facilitate care. I also imagined reporting mixed

results, where photography was sometimes not leveraged to facilitate care or occasionally

used in ways that did not support goals of the app. However, as I began writing my

playthrough notes, I realized that my results were presenting something quite different.

Photography, camera use, and touch all did not contribute to facilitating care and

connection in the ways that I would have expected. These surprising results speak to the

ability of adapting game analysis to AR and VR apps for disclosing the ways in which

touch and surfaces of screens do or do not facilitate experiences and relationships.

This chapter summarizes the results from my playthroughs, which answers my

first research question: *What kinds of relationships are facilitated between users and*

*representations of wildlife by designing around photography in AR and VR?*. The results

of my playthrough show that *National Geographic: Explore VR*, *Safari Central*, and

*Wildeverse* facilitate researcher/subject and patron/recipient relationships between users

and representation of wilderness and wildlife. My results also show how these

relationships are underdeveloped and preclude curiosity. Additionally, these designs do

not leverage photography and the camera to build out these relationships. Instead,

photography and the camera are often in service to relationship building through tasks

and dialogue. In the next chapter, I discuss these designs in more detail and present

alternative approaches.

As I address in this chapter and in the next, photography and camera are affected by other elements of playing these apps. The interface affects what users can do in the world, including take photographs. Interfaces can also function as a barrier to photography and invite users to alter their world in ways that give them unrealistic control over wildlife and wilderness. Dialogue explains concepts and information that the app creators deemed important enough to explain in depth. Dialogue also situates what users are seeing and why it is significant to capture images and interact in the world. Interactions compete with as well as compliment opportunities for capturing photographs. As I discuss later, events with action sequences can frame interactions. Overall, how the apps create a (complete or partially) simulated world is inherently relevant to the opportunities to capture photos within and of these simulations.

I briefly describe the structure of *National Geographic: Explore VR*, *Safari Central*, and *Wildeverse* in the first section below. Then, I summarize the findings of all three apps by note type: Object Inventories, Interface Studies, Interaction Logs, and Gameplay Logs. For each note type, I first provide an overview of the results and then discuss each app in more detail. For full details, Excel sheets with all of my lines of notes are available as *Appendix A: National Geographic Explore VR Notes, Appendix B: Safari Central Notes*, and *Appendix C: Wildeverse Notes* at the end of this dissertation. I conclude this chapter by summarizing how these findings address my first research question. My playthroughs show that despite designing around a camera and photography, representations of wilderness and wildlife and their surfaces (either seen on a phone screen or in the Oculus goggles) are not leveraged as sites to facilitate care.

Care—which I identify in connection, being subject to unsettling curiosity (Haraway, 2013), and actions to benefit others—are facilitated through other means. Designing around photography and the camera facilitated solely researcher/subject and patron/recipient relationships that were underdeveloped and precluded curiosity. This insight guides my response to my second research question, which is taken up in the next chapter.

**App Overviews**

*National Geographic: Explore VR* is organized around three places: base, the Antarctic Peninsula, and Machu Picchu. The base is an indoor location—seemingly an apartment—where the user begins. From the base, the user can embark on an "assignment" from National Geographic that takes them to either the Antarctic Peninsula or Machu Picchu. These two locations have the same controls and overall purpose in the app—where the player is capturing photographs for an upcoming issue of National Geographic Magazine—but the objects, interaction, and gameplay itself varies drastically between the two locations. Additionally, the Antarctic Peninsula assignment has the additional purpose of documenting research. This "research" includes tracking a colony of emperor penguins and documenting any other animals found along the way. The Machu Picchu assignment was a later addition to the app, so its departure from research documentation is an interesting choice. Instead, users are prompted to replicate the photographs of Yale professor Hiram Bingham, who the app credits with re-discovering

Machu Picchu. The app also acknowledges that local people were already living in

Machu Picchu when he "rediscovered" it.[9]

     *Safari Central*, created by Internet of Elephants*,* is organized around six different

animals: Rockstar, a pangolin; Mweturia, an African elephant; Atiaia, a jaguar; Ethyl, a

grizzly bear; Lola, a black rhino; and Beby, a lemur. There is no storyline or stated

exigence for taking photos with these animals or for any part of this app. Additionally, in

contrast to the other two apps, there is no narrator. The desire for taking photographs is

entirely user guided. No part of the app tells the user why they should want to take

photographs or why they might need to do so. Posing with animals and accepting the

invitation to "rewild your world" is all the motivation that this app relies on. However,

the app does provide the user with information about the animals through strategically

placed buttons that trigger in-app pop-ups or links to other webpages outside of the app.

This app also stands apart from the other two apps discussed here in that it includes in-

app purchases ranging from $.99 to $9.99 for additional photographs, which go to the

conservation organizations that partner with *Safari Central*.

     Internet of Elephant's second AR app, *Wildeverse*, is the successor to *Safari*

*Central*. *Wildeverse* is themed around four different animals: Fio, an orangutan; Buka, a

gorilla; Chilli, a gibbon; and Aida, a chimpanzee. The premise of this app is that forests

are scanned to populate the "wildeverse." Users go into the wildeverse when they overlay

---

[9] One of the narrators, Natalie, says: "When Bringham found this house, someone was using it! They had a make-shift roof." Despite this acknowledgment, these local people are not credited with anything, and their absence is a part of what enables tourism to this historic site. The erasure of these local people is notable and stands in contrast with treatment of local populations in the app *Wildeverse*.

"the scans" onto their world, where they collect data by (again) scanning objects and animals in the forest. When I write about experiences in "the wildeverse" I am referring to these simulations, not any other part of the app *Wildeverse*. Additionally, the wildeverse is accessed by through a tab also called "wildeverse." When referring to the tab, I explicitly state "the wildeverse tab." The wildeverse tab is one of the three main tabs in the app. The other two are a chat tool and a journal. The chat log consists of the user and five non-player characters (NPCs) texting in a group chat. The user's ability to steer the conversation varies. In some cases, the user can choose from two or three replies, and other times there is only one reply option. The app requires repeated touch with objects (by tapping the screen) to scan them in the wildeverse. While the wildeverse app is aspirational in its goals, addressing very serious environmental topics and linking users to public scientific data, there is a wide gap between the efforts made in the dialogue and the interaction with surfaces in the wildeverse.

Wildeverse also requires further consideration of how the camera is used. The app situates and encourages photography, but scanning objects is required to progress in the app. In the wildeverse, users help other researchers collect data on four primates by scanning the animals themselves, their food sources, their droppings, their tools, human litter, and man-made tools that measure or enrich the environment. To this end, the camera acts as a scanner as well as a photography tool in the app. Scanning is significantly different from capturing photographs in the app. Most notably, capturing a photograph provides visual documentation while scanning only provides information that is never visualized. Scanning in the wildeverse uses the camera, but it provides no visual

information. This is an important difference (that is differently rewarded) that I will

return to throughout this chapter and the next.

**Interface Studies**

My interface studies catalogued on-screen information that provided the user with

information concerning the life, health, location, or status of the character(s), as well as

menu screens that give the player more control over manipulating elements of the app. A

screenshot of these notes is shown in Figure 5.1 below. Since my methodology focuses

on touch, this also includes a catalogue of controls that I kinesthetically touch, such as a

phone screen or the Oculus controller, and a description of those physical interactions.

The columns in the interface studies include place in app, with descriptive answers; menu

item, with descriptive answers; on-screen image, with descriptive answers; effect, with

descriptive answers, other information provided, with descriptive answers where

applicable, place in area, with descriptive answers; physical interaction type, with

descriptive answers; other notes, with optional descriptive answers. These interfaces

affect how users engage with the photography mechanic as well as the world around them

that may (or may not) prompt them to use the camera. The interface also prompts users to

move in physical space, affecting the user's position for photography.

| Place in App | Menu Item | On-Screen Image | Effect | Other Information Provided | Place in Area | Physical Interaction Type | Other Notes |
|---|---|---|---|---|---|---|---|
| Base | Choose objects | Home in mountains | Opens other options | Displays collectables | Entire | Move to areas | |
| Base - Activity Workspace | Activity select | White table, Globe, mag preview | Displays Activity | Description on left | Center | N/A | "Select a single activity" |
| Base - Activity Workspace | Activity description | White box | N/A | N/A | Left | N/A | "Photograph Machu Picchu, Peru for |
| Base - Activity Workspace | Arrows | Yellow arrows | Toggles Activities | N/A | Left | Lift Right Index + Push virtual button | |
| Base | Phone | Play button, More Info | Plays voicemail; brings up voice chat info | | N/A | Move Hand | |
| Base | Photo Review | Arrows, page numbers, current photos | Pulls up images | share and delete buckets | N/A | Move Hand | Back, remove, remove all |
| Camera | Viewfinder | Smaller view of the world | Enables photographs | Contains frame and visual aids | Entire view | Press Grasping button + Arm position | |
| Camera | Frame | Yellow box | Shows borders of photo | N/A | Center | Move head and body | Also affected by zoom and panorama |
| Camera | Zoom | Visual aid in Viewfinder | Frame size change | N/A | Center | Move Right Joystick | |
| Camera | Panorama | Visual aid in Viewfinder | Frame size change | N/A | Center | Press A button | |
| Camera | Take Photo | Visual aid in Viewfinder | Takes photo | "Photo saved" Preview of saved photo | Center | Press Right Trigger | Mimics regular camera trigger |
| Camera | Zoom (alternate) | Shows left controller | Frame size change | N/A | Center | Press Left grasping trigger | Mimics regular camera zoom |
| Options Menu | Options Select | Settings words | Select Setting | Controllers with buttons notes | Center | Press Options Button | "Pause", "National Geographic Explo |
| Options Menu | Voice Chat | Voice Chat with a friend instructions and visual aid | | | | | |
| Options Menu | Settings | Language, Audio, Subtitles, Narrator Volume, Music Volume, Stick locomotion, Stick Rotation, Profile, Save Data | | | | | back |
| Options Menu | Credits | Movie-like fading in and out credits | | | | | |
| Options Menu | Resume | "Resume" | Resumes game | N/A | Center | Press Right Trigger | |
| Loading Screen | N/A | "Loading" + Tips | N/A | Tips explain menu and other options | In between places in the app | N/A | |

Figure 5.1: A screenshot of my *National Geographic: Explore VR* Interface Study in Excel

Interfaces vary drastically between these three apps. Some touch-based interaction happens with minimal interface. Other times, the interface creates visual screens between the user and animals, restricting not just touch but also sight and available actions. Half of *National Geographic: Explore VR* has very minimal interface and achieves a high degree of realism. The other half acknowledges itself as a simulation and has users engage with many interface options. Both designs have their strengths but using them in the same app creates a conflicting message about the place. *Safari Central* features very little interface but does not represent animals at scale. This presents tension between the advertised goal of interacting with "real" animals" and the lack of realism. *Wildeverse* has a detailed interface with three sections, but it is designed to look like an app that connects users to real animals. Of course, it does do this, but not in the literal way the wildeverse is supposed to work (where users collect actual animal data and chat with researchers in real time). *Wildeverse* tries to look like a real app that could exist in the future. This approach makes its detailed interface a *part* of the immersion, not a layer *between* the user and the simulation. However, this app has its own usability problems that limited the effectiveness of this design.

*National Geographic: Explore VR*

The interface between the world and the user differs greatly between the Antarctic assignment, the Machu Picchu assignment, and the base. The only consistent interface options are the menu and the camera. The menu takes users to controls that are frequently found in games and apps, including: resume, which lets users continue the app; credits, which plays a scrolling credits video; voice chat, which lets users co-operatively talk to

each other as they play the app; and options, which allows users to change their language, audio, subtitles, narrator volume, music volume, stick locomotion, stick rotation, profile, and save data. These options allow for increased accessibility, allowing users to adjust for physical dexterity, language options, and subtitles. Communication and fine motor skills are both important parts of this app, making these options important accessibility features. My playthrough is based on default settings, and a closer examination of the app's accessibility features would require another playthrough and potentially different users. Though I did not use the voice chat during my playthrough, this feature enables a different kind of experiences for this app that could affect the user's engagement with the environment. However, this feature isn't available until after the user has completed both assignments, so this different kind of experience is designed to extend the longevity of the existing content and does not replace the solitary experience users have with the environment during their first playthrough.

The other stable interface throughout this app is the camera. The user's camera is always securely fastened to the user's hip or placed in front of them (as it was while kayaking). Except for a few seconds when the app is playing transitional scenes or when ice climbing, the camera interface is always available. When the user grabs the camera and holds it to their face, the app displays the world as if the user is looking through a viewfinder. The world is suddenly put into a smaller frame with fuzzy black edges. When looking through the viewfinder, the app displays a yellow frame overlay that indicates the edge of the photograph. This camera looks like a DSLR (digital single-lens reflex), but it behaves in a way that mixes a DSLR and a cell phone's camera. Without going too far

into the details of camera construction, a DSLR is what people are used to seeing in professional settings. Whether it's a natural documentary or a sporting event, DSLR cameras have long lenses and square body. DSLRs and their predecessors SLRs (single-lens reflex) carry the aesthetic of professional photography. This an important detail for thinking about what the user touches and how it affects their experience. Changing the photograph's orientation can only be achieved by rotating the user's wrist, as with an actual camera, DSLR or otherwise. Switching to panoramic mode can only be completed by pressing a button, which is more like a cell phone camera.

In some ways, this camera does function like a DSLR. Zoom can be changed by mimicking the movement of adjusting a manual lens on a DSLR, requiring the user to engage both hands while concentrating on their vision's composition. However, zoom can also be achieved by pressing one of the joysticks that more like a cell phone camera, and it even mimics the thumb movement on zooming on popular social media apps such as *Instagram*, *TikTok*, and *Snapchat*. The result of zooming is also more similar to a cell phone's camera. Most cell phones do not feature optical zoom, and the ones that do usually only feature a few focal lengths that extra lenses provide. Optical zoom is a true zoom that provides the same resolution as when it is not zoomed in. Digital zoom, which is much easier to achieve, essentially pre-crops a photo before it is saved. One of the greatest advantages of using a DSLR camera is the ability to zoom and retain photo quality. The DSRL camera in this app does not retain the same image quality when zooming. Instead, when users zoom in, the yellow frame indicating the borders of the photograph is the only thing to change. This may seem like a trivial distinction, but it

prevents users from experiencing different perspectives and detail that DSLR cameras typically provide in professional nature photography. The user is not professional, but the simulation is supposed to evoke the experience of being a professional, including focusing on image composition and the practice of discovery through photography. Omitting optical zoom for a DSLR camera is a significant design choice that forecloses many of the experiences related to capturing photographs, such as discovering what was previously out of sight.

Unique interfaces at the base include only the activity workspace and what I call the photo desk. The activity workspace allows users to read about an assignment and begin it. There are currently only two options (Antarctica and Machu Picchu), but the ability to scroll through options rather than simply displaying the two options upfront suggest that the app may receive updates in the future. Even if this isn't the case, it gave me the illusion that I was playing a role that has a bigger future than the two options before me. In some ways the photo desk is the heart of this game. Assignments are built around taking photos, and this is the location built for reviewing, sorting, and sharing those photos. The photo desk allows users to scroll through photos by pressing arrows, placing them into picture frames and dropping photos into the Facebook share bucket or delete bucket. Both grabbing actions require making a grasping pose with a controller and releasing the grip at specific special points, which makes the action feel real.

The interface of the Antarctic assignment is minimal, perhaps even designed to be forgotten to enhance presence. Beginning the Antarctic assignment, the user is instructed to get in a kayak and take pictures. The interface includes a marker of where to go and sit

and highlights where to grab the kayak's paddles and the camera. After the kayaking portion is complete, the user must ice climb to their camp, and here there is no interface at all. There are no highlights to show users where to put the ice picks. Realism seems to be especially important in this section. After ice-climbing, there is the most interface out of the whole assignment. The user must pick up crates in the indicated way and move the crates into highlighted places. There are a lot of other highlight-directed actions in this assignment, but these are the only places where the interface is altered to complete tasks. Again, presence through realism seems to be prioritized in most parts of this assignment.

The interface and overall design of the Machu Picchu assignment is in stark contrast to the Antarctica assignment in both activities and the interface that enables those activities. In the Antarctic assignment, a correspondent talks to the user about where they are completing tasks to be safer through the night. At Machu Picchu, the correspondent actively discusses the simulation and has the user alter the simulation using location-specific interfaces. Acknowledgement and manipulation of the simulation is a theme that arose during my playthroughs that I will return to later in this chapter and in the next. These location-specific interfaces include area select buttons, which transport the user between four locations; sliders, which changed the scene's contents when the user traced the slider's outline; a yellow eye icon, which toggled digital overlays; yellow camera markers, which would restart completed sections; and a photo assignment device, which sits on the user's wrist like a watch and provides details about a current task. Examples are sliders and buttons are shown Figure 5.2 below.

Figure 5.2: Machu Picchu in *National Geographic: Explore VR*. Image A shows a slider and image B show a button.

The Machu Picchu assignment also included some items that do not cleanly fall into the category of object inventory or interface study. These items are a map, which is not actually interactive, but helps the user understand the overall place that functions as a part of the interface. The other, a corkboard of Hiram Bringham photos (Figure 5.3 below), is a central item in the assignment's storytelling. It cannot be engaged with like an object in this app, and it does not provide literal interface information. However, it does give the user visual information that is key to them understanding the story that they are playing. Situating photographic work, or nature-based work in general, in a lineage of other workers was another emergent theme in these apps that I will return to in more detail in this chapter and in the next. Like all questions of lineage and tracing, it is important to pay attention to who is included, who is excluded, and what effects these choices have.

Figure 5.3: Machu Picchu in *National Geographic: Explore VR*. Image A shows a map and corkboard. Image B show a close-up of the corkboard.

*Safari Central*

The interface of *Safari Central* is minimalistic compared to its successor, *Wildeverse*. The main menu screen consists of icons for the six animals. Selecting an animal loads the camera with other options on the side, including a back button, about button, like button, website button (which uses the text "Visit us!"), a shop button, help button, toggle camera button (that switches between rear and front facing cameras), and a camera button (that captures photos). A learn more button and support button are featured next to information about the animals when the user taps the about button, as seen in Figure 5.4 below. In the shop users can select different purchase options and request a refund.

Figure 5.4: Information about Beby in *Safari Central*

The interface options in this app reside at the corners and sides of the screen so that the user's view of the AR animals is unobstructed with overlays (other than the AR animal overlay, of course). Like *National Geographic: Explore VR*, this creates a more realistic experience. When the interface is pulled up, options support learning about the specific animals that are featured in the app, the species as a whole, and organizations that support them. Clicking the learn more button redirects users out of the app to a webpage from *Internet of Elephants*. This design means that once users want to break immersion, they can travel outside of the experience for information. This interface prioritizes realism and relegates interface buttons to the side. Tapping elsewhere on the screen either moves the animal or has no effect depending on whether the user has the front or rear-facing camera open.

*Wildeverse*

*Wildeverse* has three main tabs—chat, wildeverse, and journal—and each of these sections has distinct interfaces. In the chat tab, the user can scroll through recent messages, select a reply when it is available, collect journal notes, and accept missions.

Much of the conversations in the chat log take place between different NPCs, but the user will always have a chance to select a pre-scripted dialogue option at least once during the conversation between missions. Sometimes these are one word replies with no other options; sometimes there are several complete thoughts from which to choose. The other two tabs are more detailed. The journal tab consists of several subsections, which are described in Table 5.1 below.

**Table 5.1**

*Journal Subsections in The Journal Tab of Wildeverse and the Content they Include*

| Subsection | Contents |
|---|---|
| You | Profile pic, name, species, location, XP, Level name and progress bar) |
| Team | Names, images, roles, locations, and description of characters |
| Scan Log | Names, images, roles, locations, scan count, and description of objects |
| Fio - Bio | Mission, progress, image, location, map, name, species, sex, age, location |
| Fio - Notes | Notes sent from chat (facts about Fio, species, terms defined, and org info) |
| Buka - Bio | Mission, progress, image, location, map, name, species, sex, age, location |
| Buka - Notes | Notes sent from chat (facts about Buka, species, terms defined, and orgs) |
| Chilli - Bio | Mission, progress, image, location, map, name, species, sex, age, location |
| Chilli - Notes | Notes sent from chat (facts about Buka, species, terms defined, and orgs) |
| Aida - Bio | Mission, progress, image, location, map, name, species, sex, age, location |
| Aida - Notes | Notes sent from chat (facts about Buka, species, terms defined, and orgs) |
| Credits | The animals, developers, testers, researchers, partner orgs, funders |

In the wildeverse tab the user can select any unlocked animal and then begin their current mission. Launching the mission opens the wildeverse, which also has a detailed interface that is detailed in Table 5.2 below. The buttons in the wildeverse tab are mostly self-explanatory. However, some buttons only display after calibrating the AR (an action that requires physical movement that I will return to later). Others only display after completing the mission. The ones that consistently display during the AR simulation are

the camera button, back button, LiDAR, scan button (when an object is tapped), and

warning overlay (when too close to an animal). Thus, these interface designs limit what

users can photograph based on progression in the storyline and by proximity to the

animal in question.

**Table 5.2**

*Buttons and Overlays Inside the Wildeverse in the* Wildeverse *App*

| Buttons and Overlays | Description |
|---|---|
| Continue Button | Green, featuring text and a play icon in black |
| Accept Button (for terms) | Green, featuring text and a play icon in black |
| Accept Button (for mission) | Green, featuring text and a check icon in black |
| OK Button | Green, featuring text and a play icon in black |
| I'm Ready Button | Green, featuring text and a play icon in black |
| Ready Button | Green, featuring text and a play icon in black |
| Things to Scan | Current Mission Prompt, requirements, and start button |
| Walking Button | Silhouette of hiking boot |
| Camera Button | Silhouette of camera |
| Back Button | Backward play icon in black on orange button |
| LiDAR | Text and scanning rings |
| Scan Button | Green, featuring text and a play icon in black |
| Scanner | Cross hair scope |
| Keep Playing | Green, featuring text in black |
| Finish Now | Red, featuring text and a play icon in black |
| Warning | Static, red overlay, "WARNING Too close to animal", "!" icon |

*Wildeverse* is designed for indoor play, which can be a difficult task because

exploration is severely limited by physical space. In the wildeverse tab, the LiDAR

scanner shows how close the user is to the nearest object. To find the nearest object, the

user must walk in any direction and watch the scanner to see if they get nearer to or

farther from the object. This mechanic presents many problems for people as they move

(or can't move) around the real world for a wide variety of reasons. However, this app

accommodates indoor play or limited mobility via a walking button. For the first few

missions I attempted to use only actual walking to access the objects. It was very difficult

to complete missions because objects would be behind a wall or somewhere I could not

physically access. Afterwards, I tried using the walking button only to access these

difficult to reach items. This improved my ability to play the app tremendously, and I

eventually tried using the walking button exclusively. I found this to be the most

comfortable and natural way for me to play. I continued to use the walking button

through the remainder of my playthrough. This interface option made the app *much* more

accessible for anyone who doesn't have large spaces to safely roam, anyone who has a

disability that would prevent such movement, or anyone who simply doesn't have

roughly eight hours to wander around a large space.

It is worth noting here that I encountered several interface problems, glitches, and

usability issues during my playthrough. My phone's camera often crashed, freezing the

whole app. This was only a minor setback. However, at one point, I closed the app before

collecting the next mission, and when I opened the app again the prompt to collect the

next mission was gone and I could not replay the mission to open the prompt. There was

no way to get around this glitch. The only way to continue my playthrough was to clear

my app data and replay the app, making sure to carefully collect all missions and journal

entries before closing the app again. Additionally, the app never loaded the wildeverse at

the correct floor height. This did not affect my ability to play the app, but it did prevent

my immersion. The forest floor always loaded about a foot above my floor, no matter

how I calibrated the app. This made for strange effects, such as objects on the "ground"

appearing as if they were hovering in space. There were also many objects that needed to

be scanned in trees, which required pointing the camera upwards; however, the app was unable to track movement without having the floor in view. If I pointed the camera up and moved it around for more than a second or two, the camera would freeze, and I would have to point at the ground before it could "see" again. This made me play very awkwardly, waiting until I came as close as possible to the tree that I needed to look up before doing so.

**Object Inventories**

Object inventories catalogue all known objects that the user can interact with or collect in the app, shown in the screenshot on my excel notes below in Figure 5.5. This includes their various properties, such as effects, value, and ability to share or trade. The columns of the object inventories include object, with descriptive answers; effects, with descriptive answers; value, with descriptive answers; sharable, with yes/no answers; tradable, with yes/no answers; other details, with optional descriptive answers. I regard objects in these apps as touchable, affectable figures in the app. Buttons, sliders, and overlays I considered specialized forms of the app's interface, not objects. Objects sometimes compete with the camera for the user's attention. Other times, objects are repositioned for the camera. Objects, and the way(s) that users can (and are invited to) use them, are important for understanding the ways in which users take photographs and of which objects they take photographs.

| Object | Effects | Value | Sharable | Tradable? | Other Details |
|---|---|---|---|---|---|
| Camera | Takes photographs | N/A in app | No | N/A in this app | Screen reads "Please look through the viewfinder to take a photo" or shows most recently captured photo |
| Photogaphs | N/A | | Yes | | Only sharable on Facebook. Can also be displayed at base or deleted . Max of 300. |
| Cell phone | Unlockable function of co-op | | No | | Unlocks after missions are complete. Rings. |
| National Geographic Magaine Poster: Emporers of Ice | Collectable | | No | | Collected after completing the Antarctic Mission |
| National Geographic Magaine Poster: Machu Picchu | Collectable | | No | | Collected after completing the Antarctic Mission |
| Whale decoration | Collectable | | No | | Collected after completing the Antarctic Mission (no such reward for Pachu Picchu) |
| **Antarctic** | | | | | |
| Kayak | Enables travel over sea | | No | | |
| Kayak Paddles | Steers and speeds up kayak | | No | | |
| Pickaxes | Enables ice climbing | | No | | |
| Tent Rope | Necessary to proceed through app | | No | | |
| Zipper | Opens tent | | No | | |
| Kersene Lamp | Illuminates tent | | No | | Acts like touch lamp. |
| Sleeping Bag | Necessary to proceed through app | | No | | Not recognized without wearing goggles. |
| Crates | Necessary to proceed through app | | No | | |
| Goggles | Necessary to proceed through app | | No | | Must be wearing to recognize finding sleeping bag |
| Rope | N/A | | No | | |
| Personal Locator Beam | Can summon a helicopter at the end of the mission | | No | | Three parts to object. Helicopter comes without use. |

Figure 5.5: A screenshot of my *National Geographic: Explore VR* Object Inventory in Excel

Objects varied drastically in amount and use between apps; the variation is condensed into Figure 5.3 below. *Safari Central* has the fewest objects (6), which are *only* the animals of the app. The animals are *literally* objectified for the camera, which I address in more depth in the following chapter. *National Geographic: Explore VR* has a moderate number of objects (30), which were mostly survival gear, artifacts, and collectibles. These objects move the story along, and in some cases enhance haptic visuality, which I address in more detail in the Gameplay Logs section. These objects have very little to do with engaging the user about wilderness or wildlife and instead keep the user focused on their own safety or replicating historical civilizations. *Wildeverse* has the greatest number of objects by far at 97.[10] Objects include the food, waste, and tools of animals as well as and human's tools and waste. The interaction with these objects is acknowledged as a part of a simulation but still capable of providing biological data, such as stool analysis from animal waste. Other times these objects are acknowledged as being physically inaccessible because it is a simulation and not the physical object.

---

[10] There were some parts of these apps that did not fit cleanly into the Object category or any other category. In these instances, I address them in the app details below, but I do not count them in my total number of objects catalogued in Figure 5.1 Table of Objects.

**Table 5.3**

*Objects by Apps*

| App | Number of Touchable Objects | Description of Key Objects |
|---|---|---|
| **National Geographic: Explore VR** | 30 | Camera. Adventure gear and supplies. Hat. Simulated historical artifacts. Collectibles. |
| **Wildeverse** | 97 | Animals' food, waste, tools, beds. Litter. Objects to support scientific research. Objects to modify the natural environment for the benefit of wild animals. |
| **Safari Central** | 6 | Only the animals with which the user interacts. |

*National Geographic: Explore VR*

Photographs can potentially be the most numerous objects in this game. The

camera roll, which is stored in the app, can hold up to 300 images. I did not run out of

space to hold photographs during my playthrough, but I came very close. Each

photograph can be interacted with individually in the settings menu or at the photo desk

in the user's base. However, I count photographs as only one kind of object in my object

inventory. Unlike all of the other objects in this app, this kind of object can be recalled at

any time in the menu, varies in count, varies in quality, and has the ability to be shared or

deleted. All other objects in this game are static and only exist in certain locations for

certain purposes. The only other object that is similar to photographs in its consistency is

the camera, shown in Figure 5.6 below. The camera in this game is available to use at all

times except for a few short moments when scenes are changing, when the app is

explaining how to use a special feature, and during ice climbing. At all other times, the

camera is available to document your experience.

Figure 5.6: The camera object in National Geographic: Explore VR

The major differences between objects in these two locations is that in the Antarctic, objects are used for survival, and in Machu Picchu, objects are used for photographs. Most items in the Antarctic level are location-specific and task-oriented. Specifically, all but four items propel the user through the level or are used to complete a required task. These are practical objects: a kayak, kayak paddles, pickaxes, tent ropes, crates, a zipper, a kerosene lamp, a sleeping bag, goggles, and a personal locater beam. The other objects, extra rope, and three different kinds of supplies (sardines, a non-descript box, and a collection of cans) exist as things that you could find when looking for a specific item (goggles), so they still fulfill a role by providing a challenge. These survival items support the overall theme of surviving a dangerous expedition. This survival theme, and the objects that support it, affect the experience of taking photographs because high-stakes action events frame events for photography.

The items at Machu Picchu are similar in that all but one is required to complete a task. However, they are also quite different because, again, all but one of these objects do

not belong to the user. These objects are cultural artifacts that the user poses for the magazine shoot, including: a pot, a stove, a llama statue, a tumi (a ceremonial knife), a silver wawiki (a ceremonial statue), a gold wawiki, a plain stone wawiki, and three baskets filled with different food (maize, potatoes, and quinoa). The one object that does not affect the playthrough is a Machu Picchu hat that looks like a tourist ball cap. The user can grab the hat, place it on their head, and remove it whenever they want. When the user is wearing it, it partially obstructs the top line of vision as a ball cap would. Because Machu Picchu objects are primarily used for photographs, there is more emphasis on touch and surfaces of objects, but the objects at the Machu Picchu location are only cultural artifacts. These objects are occasionally discussed in context with wildlife or wilderness but are mostly discussed with regard to the ancient Inca. The limited ways in which these objects work to shape the user's understanding of wildlife and wilderness will be discussed in more depth in the next chapter.

In both assignments, the only objects that users can collect as achievements are two posters and a whale decoration. When the user completes the Antarctic assignment, a whale decoration appears on one of the walls at base. There is no such reward for completing the assignments at Machu Picchu. Since the Antarctic experience was released before the Machu Picchu experience, it's interesting that the creators chose to not give another wall art reward, though users do get a poster reward at the end of both assignments. These posters are enlarged magazine covers of the National Geographic issues for which the user was assigned to capture photographs. Notably, the magazine covers do not feature images that the user took during their photo assignments; they

feature photos of places that the user did not capture. The last unlockable object also includes a feature: a cell phone that enables voice co-operative play with another Oculus user.

*Safari Central*

The object inventory of *Safari Central* consists of just six items: the "real" animals within the app. These animals populate automatically in selfie mode and populate from a target for the rear-facing camera. The targets (which are physical objects) are either printed logos (of Safari Central and the conservation organizations affiliated with the app) or currency. The app appeals to international audiences, accommodating printed bills: 1 US Dollar, 5 Euros, 5 British Pounds, 1 Canadian Dollar, 1 Australian Dollar, 100 Indian Rupees, 10 Brazilian Reals, 100 Kenyan Shillings, 100 Hong Kong Dollars, 100000 Vietnamese Dong, 100 South African Rand, 1000 Indonesian Rupiahs, and 10 Swiss Francs.

The animals of *Safari Central* include a pangolin, an African elephant, a jaguar, a grizzly bear, black rhino, and a lemur. Despite these species having vastly different sizes, all animals populate in a diminutive form that can be placed on the hand. Ethyl the grizzly bear is shown on a $1 bill in Figure 5.7 below. The size and position can be adjusted by pinching the objects on the screen. Animals can be placed to seem larger by forcing perspective. Put another way, the user can make them seem like they are farther out (and thus larger) than they would appear placed next to the user, but it is difficult to do. These animals perform sensationalized interactions on a loop, such as roaring, swiping, and other dramatic movements. Though there is not much to report in this

section for *Safari Central,* this design choice is something that I will return to in the next chapter, tracing its choices in relation to other historical videogame design choices.



Figure 5.7: Bear from *Safari Central* on $1 Bill next to a 13lb dog

*Wildeverse*

*Wildeverse* contains far more objects than its predecessor *Safari Central*, and still more than *National Geographic: Explore VR*. These objects appear only in the wildeverse and almost exclusively on the (virtual) forest floor and canopy. A couple of objects rest near standing eye-level because they are mounted to a tree or are simply very tall, but most objects require the user to look down at the floor/ground or up at the ceiling/sky. Mission objectives throughout the app consist exclusively of moving through the wildeverse and scanning objects. There are a finite number of objects per mission, and each item can only be scanned once. Sometimes there are more objects than needed to complete a mission, and other times the user must scan all of the objects to progress through the app. Each scan rewards the user with points that are tallied when the mission is complete, and there are bonus points for completing the mission quickly. These points

raise the user's experience points (XP), and a minimum XP is required to unlock the missions for the other three primates. However, there is no way to complete the missions with so few points that the user does not progress to the next stage.

The objects that users scan consist mostly of plants and fruits native to the areas "scanned into the wildeverse," which are from the Nouabale-Ndoki National Park in the Republic of the Congo and parts of Borneo, Indonesia. These native plants and fruits are likely largely unknown to Western audiences, but the app takes time to describe some of them in the chat log. Some examples include bokoko, ponak, lunuk buhis, and pisang pisang besar. The app also offers a brief description of all objects (except the primates) in the scan log. The descriptions in the scan log are very short, consisting of a phrase or a short sentence. The entries also include an image of the object, its native region, size, and the number of times that the user has scanned it. The variety of flora and the contextualization of how people and animals use them provides rich detail, visualizing significant food sources for both primates and local populations.

Other objects that are frequently scanned are waste. In particular, the user scans primate stool, which is usually written in the chat as 💩. Users scan animal waste to collect information from the stool. Similarly, the user also collects urine samples. Some conversation between NPCs and the user is built around protecting the user from primate waste (such as wearing a hat). Between protecting the user's body and being able to collect information from waste samples, there is some tension regarding the nature of the wildeverse. In some cases, these objects are described as something the user cannot touch, and in other instances the user is able to collect information from and feel subject

Sindelar 165

to the materiality of animal waste. I'll return to this point of tension in the Gameplay Logs section below and in the next chapter.

Users also interact with human waste in the form of litter from local populations and other objects indicating a human presence. Some of this waste is accidental, such as when a researcher evades an elephant charge and loses his surgical mask, which is a common way to prevent transmitting airborne illnesses between researchers and the (other) primates they study. Other waste, intentional waste, is labeled as litter. Litter comes in a variety of forms, and NPCs in the chat log offer commentary on them. These signs of human traffic are explained with empathy and understanding for the difficult circumstances facing local people who live near these apes, which I will return to in Interaction Logs section. The scan log has simple commentary (Figure 5.8 below). Examples include "rubber boots - ideal for walking through peat-swamp forests," "used plastic food container - not to be left in forest," and "casual footwear, ideal for lounging around base camp." Other artifacts of human activity allude to more violent encounters, such as campfires from poachers and bullets from hunters. These objects are similarly situated with understanding for complex relationships and the circumstances that people inherit through no fault of their own. Again, the scan log offers succinct descriptions, including "evidence of the presence of hunters or poachers" and "[bullets] for a rifle or machine gun, evidence of the presence of hunters or poachers." The evidence of people seeking to hunt and kill trophy animals or bushmeat is juxtaposed to encountering evidence of animal habits, preferences, health, and intelligence.

Figure 5.8: Items in the Scan Log in *Wildeverse*

Evidence of animal habits and preferences comes from scanning items such as leaf handkerchiefs and nests. From these objects the user learns about certain apes' habits over time, such as how an ape can move between groups and rise or fall in social hierarchy. However, this insight isn't offered from actually interacting with these objects; it comes from the chat log after the user has collected "data" from the objects. This is another point I will return to below as it pertains to the interaction log and touch in the gameplay log. Other evidence appears in tools crafted by (other) apes, such as a termite fishing stick or a club stick. These tools of (other) apes appear next to the man-made

tools used to study and benefit the environment of these apes. These tools include an air quality meter, butterfly trap, water level meter, weather station, and a tablet. There are also some quality-of-life tools, such as head net (for keeping sweat bees away) and a sardine can fence (for warning about curious elephants). Similarly, there are quality of life tools for wildlife, including manufacturing webbing that helps orangutans cross newly created rivers and artificial horn bill nests. Presenting waste and tools next to each other highlights similarities between humans and other animals. This quality culminates in an explicit challenge to human exceptionalism in the chat log, which I address in the Interaction Log section.

**Interaction Logs**

My interaction logs catalogue interactions, including dialogue, using a camera, and other interactive experiences, shown screenshot Figure 5.9 below. The columns in the interaction logs include touch type, with descriptive answers (an entry "N/A" notes where touch did not occur); camera use, with yes/no answers; interaction, with descriptive answers; details, with descriptive answers; other notes, with optional descriptive answers. Touch-based interactions include photography and camera actions, but interactions beyond the camera still direct the user's attention in important ways that affect their understanding of the world and what they are taking pictures of. Similarly, dialogue presents important information for understanding what users are photographing and why they may be doing so.

| Touch Type | Camera Use | Interaction | Details | Other Notes |
|---|---|---|---|---|
| Base - Tutorial | | | | |
| N/A | No | Voiceover/Caption | N: "Hi I'm Natalie, your National Geographic Editor" | |
| N/A | No | Voiceover/Caption | N: "Today you're headed out on an expedition and we'd like you to send us photographs of your journey." | |
| N/A | No | Voiceover/Caption | N: "But first, let me show you how to move around." | |
| N/A | No | Voiceover/Caption | N: "Look at your left hand to see controls." | |
| N/A | No | Voiceover/Caption | N: Push the left joystick with your thumb, then aim your controller at where you want to go." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | |
| N/A | No | Voiceover/Caption | N: "When you're ready, release the joystick." | |
| N/A | No | Voiceover/Caption | N: "Take your time to explore the base and move when you're ready." | |
| Press Left Joystick | No | Move | Repeated many times to navigate through base. | |
| Press Left Joystick | No | Move, Voiceover/Caption | N: "Great. As a National Geographic explorer your photos have the potential to make people curious about the world we share. So, lets take your first National Geographic photo!" | |
| N/A | No | Voiceover/Caption | N: " To start, look down and pick up the camera using the highlighted button." | |
| Right Grasping Button | Yes | Pick up Camera | Hand must be aligned with virtual camera located on right side by belt area. | |
| N/A | Yes | Voiceover/Caption | N: "Take a peek through the viewfinder" | |
| Right Grasping Button | Yes | Looking through view finder | Must hold camera to face | |
| N/A | Yes | Voiceover/Caption | N: "Awesome. You can zoom in or out by rotating the lens." | |
| N/A | Yes | Voiceover/Caption | N: "Take a look through the viewfinder on the camera." | I dropped the camera. |

Figure 5.9: A screenshot of my *National Geographic: Explore VR* Interaction Log in Excel

Both *National Geographic: Explore VR* and *Wildeverse* presented narrative and many specific, necessary touch actions. *Safari Central* stands out from these two apps because it provides *no* narration and no specific, required touch actions. Of course, the user must touch places in the app to select options and interact with the interface, but there are no specific touch actions that the user *needs* to perform to progress through the app. Since there is no narrative and no sequence to follow, it is not even accurate to say that users *progress* through the app. It is more accurate to say that users access varying percentages of content, and all content is non-linear. *Safari Central* relies on the user's inherent interest to explore the app for additional information rather than requiring the user to access specific information before progressing to new content. Notably, *Internet of Elephants* switched to a progression game-based design for *Wildeverse* after making *Safari Central*. The degree to which necessary touch and narrative guide the experience of photography is something that I address in this section and expand upon in the next chapter.

*National Geographic: Explore VR*

There are three narrators throughout *National Geographic: Explore VR*, and these narrators guide the user's exploration and interactions to varying degrees. The first

narrator, Natalie, appears (through voice only) in the basecamp to give tutorials. In the

Antarctic assignment the user actually sees a short glimpse of the new narrator, Mike, at a

distance (Figure 5.10 below). Mike communicates via headset and acts somewhat like an

omnipotent narrator by knowing about things the user sees without any mention of a

camera. The third narrator is Jose, who is introduced as the local guide at Machu Picchu.

Natalie and Jose engage in dialogue with each other and give the user instructions based

on their discussions. The user has the experience of overhearing conversation and being

affected by it, but they cannot contribute to the discussion. Similarly, in the Antarctic, the

user cannot reply to Mike.



Figure 5.10: Mike on a ship in the Antarctic in *National Geographic: Explore VR*

Mike's narration provides some instruction, like letting the user know how to

navigate or complete tasks. Mike also dramatizes experiences by drawing attention to the

user's safety and has 14 lines on this topic. Examples include, "Okay, take it easy now, you're quite safe; the Orca is just checking out your kayak." and "There doesn't seem to be a sleeping bag here… without one you will get hypothermia." When the user almost falls while ice climbing, he says "WOW! That was too close!" His commentary sets the stage for how the user should feel, saying "After ten days cooped up aboard you must be keen to get going and to make the most of your time here on the Antarctic Peninsula." He also explains why the user is in the environment and the purpose of their photography. He tells the user: "The colony of Emperor penguins we've been studying seems to have moved, and you're here to find it." He instructs the user to "Take a photo to document your discovery!" and reminds them again by saying "Don't forget to document your journey! Your photos will be a valuable addition to our research." The rest of his narrative is focused on educating the user about the wildlife and wilderness through short facts that correspond to whatever animal is in front of the user. For example, when the user comes upon a minke whale, Mike says "Minke whales are much smaller than most other whales. Adults only reach about twenty-five feet long." This dialogue comprises the educational portion of this experience. Through this dialogue Mikes sets up exigency for taking photographs, creates urgency to frame situations, and rewards the user's playthrough with animal facts.

The interaction logs between Antarctica and Machu Picchu look very different, reflecting the different design choices for these two locations. The Antarctic level allows for more of a free style play; though the entire experience has a definite beginning and ending, there are choices between those points. The kayaking part of the assignment is

entirely propelled by the Antarctic currents, following a rail-style game design, though the user can go "off the rails" by paddling more to the right or left. Speed can also be increased by paddling forward; however, the current (or rails) will only allow for so much deviation. Users follow the path, cannot stop completely, and can only increase speed to a small degree. This design gives user some agency while ensuring that they interact with everything that the designers intend. That agency can bring them closer to seals, penguins, birds, and icebergs. Users can't take photos while paddling, but paddling can get them in a position where they want to take a photograph.

After kayaking, the user must ice climb to their camp. There are two paths up the icesheet, one much more difficult than the other. I chose the more difficult path because I was curious about how difficult this game could be and how it would reward its users after completing difficult challenges. The basic interaction was the same: swinging icepicks (using both arms with the controllers) into an ice wall. This more difficult version required crossing gaps, going around curved ice, navigating around ice that was too thin, and traveling downward before climbing back upwards. However, this app isn't a game. There is no score and no way to fail. The app does not let the user release more than one icepick at a time (which would result in falling) or get stuck anywhere. The app, does, however, reward the more difficult choice by providing several different experiences that evoked such haptic visuality that I address them in my Gameplay Log (whirling wind and a snowmobile stuck in a crevasse). These experiences also present extra opportunities for photography.

After ascending the icesheet, the interaction at the camp is centered around preparing to survive the storm overnight. The user finds the tent unsecured, crates blown down, and the sleeping bag missing from the tent. To progress through this stage, the user reconnects the tent's ropes, stacks crates to block the wind, and finds a set of goggles and a sleeping bag for the night. There are some other smaller interactions—including zipping and unzipping the tent, placing goggles on your face, and turning a kerosene lamp on and off—that users must complete to survive the night. Again, this isn't a game, so failure isn't an option. After the user completes all of the tasks, the experience fades to black and then fades back in again, signaling that the storm has passed and it's the next day.

Emerging from the tent, the user is prompted to explore. Admittedly, there is only one path cut into the glacial ice, and it leads to the penguin colony. At this point, the only task left is taking pictures of the colony. After a short amount of time taking photographs of the colony, Mike radios to tell the user to find the locater beam so that the helicopter can pick them up. I decided to wait to complete this task because I wanted to continue taking pictures of the penguin colony. However, after repeating the instruction twice, the helicopter arrived, and the Antarctic adventure ended. Again, the game provides some leeway for self-direction in photography and interaction, but ultimately followed its own pacing and design.

The interaction at Machu Picchu was much more guided, both by the narrators' dialogue and the interface. Natalie and Jose discuss different ideas for the magazine, eventually deciding on suggestions for the user to complete. They also discuss the site,

which includes education about Bingham's photos and the ancient Inca but not about the wildlife or wilderness. The only times wilderness and wildlife are addressed are to explain that site is subject to frequent earthquakes, that different constellations of stars were visible on the Southern hemisphere, and to provide a quick fact about lizards in the area. There was some cultural information that intersected with the areas: the narrators explain that the Inca and descendants of other indigenous groups tell stories about "dark constellations" (the dark space between stars), which include depictions of a mother and child llama. Living llamas appear at Machu Picchu, but they remain behind an invisible barrier and the user cannot interact with them except for taking photos at a distance. Additionally, the only photo tasks that include animals are optional: the user can capture a lizard sunbathing on a rock and a condor flying over the Temple of the Condor.

In general, the Machu Picchu assignment within *National Geographic: Explore VR* was less concerned with facilitating care for wildlife and wilderness than in the Antarctic assignment. In this assignment, wilderness needs to be *managed* for photographs. At one point Natalie says, "Epic shot. See how the jungle is creeping up on the terraces? We can fix that! Our digital team prepared an overlay to highlight the trail. Trace the trail to show us where it goes, and it will appear." Rather than engaging with the world as it is, the required photo assignments are built around replicating the past, either by mimicking Bingham's photo or recreating Inca living through simulation. The interface at Machu Picchu engages the user by having them touch the simulation as a simulation. The interface features mechanics for controlling the environment, which includes toggle buttons, sliders, a watch, and models to pose in VR space. As I will

Sindelar 174

discuss more in the next chapter, the more control that the app gives to the user, the less the app asks the user to notice (or care about) the world around them as it is. This directly affects the experiences of photography because the world is something to be managed before capturing photographs.

*Safari Central*

Safari Central does not feature *any* narration or specific, required touch actions. My raw notes for this section include one line "N/A to this app." However, I would like to expand on what is available in *Safari Central* that the app does not *require* users to do. To use the app at all, you do have to do *something*, so I recorded the touch interactions I chose to perform as I went through the app. Completing simple, necessary actions to load the animals presented some challenge. I do not typically carry cash, nor do I have a printer stocked with ink. I was relieved to find a dollar bill in my car for this playthrough, but this may present an obstacle that prevents play for many users.

Other touch interactions include tapping the screen to direct an animal to maneuver to the location and pinching the animals to change their size. When tapping the screen to move the animals, the user must wait on the animals to slowly walk through the space. The one exception to this is Beby the lemur who hops through space (Figure 5.11 below). I completed Beby's part of the playthrough last, so I was especially surprised when she hopped to different locations. I found this new type of response to my touch exciting and more engaging. Varying responses affected my personal experience of this game.

Figure 5.11: Beby fitting on top of cinnamon buns in *Safari Central*

*Wildeverse*

There are many entries in my interaction log for specific, required touch in

*Wildeverse*; however, these interactions are largely repetitive. The full sequence for

loading the wildeverse is outlined in Table 5.4 below. These actions include tapping five

buttons, gently swinging the phone over the floor (to calibrate the AR simulation), and

finally waiting for a loading screen to disappear. This is followed by an equally repetitive

action that includes moving either by steps or the walking button, tapping an object once

to select, and tapping it again to scan. Once all items are scanned, the user taps the

continue button twice, once to proceed past the score, and once again to exit the

wildeverse. If there are more objects to scan, the user can choose to go back for a higher

score. Once the user leaves the wildeverse, they are taken back to the chat log. After

going through the chat sequence, the user is given another mission and repeats these

interactions for the wildeverse. This pattern is occasionally broken up by journal entries

and external links from the chat.

**Table 5.4**

Wildeverse *Notes Excerpt – Interactions for Loading the Wildeverse*

| Touch Type | Camera Use | Interaction Type | Details |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildeverse Tab | |
| Tap | No | Enter Wildeverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildeverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |

Though there are many objects to scan in the wildeverse, interaction with

objects—with one exception—are always the same: tap to select and tap to scan. I don't

want to trivialize the decision to include so many varieties of plants, fruits, and other

objects. Designers of this app prioritized biodiversity. These surfaces matter, but this

variety does not extend to interactions with these objects. The one exception is that when

a user gets too close to an animal, they are given a warning screen and cannot select or

scan anything. This warning screen only appears for apes that move on the ground (Buka

the gorilla and Aida the chimpanzee). The other apes swing from trees and stay a safe

vertical distance from users. This rigid construction of interaction presents few in-game

directives and pre-planned exigencies to capture photographs. In other words, there are

no framing events like there are in *National Geographic: Explore VR*.

There is much more variety in the chat log, and I have chosen excerpts of

interaction log as examples. I refer to the narrators in shorthand in these excerpts: A for

Amyra, the creator of the wildeverse; E for Eka, a researcher in Borneo; Es for Espoir, a

researcher in the Republic of the Congo; and J for Johannes, a field coordinator for a zoo in the UK. Jodi, the curator of primates for the Atlanta Zoo, is the final member of the "team," but she does not appear in my excerpts here. All team members are modeled on actual people in these roles who are acknowledged in the credits section of this app. The topics that emerged from the chat log were photography, the importance of research, the user's role in conservation efforts, ethical consideration of zoos, awareness of large-scale and local environmental concerns, the (sometimes precarious) relationships that local people have with wildlife and wilderness, and the commonality between humans and other apes. Again, these chat logs develop the world (the wildeverse) in which users take photographs, and that construction is important to understanding how photography functions in the app.

Photography is addressed early in the chat when one of the team members asks if the user has been taking photographs inside the wildeverse, shown in Table 5.5. In this scenario I had multiple dialogue options. When there were multiple options to choose from in the chat log, I tried to choose the option that I would choose during an unobserved playthrough. For me, that meant choosing the most entertaining option. Sometimes that was my honest answer; sometimes it was not. In this case, I responded honestly with "Yes." The dialogue that follows my answer explains that photography is useful for garnering research funds, which another team member acknowledges as a possibly cynical motivation. Photography in this game is in part situated as a money-making tool. Using the camera to gather information, however, is discussed with much more reverence.

**Table 5.5**

Wildeverse *notes excerpt – Amyra (A) and Eka (E) Discuss Photography*

| Interaction Type | Details |
|---|---|
| Dialogue | A: "I've still got a photo of that pinned to our notice board" |
| Dialogue | A: "Have you been taking any photos inside Wildeverse?" |
| Dialogue Button(s) | "No" ; "Not yet…" ; "Yes" |
| Choose Dialogue | "Yes" |
| Dialogue | A: "We take loads out in the wild all the time" |
| Dialogue | E: "good for raising money for our work out here [money bag emoji and shhh emoji]" |
| Dialogue | A: "Borderline cynical but that is why we love you, Eka" |

Dialogue throughout the app explains the importance of the "work" that the user is doing with the researchers, how it is making a difference, and how it is supporting these apes. Caring for the animals is situated in learning about them (and the problems that they face) and studying them. To study them, the user must scan objects. In other words, to perform caring actions, the user must touch objects and point a camera at them. In the app, users learn what the scan reveals in the chat log and have the opportunity to read more information in journal entries, as Table 5.6 shows. The narrators are very encouraging, expressing the user's proficiency with collecting data and helping.

Table 5.6:

Wildeverse Notes Excerpt – Eka (E) Encourages Conservation Work

| Interaction Type | Details |
|---|---|
| Dialogue | E: "we know this because we follow them from the moment they wake until their bedtime. every day [sweating smile emoji]" |
| Dialogue Button(s) | "Doesn't Fio mind you being in her space all the time?" ; "Seems like a lot of work!" ; "I wish I could spend my entire day following wild animals" |
| Choose Dialogue | "I wish I could spend my entire day following wild animals" |
| Dialogue | E: "follow your dreams, kailan I did and now look I'm literally in a swamp" |
| Dialogue | E: "it is hard work, but it's really the best way to study and protect them" |
| Dialogue | E: "you know Fio's mum Feb was one of the first we studied here. Took her quite a while to get used to us! |
| Dialogue | E: "and until she did, she was throwing fruit at us all the time |
| Dialogue | E: "we call it habituation' here's a note about it: |
| Collect Button | Journal Entry |

The app touches on uncomfortable topics as well. One of these topics is wildfires, which the app acknowledges as something that may hit close to home for some users. The topic comes up in relation to the peat forest of Borneo, which is extremely flammable after recently built rivers have drained the swamps. Eka says, "hey sorry kailan - fires are a bit of a heavy topic [line break] do you feel alright about me talking about these kinds of threats?" After addressing the user's comfort level, the app links users to a website that gives real-time air quality data for the user's (actual) location, which can be seen in Table 5.7 below. This design creates a link between the user's day-to-day life and the day-to-day life of gibbons in Borneo. Eka even explains that the gibbons' experiences can be measured in stool samples (much like the stress the user just gauged about themselves). Eka elaborates on the difficulties associated with air quality, explaining, "smoke stops

gibbons from singing…[line break] they simply can't get enough air to sing in this haze."

However, this thick haze is never shown in the wildeverse; it can only be observed

through scientific observation (not observing gibbons). This means it can also never be

observed in photography.

**Table 5.7**

Wildeverse *Notes Excerpt – Eka (E) Discusses Air Quality*

| Interaction Type | Details |
|---|---|
| Dialogue | E: "see - we think there's a link between the amount of smoke in the air…" |
| Dialogue | E: "and cortisol levels in gibbon [poop emoji]" |
| Dialogue | E: "(when there's smoke, the gibbons are stressed, in other words" |
| Dialogue | E: "how's the air where you live |
| Dialogue Button(s) | "It's great. Fresh air every day!" ; "It's not good. So much pollution..." ; "I never think about it. I just breathe it" |
| Choose Dialogue Button | "It's great. Fresh air every day!" |
| Dialogue | E: "you're super lucky" |
| Dialogue | E: "it's something we can easily take for granted" |
| Dialogue | E: "very cool that you appreciate what you have" |
| Dialogue | E: "check out this site - real time air quality readings from all over the world https://waqi.info" |
| Dialogue | E: "anyway - this data you've found has given us enough data for out grant application…" |

Interactions between local populations and wilderness come up frequently. Not

all problems are obvious, such as the emerging effects of new logging roads in the

Republic of the Congo. Rather that describing all of the problems, Espoir explains that

"the logging roads give people easy access deep into the forest to hunt for bushmeat.

Sometimes right up to the park." Despite disliking what he sees, his stance stays

sympathetic, and he acknowledges the invaluable help that local populations provide. He

says, "People have always lived right here. I know that [line break] lots of them work with us [line break] the best trackers and botanists on the team [line break] and frankly their voice is important when we talk to the government." At another point Espoir applauds the skill of local people, saying, "Most of our trackers are Bayaka people. From the region. [line break] They've traditionally lived by hunting & gathering. [line break] They can get you to a gorilla quicker than a nature documentary." This respect and practicality are coupled with inviting the user to discover the negative effects of new logging roads for themselves, as shown in Table 5.8 below. In this way, the app does leverage touch, visualization, and exploration of its AR simulation.

**Table 5.8**

Wildeverse *Notes Excerpt – Eka (E) and Espoir (Es) Discuss Logging*

| Interaction Type | Details |
|---|---|
| Dialogue | Es: "What do you think is the biggest effect of logging here in the Congo?" |
| Dialogue Button(s) | "Deforestation and loss of habitats?" ; "Loggers - people - poachers?" ; "Loss of special trees that animals depend on? |
| Choose Dialogue | "Deforestation and loss of habitats?" |
| Dialogue | Es: "We're lucky so far that this hasn't happened here, though it is happening in other parts of the African rainforest." |
| Dialogue | Es: "OK, how much time do you have?" |
| Dialogue | Es: "(that was a rhetorical question)" |
| Dialogue | Es: "They don't chop down everything, like in Latin America or Asia." |
| Dialogue | Es: "They select specific trees for, for export." |
| Dialogue | Es: "But we don't know that long term impacts, since the trees take so long to grow back." |
| Dialogue | Es: "So… still a big risk, and that's why our research is so important." |
| Dialogue | Es: "But the loggers make roads." |
| Dialogue | Es: "And then trouble drives in and out on those roads." |
| Dialogue Button(s) | "What kind of trouble?" |
| Choose Dialogue | "What kind of trouble?" |
| Dialogue | Es: "Ah, kailan. Rather than explain, you should see for yourself." |

Another difficult topic that the wildeverse app addresses is poaching. Again, through narrators working in the field, the app takes a sympathetic and understanding stance. At one point the user encounters bullets in the wildeverse. Poachers are situated as people with few options and few resources, shown in Table 5.9 below. The user is also asked what their opinion is on poaching. In this situation I chose the least extreme answer to see what the app would say without having a strong opinion to counter. In addition to the plight of the hunted animals and the poachers with few options, the precarious position of researchers is highlighted. Despite how they feel about these situations, they need to remain neutral for their own safety. The app does not imply that the user's safety is at risk. While this may seem obvious because the wildeverse is only an AR simulation, the app flouts this reality in other instances.

Table 5.9

Wildeverse Notes Excerpt – Eka (E) and Espoir (Es) Discuss Poaching

| Interaction Type | Details |
| --- | --- |
| Dialogue | Es: "Those are poacher's bullets." |
| Dialogue | Es: "They're not here for Buka though - do not worry." |
| Dialogue | Es: "The poachers come for the ivory from elephants." |
| Dialogue | Es: "And it's now easy for them, to get it out because of the new logging roads." |
| Dialogue Button(s) | "There are men with guns in this national park?" |
| Choose Dialogue | "There are men with guns in this national park?" |
| Dialogue | Es: "Oui." |
| Dialogue | Es: "Machine guns aren't hard to find in former conflict zones." |
| Dialogue | Es: "People are poop. Guns are cheap. Ivory is valuable." |
| Dialogue | Es: "If we see poachers, we turn around." |
| Dialogue | Es: "I mean… I have never held a gun in my life. We let them be." |
| Dialogue | Ek: "hey" |
| Dialogue | Ek: "I know this feeling" |
| Dialogue | Ek: "it's a bad feeling [cry face emoji]" |
| Dialogue | Es: "kailan if a poacher is caught, what do you think should happen to them?" |
| Dialogue Button(s) | "Lock them up for life" ; "Punish them, but don't ruin their lives" ; "Let them, go… they're just trying to survive" |
| Choose Dialogue | Punish them, but don't ruin their lives |
| Dialogue | Es: "You know it's a tough situation, and everyone has a different opinion." |
| Dialogue | Es: "I know some poachers. They are really poor with few other options to feed their families." |
| Dialogue | Es: "I do believe we need to punish illegal activity…" |
| Dialogue | Es: "But the blame really lies with the people behind buying ivory, and the cartels that run the market." |
| Dialogue | Es: "That's who we really need to go after." |
| Dialogue | Es: "Right now, when we find a poacher we just carry on & do our jobs & report everything we find, so the eco-guards can do their job." |

The logic of what the wildeverse does and does not count as a simulation is

unclear from the dialogue. Despite only being a simulation created from scans, the user's

job is to… scan objects. Additionally, these scanned objects that the user is scanning again can offer material information, such as DNA analysis and hormone testing. At one point, Amyra says, "Hey, check it out. The hairs that kailan just found aren't from Buka's family [line break] The Wildeverse DNA database says it belongs to a silverback called Kingo [gorilla emoji]" This isn't a one-off occurrence, as shown in Table 5.10 below. One of the main storylines comes from collecting many waste samples from the orangutan named Fio, which culminates in discovering that (the assumed female) Fio is a male. The chat log frequently discusses animal waste, lauding the ability to study animals through it and acknowledging the undesirability of the material. This dialogue and design calls into questions what does and does not count as a simulation (similar to *National Geographic: Explore VR*).

**Table 5.10**

*Wildeverse Notes Excerpt – Amyra (A) and Eka (E) and Espoir (Es) discuss DNA*

*Samples*

| Interaction Type | Details |
|---|---|
| Dialogue | A: "Guys - there's something weird about the DNA from that pee sample" |
| Dialogue | A: "don't know if it's just Wildeverse playing up or what" |
| Dialogue | A: "can we get some, um… 'special samples' to cross-check? [wink emoji]" |
| Dialogue | E: "[cry laugh emoji] Sure!" |
| Dialogue | E: "kailan… I've got a [hug emoji] REALLY GOOD MISSION [hug emoji] for you [laugh cry emoji]" |
| Dialogue | E: "..." |
| Dialogue | E: "we need some orangutan poo [poop emoji] some urine samples [umbrella emoji] - and lots of it" |
| Dialogue | E: "to work out what's up with all the weird DNA data Amyra's seeing..." |
| Dialogue | E: "are you up for collecting?" |
| Dialogue Button(s) | "Um. I'm not massive on ape [poop emoji]. Convince me" ; "Yes. I have always wanted to hunt ape [poop emoji] in a forest" ; "No. I refuse the task of collecting ape [poop emoji]" |
| Choose Dialogue | "Um. I'm not massive on ape [poop emoji]. Convince me" |
| Dialogue | E: "dung is great. all I can say is trust me. Two samples of each should be more than enough" |
| Dialogue | E: "I'll also get into the jungle here to find some samples myself, just to double check it's all working properly" |

The app closes with dialogue addressing the commonalities between users and other apes, shown in Table 5.11 below, and it is one of the central messages of *Wildeverse*. Sometimes it is addressed by explaining the tools that protect against the transfer of disease between researchers and apes. On this subject, Espoir says, "They don't want what we've got and we don't want they've got. [line break] Gorillas are really susceptible to human respiratory illnesses. […] We've found ebola in gorilla populations outside Ndoki." From the beginning of the app, ape tool use for improved quality of life

is a topic of discussion. For example, orangutans make leaf handkerchiefs and use them in similar ways as us. Eka says, "we've seen orangutans wipe their faces with leaves... [line break] "maybe to clean their eyes and noses, or to cool down? [line break] they use a lot of tools, just like us." By the time that Amyra says, "all this tool use, talking, family, and obsession with status kind of making me question the uniqueness of human beings" at the end of the app, the user has interacted with dialogue and objects that make this line more meaningful. Acknowledging the commonalities between humans and other apes, the app again prompts users to do "SOMETHING" to support these animals. Despite being a central theme, it is almost exclusively expressed through dialogue rather than through visual and photographic interaction.

**Table 5.11**

*Wildeverse Notes Excerpt – Espoir (Es) and Amyra (A) Question the Uniqueness of*

*Humans*

| Interaction Type | Details |
|---|---|
| Dialogue | Es: "If you could hear chimps in a fruiting tree, they're literally cheering." |
| Dialogue | Es: "In fact I've counted more than 30 different vocalisations." |
| Dialogue | Es: "Happiness. Danger. Anger. Delight." |
| Dialogue | Es: "They can 'chew your ear off'. Smile emoji." |
| Dialogue | A: "I don't want to get all serious, but..." |
| Dialogue | A: "all this tool use, talking, family, and obsession with status kind of making me question the uniqueness of human beings" |
| Dialogue | Es: "Um… wow. Er, Yeah Amyra. Raised fist emoji." |
| Dialogue | Es: "Yeah. This place puts things into perspective." |
| Dialogue | Es: "All lifeforms are wonderful in their own ways, and everything is linked." |
| Dialogue | Es: "You really want to tell the world. You really want to take action." |
| Dialogue | Es: "Working here, just watching it and leaning, makes me feel like I'm doing that." |
| Dialogue | Es: "The thing about doing something is that it's SOMETHING." |

**Gameplay Logs**

My gameplay logs catalogue of instances where touch, haptic visuality, and

camera use were a part of the gameplay, shown in the screenshot of my notes in Figure

5.12 below. Specifically, my columns include camera/photos, with yes/no answers;

physical touch type, with descriptive answers; haptic visuality, with yes/no answers and

more details if yes; details, with descriptive answers; other, with optional descriptions of

other details. The camera and touch were straightforward to catalog, but haptic visuality

requires extra awareness. Haptic visuality is a subjective experience but attempts to

create it can also be observed in the design of the game, such as realistically combining

motion with visual feedback. I do not think it is productive to delineate these experience as *either* subjective or prescriptive. My methods include marking this fraught place in between.
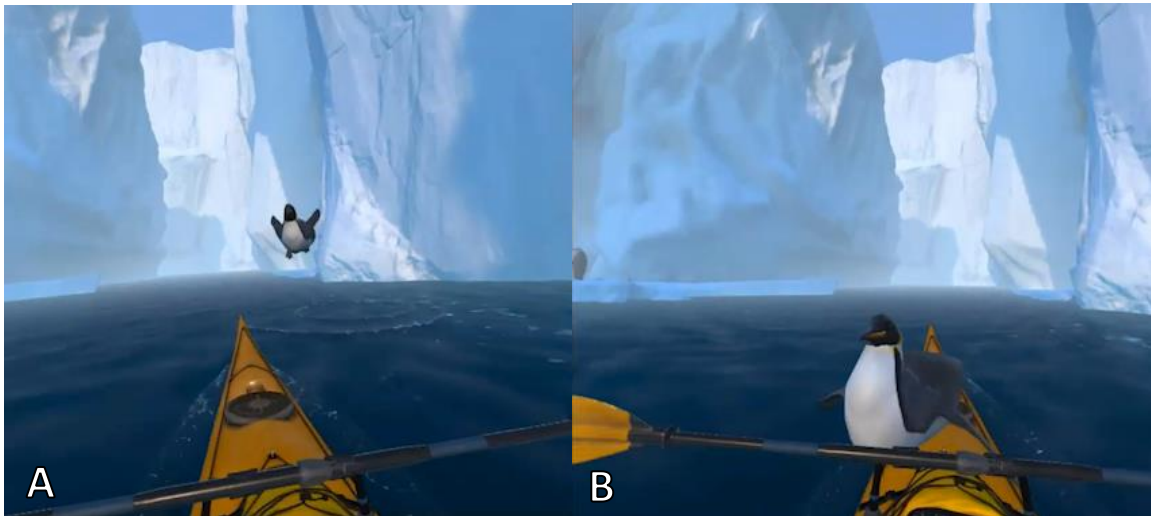
| Camera / Photos | Physical Touch Type | Haptic Visuality | Details | Other |
|---|---|---|---|---|
| No | N/A | No - Did not respond to touch | Voiceover Guide at Base | |
| No | N/A | No - Did not respond to touch | Voiceover Guide at Machu Piccu | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Walkthough | No - Did not respond to touch | Blacks out world | |
| No | Right Grasping Button | No - Did not respond to touch | N/A | |
| No | Walkthough | No - Did not respond to touch | Blacks out world | |
| No | Pick up phone | Yes - Seeing virtual hand/feeling controller | Hold object but no display on phone's screeen (unlocks later) | |
| No | Place phone on table | Yes - Seeing virtual hand/feeling controller | Felt natural to place phone on table (not drop anywhere) | |
| Yes | Press Right Grasping + Trigger Button | Yes - Engaged with area | Appreciated symetry | |
| No | Right Grasping Button | Yes - Seeing virtual hand/feeling controller | Did not respond to touch. Featured image of uncompleted mission (Machu Picchu) | |
| No | Move hand | Yes - Seeing virtual hand/feeling controller | Selected Antarcitica Activity | |
| No | Move hand | Yes - Seeing virtual hand/feeling controller | Started Antarcitica Activity | |

Figure 5.12: A screenshot of my *National Geographic: Explore VR* Gameplay Log in Excel

*National Geographic: Explore VR* and *Safari Central* both have strong immersion and haptic visuality for me. *National Geographic: Explore VR* is especially designed around haptic visuality because it incorporates motions that replicated real life actions and creates action events. *Safari Central* achieved haptic visuality by prompting users to pose animals in ways where the simulations touch other surfaces. I experienced very little haptic visuality in *Wildeverse* despite the app incorporating the most objects and opportunities for touch. These touch opportunities rarely aligned with my real world, which undermined my ability to feel immersion. These experiences present opportunities for further research in how the alignment of touch and the real world need to be designed with an awareness for each other. For this dissertation these notes show how touch and haptic visuality are used to engage the user, and how they do not align with efforts to facilitate care for wildlife and wilderness.

*National Geographic: Explore VR*

        The Antarctic assignment section of my gameplay log consists of regularly alternating instances of touch and camera use that reflect moving through the space and spontaneously taking photographs as I felt compelled to do so. Some photographs were of icebergs, but most were of animals. These animals included seals, orcas, penguins, minke whales, and (the far less elusive) seagulls. These animals are almost always at a distance during these photo ops. The orcas are close enough for Mike to assure you of your safety, but not close enough to touch. The seals and minke whales are seen from a far distance or height. Most penguins are only seen from distances or on heights (lower and higher) that the user cannot reach. Seagulls come close to the user, but not close enough to touch. The only animal that is close enough for the user to touch is a penguin that is used for a jump scare. This penguin jumps in and out of the water several times and timing a photograph of this penguin is very difficult. At one point the penguin changes direction and jumps right onto the kayak and (presumably) touches the user (Figure 5.13 below). It's notable that the only touch that can happen between users and animals in this mission is initiated by the animal and is used as a scare-tactic.

Figures 5.13: A penguin jumping into the user's kayak in the Antarctic in *National Geographic: Explore VR*. Image A shows the penguin leaping out of the water. Image B shows the penguin hitting the kayak.

Other instances of touch were with tools, including survival gear and transportation. These touch interactions created strong haptic visuality for me because the motion of paddling on a kayak felt real and the motion of moving ice picks to ice climb felt like what I imagine it would. There were other points of discovery that made the haptic visuality stronger. While ice climbing there were two kinds of material that the pickaxes could not stick into (snow and brittle ice). Discovering that my motion did not work with certain visuals made me engage with visuality in combination with motion. Surfaces took on more physicality. Haptic visuality is supported by motion in using these tools as well as with the camera. As I described in the Object Inventories section above, changing the photograph's orientation can only be changed by rotating the user's wrist, as with an actual camera, DSLR or otherwise. Motion is the primary mode of haptic visuality in this app.

There were two other points in Antarctica where visuality felt particularly haptic (or multisensory), both shown in Figure 5.14 below. These moments were during the ice-climbing section, and both were at least partially fear-based. At one point during the adventure the user goes between several ice walls. At this point the walls surround the user, creating the illusion of being trapped. The user must also move downwards, prompting them to see their extreme height. At this point there is also loud wind. With all of this combined, I felt more aware of the danger but also of how beautiful this (artificial) terrain was. The other instance was at the end of the ice climbing sequence. Just before ascending the top of the ice shelf the user comes across a snowmobile stuck in a crevasse. I was immediately reminded of stories I've read of people falling into crevasses and dying. For me, this was visual storytelling that made the illusion of VR stronger. I had been following a path created by previous researchers, and seeing their transportation stuck in a crevasse made me imagine their fate. After taking a few moments to observe the stuck snowmobile the narrator explains that this must have happened while the researchers were away. The app is strategic in allowing users to observe and wonder before assuring them that no one was hurt. This tension, much like the penguin jump scare and the dramatic heights of ice climbing made the visual phenomenon feel more real and engage my other senses, including motion and the feeling of touching something.
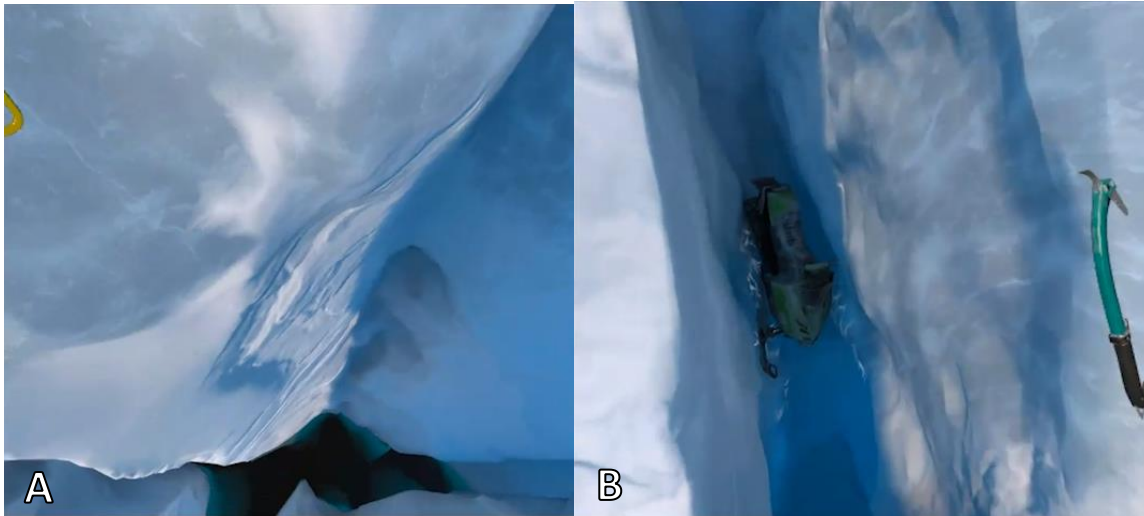
Figures 5.14: Sights from ice climbing in the Antarctic in *National Geographic: Explore VR*. Image A shows looking down. Image B shows a snowmobile stuck in a crevasse.

The Machu Picchu section of my gameplay log consists of far more touch actions than photography actions. The Machu Picchu assignment is highly guided, so almost all of my actions were led by narration. Similarly, the narrators tell the user where and how to capture photographs. Almost all of my photographs were prompted. I very rarely felt compelled to capture photographs out of my own free will. This assignment actually felt like completing a work assignment, which was its pretense. The narrators of this assignment also acknowledge that Machu Picchu is a simulation, which prevented the suspension of disbelief that occurred in the first assignment. When I did touch the simulation, I was touching objects to reposition them in virtual space or activating overlays through buttons and sliders. All of these aspects made it so that I did not experience much haptic visuality beyond using the camera itself.

The times that I did experience haptic visuality were when I looked closely at people and things that that were particularly detailed. One example was looking at the

mummy in the Mummy Ceremony Session. The mummy is very detailed and within the borders of the simulation, so I could get as close to it as I wanted to. At some points it felt irreverent to be so close to this mummy, simulated or not. This feeling was largely based on its detail, the texture of which affected my visuality. And again, realistic texture affected my visuality at the end of the assignment. One of the tasks in this assignment is to take pictures against the skyline. The skyline was a 360-degree photograph, and the details of the actual place enhanced my perception of the simulation.

The other parts of the simulation that engaged my visuality in a multisensory way were the palm interface and the photo desk. To pull up the assignment details and optional tasks, the user pulls their left wrist within their line of sight and opens their palm. From the open palm, a visual display opens (Figure 5.15 below). This felt incredibly natural, as if I were checking a watch on my wrist, even though the movement and result were different. The immediate response to my motion made it so that I felt like there was really something in my hand that I was checking. Of course, there was a controller in my hand that I was physically touching, but it felt as if I was touching this simulated device instead. Similarly, when I picked up photographs and put them into a bucket it felt like sorting trash from recycling. The motion was very natural and the ability to see and believe what I was seeing was enhanced by the motion.
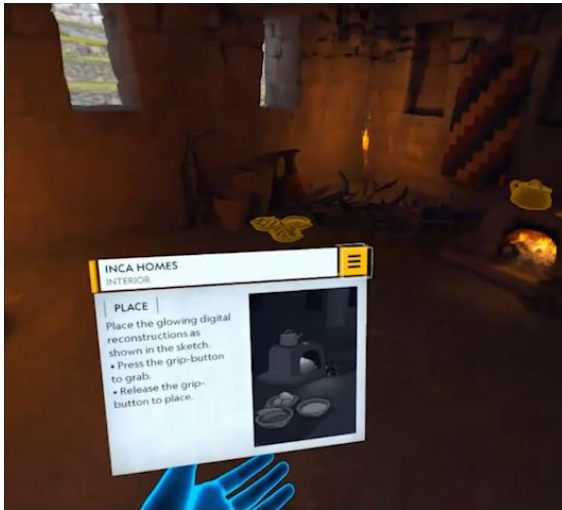
Figure 5.15: The palm interface at the Machu Picchu in *National Geographic: Explore VR*.

After completing the tasks for a specific area in Machu Picchu I looked through the optional photo assignments. This is where the two animal photograph tasks appear. One is with a condor and the other is with a lizard. The task for the condor is to take a picture of it over the Temple of the Condor. This condor flies in a continuous loop, so this is a timing challenge like in most platform games. I tried many times to get this picture and activate any accompanying narration, but I was never able to do so despite seemingly getting the photograph. The lizard photo task is to capture a picture of a lizard sunbathing on a rock. Similarly, a lizard alternates appearing and disappearing in different places on a loop. This is another timing challenge. I tried several times before getting the photograph (Figure 5.16 below) and activating the accompanying the narration. Natalie says, "This is an iguana, one of the three types of lizards you'll find roaming the estate. They lay in the sun because their bodies don't produce warmth on their own. A friend of mine once went to Peru just to see the iguanas." And Jose replies, "Yes, Peru is famous for many types of colorful iguanas!" This dialogue confused me

because this little lizard didn't look anything like what I thought all iguanas look like. After my playthrough, I googled "Peru iguanas" and found that iguanas do indeed include small lizards that I would have mistaken as another kind of lizard. However, if I wasn't writing this dissertation, I would have assumed that the visuals simply didn't match the dialogue. Providing sparse information can be confusing, which I will return to in the next chapter.
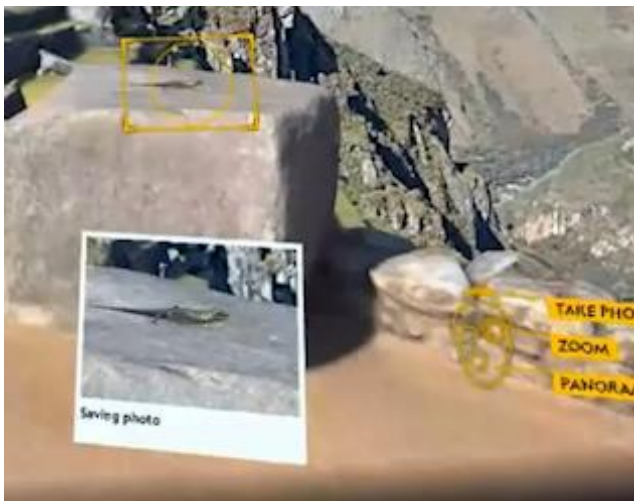


Figure 5.16: An iguana at Machu Picchu in *National Geographic: Explore VR*

I did not notice the other lizards that the narrator mentions in their dialogue. While other players may encounter them in their own playthrough, I was specifically looking for wildlife and did not notice them. The only other animals in Machu Picchu that I encountered were llamas. Llamas were occasionally at a distance and out of reach similar to how animals in the Antarctic were placed. However, there are some llamas that placed very close to the user. These may have been close enough to touch if not for an invisible barrier. When the user touches the barrier, a yellow circle with a line through it appears directly in front of the user and they cannot proceed (Figure 5.17 below). This

barrier appears at all of the edges of the environment, not just where the llamas are. This is an interesting design because not only are the llamas out of reach, but the user also encounters a visual sign that forbids them from getting any closer. The function and visual display of the invisible barrier severely limits how the user can see and engage with these simulated animals. The user cannot approach these creatures in the same way that they can approach simulated artifacts, such as a mummy, food, or ceremonial items.



Figure 5.17: A llama out of bounds at Machu Picchu in *National Geographic: Explore VR*

*Safari Central*

Despite *Wildeverse* and *National Geographic: Explore VR* having far more objects, interfaces, and intricate interactions, haptic visuality was very strong for me in this app. As I looked at the impossibly diminutive rhino in Figure 5.18 below, I tapped my table where I wanted it to move. Obviously, my table is not wired to my phone, and what I really needed to do was touch my phone to move the rhino. Similarly, there were moments where I meant to move something in the physical world, and I touched my

phone screen to move it as if it were a digital object. I did not make this mistake with *Wildeverse*. It was shocking to me that I made these mistakes even as I was playing these apps as a careful observer. I think studying if and how these tap mistakes occur in other AR apps would be a useful method in future AR studies.



Figure 5.18: Rhino on a $1 bill on a table in *Safari Central*

       I also tried to pose the AR animals around my world in ways that made sense (to a degree) and were interesting, which prompted me to think about how these animals could fit into my world. For example, I tried posing the animals on different surfaces and near my pets. When I could make these animals "fit" in my world, I was particularly pleased and chose to take a picture. By fit, I mean pose in a way that makes it seem like they are resting on a surface rather than hovering in space near it. This is similar to how other users have chosen to pose AR animals, as I showed in chapter two with the collage featured on the Safari Central website. Haptic visuality, for me, was increased when my

world and the AR animals fit together. However, this led me to pose animals in ways that treated them as miniature figurines, not the "real animals" that the app promotes.

*Wildeverse*

*Wildeverse* has by far the most objects, and it prompts users to touch all of these objects. Despite *so* many opportunities for haptic visuality, I rarely felt a strong sense of it. There was always some degree of suspended disbelief and choosing to touch an object via a screen, but there were no moments where I made the tap mistakes that I did with *Safari Central* and only a few moments where I felt like the AR world "fit" into the physical world. Part of this was, I think, due to the mismatch between my physical floor and forest AR floor. But I do not think this was enough to have such a dramatic effect on me. The unbelievably miniature animals of *Safari Central* arguably did not have such a strong effect. My methods are not well suited for trying to understand why one of these experiences may feel more immersive than another, but I do want to acknowledge that I had less of a sense of immersion with these objects. The few times that I did feel a stronger sense of haptic visuality were large objects fit into my space is realistic ways. One example is a sardine can fence (shown in Figure 5.19 below). This fence is used to warn researchers of approaching elephants so that they have time to flee a charge. The way that this object fit into my living space made other researchers' living spaces feel more real.

Figure 5.19: A can fence fitting into my living room in *Wildeverse*

In *Wildeverse*, users touch objects to scan them. Besides optional photography, the camera functions in a purely scientific way, though the user never gets to see how it works. The scans display as a loading bar. This design positions touch as necessary for discovery, but never leading to direct discovery through surfaces or interaction. Discovery through touch is always outside of what the user experiences—it only serves to collect "data" that the researchers explain in the chat log. This choice is in strange juxtaposition with the emphasis on tracking and personal experience that Espoir and Eka describe in chat log, shown in Figure 5.27 below. They emphasize the importance of "really looking" which they describe as tracking and putting data together. In the actual playthrough of this app, the "looking" and "putting together of data" happens behind the surface. The user can see an object, but all objects are tracked by a number counter and details gathered from objects are done by a scan. The details of the scan are not visual, and all data exists outside of the user's experience. The important work that the characters of *Wildeverse* describe is reflected in the actual playthrough.

**Table 5.12**

Wildeverse *Notes Excerpt – Espoir (Es) and Eka (E) Discuss Looking*

| Interaction Type | Details |
|---|---|
| Dialogue | Es: "We can't understand the decline and growth of ape numbers without a baseline!" |
| Dialogue | E: "when you start paying attention, I mean, like when you're tracking, the world really changes" |
| Dialogue | E: "and then when you start to put the data together and really think about what it means, everything changes in a different way " |
| Dialogue | E: " it's hard to explain" |
| Dialogue | Es: "There's a lot to be said for really looking." |

**Conclusion**

In this chapter I have summarized the results of my playthrough notes. These playthrough notes sought to answer the question *What kinds of relationships are facilitated between users and representations of wildlife by designing around photography in AR and VR?* My notes show that the camera and photography were always in service to something else, which I have compiled in below in Table 5.13. In *National Geographic: Explore VR*, photography was used to support the magazine and document research—not individual connections with wilderness and wildlife. In *Safari Central*, photography is used to raise actual money from users to support partner conservation organizations. In Wildeverse, photography is for raising money to support research and the camera is otherwise used as a research tool. These are the only ways in which these apps seek to connect users' wildlife and wilderness through photography and the camera.

**Table 5.13**

*Photography by App*

| App | Reason for capturing photos | Types of Photos |
|---|---|---|
| **National Geographic Explore VR** | Research Documentation. Magazine support. | Rare animals and rare animal groupings. |
| | | Reconstruction of natural and built environments |
| **Wildeverse** | Research. Raising money (theoretical). | Scans of plants, animals, and droppings. |
| | | Any photos of animals. |
| **Safari Central** | Raising money (actual) | Selfies or AR projections |

The camera creates an exigence for being in an environment but designing around photography did not use surfaces as a place to foster connection between users and representation of what they're connecting with. As shown in Table 5.14 below, the camera facilitates care—as connection and benefit for animals—through scientific education and research, raising funds for research, and supporting conservation. Designing around photography and the camera facilitated relationships between users and representations of wildlife that were solely researcher/subject and patron/recipient. This insight is critical for informing my answer to my second research question, *How can these designs be revised or leveraged for more beneficial environmental communication through care ethics?*, which I address in the next chapter.

**Figure 5.14**

*Caring Actions by App*

| App | Caring Action | Reason for Caring Action |
|---|---|---|
| **National Geographic Explore VR** | Capturing photos | Scientific research and public education. |
| **Wildeverse** | Scanning with camera | Scientific research |
| | Photography | Raising funds (for scientific research) |
| | Changing buying habits | Conservation |
| **Safari Central** | In-app purchases (photo roll) | Conservation |

CHAPTER SIX

DISCUSSION: APPROACHES FOR REDESIGNING ENVIRONMENTAL
COMMUNICATION AR AND VR APPS THROUGH CARE ETHICS

As I described in chapter five, my results surprised me; I was expecting more mixed results in terms of photography's ability to foster caring relationships between humans and (other) wildlife in these apps. In the same way that I planned for chapter five to carefully report how photography was used to facilitate care so that I could delineate its nuances, I initially planned for this chapter to discuss the implications of those nuances and suggest small ways in which those qualities could be leveraged or changed for future apps. However, my results have redirected my attention to how photography exists in these apps at large. Exigence, context, purpose, and competing interactive components all strongly affected the *experience* of taking photographs in these apps. The experience of taking photographs, and what users do with them afterwards, has become my primary lens for considering the topic of photography in *National Geographic: Explore VR, Safari Central*, and *Wildeverse*.

The goal of this chapter is to answer my second research question: *How can these designs be revised or leveraged for more beneficial environmental communication through care ethics?* My answer amounts to crafting three approaches for applying care ethics: 1) designing based on performances, 2) modeling behavior, and 3) engaging in a reflective photographic review process. The first approach focuses on how to let performances of wilderness and wildlife lead designs, which is largely informed by the new materialist and feminist materialist scholarship addressed in chapter two. The second

approach builds from situations where the user is paying attention to performances and intra-action to model caring behavior. The third approach invites users to reflect on their photographic process as well what they can learn from the surfaces of objects. These original approaches are the major contribution of this chapter, and each approach builds on the other. While all three are offered with photography apps in mind, the first two approaches could similarly be applied to other AR and VR apps that seek to facilitate care for wildlife and wilderness.

The first section below discusses how I apply care ethics to *National Geographic: Explore VR, Safari Central*, and *Wildeverse*, concerns that my application raises, and the approaches I craft in response to those concerns. Then, I proceed to outline my three approaches in detail. Each approach is the focus of one major section, explaining the approach builds from various scholarship addressed earlier in this dissertation, including ethics, game design, and new and feminist materialism. I explain how my suggestion applies to AR and VR by following their common affordances. In subsections I address how each approach could be applied to the apps I analyzed as examples for tailoring to *either* AR or VR based on the unique affordances of each. I conclude the chapter with a summary of the approaches and their significance. Most broadly, the major contribution of this dissertation is a critical discussion about how wildlife and wilderness are selectively captured or created for AR and VR apps that attempt to facilitate care. The three approaches presented in this chapter, and the reasoning behind them, suggest a scaffolding to support such a discussion.

**Applying Care Ethics**

Care ethics pushes us to trouble and open questions about our relationships so that we may put "caring at the heart of the search of everyday struggles for hope and flourishing of all beings" (Puig de la Bellacasa, 2017, p. 22). This includes examining what is done in the name of care. *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* all show an awareness for complicated situations and situate caring actions as their focus. However, their visualizations do not reflect this awareness and focus. Instead, care, and the difficult complexities around it, are discussed only in dialogue and rarely seen. When complexities around caring for wildlife and wilderness are seen (such as a piece of litter in the wildeverse), the representations are simplistic and do not include any unique action or experience. As I established from the results in the previous chapter, designing around a camera and photography sets up researcher/subject and patron/recipient relationships between users and the wilderness and wildlife that they engage with in these apps. While these relationships are important, they also severely limit the ways in which users can connect to wilderness and wildlife by under-developing these relationships and precluding other relationships. In this chapter I craft three design approaches for environmental communication in AR and VR apps: designing based on performances, modeling behavior, and a reflective photographic review process. While the first two approaches are not necessarily about photography specifically, they respond to the focus on surfaces fostered by photography and camera use. Designing around photography and the camera isn't all about the photographs themselves; it is about the *experience* of taking photographs, which can include interactions, choices, and reflection.

I identify care as in connection, being subject to unsettling curiosity (Haraway, 2013), and actions to benefit others, and researching is an important way to perform care. For issues related to the environment, research is critical for understanding phenomena that elude our senses. Some kinds of understanding that lead to caring action—such as remediating air and water quality that lies beyond typical human observation—can only be achieved through scientific study using specialized tools. It is not my goal to call into question the important work of scientific research and its validity in (sometimes) supporting care-based work. Similarly, I do not want to undermine the importance of donations, which can be one of the most direct ways to support large problems that individuals may have difficulty directly affecting. For example, I am not certain how I could more directly support Mweturia (the bull elephant from *Safari Central*) than by donating to its sanctuary organization. Rather than questioning the validity of the caring facilitated in these apps, I want to draw attention to three concerning qualities.

First, promoting a researcher or patron role (unnecessarily) excludes the performances of actions that facilitate curiosity about relationships between the user and more-than-humans. Recognizing more-than-human relationships includes acknowledging that the human is more than human (we are made up of other organisms) and that we participate in communities that extend beyond humans. For the researcher role in particular, the exclusion of performing actions that facilitate curiosity about more-than-human relationships is concerning for two reasons. First, scientific study is built around curiosity. Second, for all of the distance that scientific research requires (and celebrates), scientists are still humans responding to situational, more-than-human relationships out in

the field. Though this might be of little attention for most scientific research papers, it is important for the individuals. Merlin Sheldrake, a mycologist, writes about this poetically in his book *Entangled Life* (2020). He writes,

> There was something embarrassing about admitting that the tangle of our unfounded conjectures, fantasies, and metaphors might have helped shape our research. Regardless, imagination forms part of the everyday business of inquiring. Science isn't an exercise in cold-blooded rationality. Scientists are— and have always been—emotional, creative, intuitive, whole human beings, asking questions about a world that was never made to be catalogued and systematized. (Sheldrake, 2020, p. 18)

Since these apps try to create the *experience* of being a researcher, this is an important quality to consider. Additionally, personal understandings of nature are important for environmental communication (Ohara et al., 2019). The donor role is perhaps more perplexing than the researcher role because positive emotional responses are regarded as important for garnering donations (Paxton et al., 2020).

Second, there is no instruction or education about how to actually perform the researcher actions that the apps promote. If we are to seriously consider how AR and VR apps can facilitate caring actions *that are based in researcher work*, then why not create simulations that mimic what that work is actually like? Wildiverse uses the camera to garner donations and to scan objects, but there is no process of learning from these scanning actions. The information that is gathered for scientific study is never a part of the user's experience. That kind of information can be included on the object's surface or

a part of the experience later on. Many of the phenomena that are difficult to see, but are studied by gathering data, are not visually communicated by the apps. The shared affordances of AR and VR explained by Steffen et al. (2019)—diminish negative aspects of the physical world, enhance positive aspects of the physical world, recreate existing aspects of the physical world, create aspects that do not exist in the physical world—are not leveraged to communicate the data that the user collects. Or, in the patron role, these affordances are not used to communicate the unique qualities of individual animals and their dire situations. Instead, this is always communicated linguistically.

Third, the emphasis on the role of a researcher or patron comes at the exclusion of interactions that model behavior that could be performed in most users' everyday lives without changing careers. These caring behaviors could still be performed with difficult to access creatures in difficult to access places so that these apps continue to fill a niche in environmental communication. However, modeling caring behavior and prompting the user to enact it will provide opportunities for the user to practice different behaviors or skills. Caring actions extend far beyond collecting data and making donations, and if designers want to facilitate a wider range of relationships and connections, then we need to consider a wider range of interactions and simulations.

In response to these three concerns, I suggest three design approaches for environmental communication AR and VR apps: designing based on performances, modeling behavior, and a reflective photographic review process. These approaches accommodate Emily Johnson's (2021) communication strategies for VR educational games, which recommends designing around aesthetics, action promotion, and explicit

explanation. My approaches align with her strategies as designing based on performances for aesthetics, modeling behavior involves action promotion, and a reflective photographic process requires explicit explanation. The first two approaches work well for apps that are or are not centered around a camera and photography. The third suggestion is tailored to apps that already feature the camera and photography prominently in their design. These approaches also build on each other. For example, designing based on performances allows for better performance modeling and reflective processes. My approaches are a starting place for applying care ethics to AR and VR apps, and I do not intend to limit other perspectives and approaches nor prescribe what applying care ethics must look like. Rather, I hope to provide a fertile ground for developing new design choices in still emerging media forms.

I also want to highlight where these apps excelled in my playthroughs. *National Geographic: Explore VR* was very effective in creating haptic visuality and framing scenes with action events. In other words, this app excelled in using action events to direct the user's attention to certain areas at specific times. Of course, I cannot speak to the success of these action events for other users because my research did not seek to answer that question. However, their design at least made these efforts, and they were effective during my playthrough. The inclusion of a photo desk in *National Geographic: Explore VR* also presents some opportunity for photographic review and a useful area to expand. The immersion in *Safari Central*, despite being unrealistic, was very strong for me because objects "fit." Again, while I cannot say that this would be true for most users because this is not something I studied, I think it is important to recognize that featured

images of *Safari Central* show the animals "fitting" into their world, and that this is the only method of "rewilding" that the app invites users to practice. *Wildiverse* addresses complex issues through dialogue and creates compelling juxtapositions between animal/human waste and technology, calling into question the validity of that dichotomy. *Wildiverse* is also exceedingly ambitious by incorporating publicly accessible scientific data alongside difficult discussions, such as regarding air quality and wildfires. This app is also very inclusive, showing researchers of different racial and cultural backgrounds (such as Eka, who was modeled after the actual researcher Eka who wears a hijab) and addressing some different challenges that different groups of people face (such as the limited options that lead impoverished rural people to poaching and catching bushmeat).

**Designing Based on Performances**

Designing based on performances requires that designers look at the world around them and recognize the performances not just of people but also fauna, flora, fungi, lichen, and all other materials. This suggestion maps well with Johnson's (2021) strategy of designing for aesthetics, which also highlights the importance of surfaces for educational VR design. Surfaces are not neutral. In VR, all places are created; there is no neutral space. Even procedurally generated[11] space, which is designed based on the procedures the programmer writes, are still created within those prescribed parameters. Choosing to design based on performances means letting wilderness and wildlife

---

[11] All VR is programmed, but not all programming is procedurally generated. Procedurally generated content is a way of creating data algorithmically as opposed to manually. Manually creating data often includes a combing of human-generated content (including algorithms) with computer processing.

represented in a simulation have some agency in how they are represented. In chapter two I use trails as an example of how experiences can be domesticated without ever domesticating "nature" itself. These domesticated experiences are more accessible and are places to listen to a variety of material performances. I argue that AR and VR can present similar opportunities to walk a trail in nature with some phenomena being more accessible to us than on real trails. The trail domesticates experiences because it filters what hikers experience. Hikers become less subject to the material agency of the forest than they would in other situations, but when simulations are informed by material performances, then material agency ripples outward into the simulation.

One way to apply this approach is to use performances to frame situations. Designing with this approach in mind includes considering how materials *act* in a simulation. Not just how they look, but how they work rhetorically in the environment; how materials intra-act in ways that co-create the world with other materials. Framing situations based on intra-action means recognizing that it is "through specific intra-actions that phenomena come to matter—in both senses of the word" (Barad, 2008). In other words, events can unfold that both frame experiences and draw attention to the co-creation of the world through intra-action. Drawing users' attention to intra-action invites them to think about how materials perform—including on the surface in ways that are available to photograph—and their relationships with/as those performances. These more carefully curated experiences of (simulated) nature are one answer to applying care ethics. This approach also answers Bekoff's call to rewild media by facilitating

relationships between people and wildlife in ways that do not distance "us" from the "wild."

This approach requires careful observation of the places represented in the simulation. In some situations, it may even require scientific tools to understand how materials are acting. Instead of materials seemingly existing in a static way, designers of AR and VR apps can think about how materials acting in an environment can frame a situation. Situations in which it is difficult to perceive the actions of materials are precisely where both AR and VR excel in communication. Communicating difficult to visualize information uses the affordances of *recreating existing aspects of the physical world* and *diminishing negative aspects of the physical world* as outlined by Steffen et al. (2019). An existing example of this is the VR experience by designed by Stanford's Virtual Human Interaction Lab, which shows how carbon dioxide moves from cars to the atmosphere, oceans, and then acidifies the shells of pteropods.

This approach also extends to objects in simulations. Objects perform important actions that help us understand the actant power of materials. Providing some details and recognition for how these objects work and act can help users understand how their connections with materials often lie outside their immediate perception. This positions users not just as listeners to materials, but also gives them insight into *how* to listen to some materials. Objects were an important part of these apps because they guided interaction. Giving more attention to the relationships facilitated with these objects is important for thinking about how users can recognize performances in surfaces and aesthetics in AR and VR. In the sections below I explain how the apps I have analyzed

could be revised to incorporate this design approach as examples of how we might apply

this approach to AR *or* VR. In particular, I return to some of the examples mentioned in

the previous chapter that stood out from my playthroughs.

*VR Example - National Geographic Explore VR*

Designing in VR requires creating an entire experience (including games)

contained in a completely simulated world. It is impossible to recreate all of the world in

a simulation, and that is not what I suggest designs should attempt to do. Instead, I

recommend that designers consider how wilderness and wildlife exert power over the

user (and with/as the user). *National Geographic: Explore VR* includes dramatic

encounters at regular intervals, keeping the experience exciting and engaging throughout.

One instance of an exciting experience is when an Antarctic penguin jumps the of the

water and into the user's kayak (see Figure 6.1 below). Leading up to this event, the

penguin jumps in and out of the water theatrically near the user's kayak. If the user is

invested in getting a picture of this (like I was) or simply drawn to the movement, their

focus will be on the penguin. When the penguin defies its established pattern by jumping

into the kayak, it can be quite surprising and even illicit a jump-scare reaction (as it did

for me). Consideration for why a penguin may be compelled to jump onto a kayak is

unaddressed in the game. The performance of this penguin, though not impossible, was

curious but treated without curiosity. Curiosity about why a penguin might perform this

action could be raised through narration, such as Mike asking open question about the

penguin's motivations. Prompting users to be curious about performances can position

them as listeners without assuming motives for this (simulated) animal.

Figures 6.1: A penguin jumping into the user's kayak in the Antarctic in *National Geographic: Explore VR*. Image A shows the penguin leaping out of the water. Image B shows the penguin hitting the kayak (repeated).

  *National Geographic: Explore VR* also highlights effects of the environment at some points in the app. Examples include how the user must take shelter from the extreme cold and winds from the Antarctic storm, when ice breaks just after the user has cleared it during an ice-climb, when a snowmobile is trapped in a crevasse, and simply when the wind howls when the user must look down an icesheet (Figure 6.2 below). However, these situations focus the user on their own safety and can detract attention from the materials themselves. Rather than drawing the user's attention to the actant power of materials in ways that support learning and closer understanding, these experiences foster fear and distance. The actual Antarctic *is* a dangerous place that should include fear and knowledge of how to put distance between yourself and harm, but is designing around those aspects useful for this simulation? I am not suggesting that designers must censor these aspects to use this approach (designing based on performances); I only mean to question the *purpose* of including such aspects. If the

purpose is only to elicit an engaging fear response, then the design is better suited for a

horror game (a popular VR genre). If it is meant to elicit a different response, such as

reverence or respect, then it is important to shift some of the focus away from the user

and back to the materials themselves. For example, measuring ice loss or snow

accumulation during a storm would help users focus on the changing materials in the

environment independent of the user's immediate survival. Focusing on the user's safety

discourages reflection on the power of or reverence for materials. Of course, fear can be a

part of that experience as well, but again, the current design directs attention to the plight

of the user, not the interplay between user and materials.
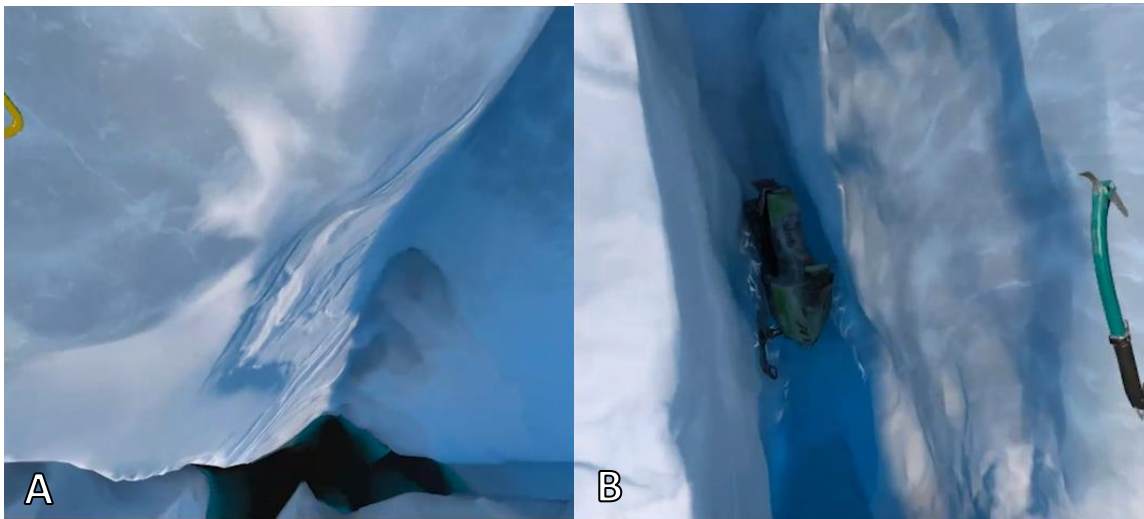


Figures 6.2: Sights from ice climbing in the Antarctic in *National Geographic: Explore VR*. Image A shows looking down. Image B shows a snowmobile stuck in a crevasse (repeated).

Interestingly, the second location of *National Geographic: Explore VR*, Machu

Picchu, takes a completely different approach from the Antarctic scenario. Instead of

emphasizing the danger of the wilderness and wildlife, it treats the app *as a simulation*.

Instead of eliciting fear-based responses for users' own well-being (some occurring on a

pure reactionary basis), this design alerts the user to their own ability to change their surroundings. Notably, these changes are intended to recreate how Incas lived and what Machu Picchu looked like when Bingham visited it for the first time. The interface at Machu Picchu engages the user by having them touch the simulation as a simulation. The app tells users to think about touching simulations, not the place it is representing. This design choice draws the user's attention away from what the materials are doing and towards how users/humans *should* change them based on their own objectives (Figure 6.3 below). While interacting with materials could be a very effective design choice for focusing the user's attention on how materials act on/with them, these tasks manipulate simulations, not materials. Their materiality is non-existent. Touching places, not simulations, is important for facilitating connections with and understanding for material performances—even in apps that are themselves simulations.



Figure 6.3: Machu Picchu in *National Geographic: Explore VR*. Image A shows a slider and image B show a button (repeated).

Additionally, the tasks at Machu Picchu situate the user's photographic work in the lineage of Hiram Bingham III by matching their photographs with his. Bingham's photos sit on a corkboard where the user begins the assignment, and they later recreate Bingham's photographs (Figure 6.4 below). All questions of lineage should pay attention to who is included, who is excluded, and the effects of these choices. Bingham was a Yale professor who "discovered" (in the words of *National Geographic: Explore VR*) the site while some indigenous people were living on it. He went on to take over 5,000 artifacts from the ruins without permission, which Yale's Peabody Museum of Natural History agreed to return in 2010 after nearly 100 years, a lawsuit from Peruvian government, and public pressure (Orson, 2010). The biopolitics of this place, the people who live there, and the materials taken are unaddressed in *National Geographic: Explore VR*. This is a critical material history (in the form of artifacts) that could have been addressed in the app. Bingham's expedition received funding from *National Geographic*, strengthening the lineage that *National Geographic: Explore VR* creates. By attempting to match Bingham's photos, the experience places a greater emphasis on relating to him than to the place, prioritizing an unproblematized lineage with Bingham. This design emphasizes lineage over individual experiences and connections with materials and their agency.

Figure 6.4: Machu Picchu in *National Geographic: Explore VR*. Image A shows a map and corkboard. Image B show a close-up of the corkboard (repeated).

Studying historical artifacts is one of the most established ways in which we listen to the performances of materials. We look at their surfaces to trace meaning across time and cultures. We estimate dates based on their composition and decomposition. Bingham displaced roughly 5,000 artifacts, hiding some—because he lacked permission to take them—and jumbling others with little record of where in Machu Picchu they came from (Llosa, 2010). Bingham's actions make it impossible to know exactly where each item was removed. *National Geographic: Explore VR* prompts users to create scenes with simulated artifacts, completely bypassing these issues from the expedition that they helped fund. One way to still design based on performances is to gamify studying these objects *as artifacts* and trying to find where they belong at the site. This design would have users interact with the site and artifacts *as themselves* and *belonging in a place* while recognizing the consequences of Bingham's actions. My suggestion here only serves to illustrate one way to apply my approach. There are many ways to address this

subject, and for an actual revision I would encourage designers to work with Peruvian scholars on the subject.

*AR Examples - Safari Central and Wildeverse*

Designing AR experiences based on performances requires thinking about how simulated objects "fit" into the physical world. This can be an incredibly difficult task. There are no set physical locations in either *Safari Central* or *Wildeverse*. Set locations can be common for AR when a target (what launches the AR simulation) is only located in one physical location (such as an AR experience tied to a specific park or museum). This allows for walking tours where users travel to each target and simulation. *Safari Central* and *Wildiverse* do not do that: these apps generate content wherever the user is located. Some important design choices make that possible, such as generating the simulation based on common targets (the floor, a face, currency, and printed logos). Other apps and web-based services do this as well: all face filters recognize faces, *Pokémon Go!* Now recognizes the floor to generate Pokémon in the user's room on-demand, and Google provides AR simulations of some animals for simple searches that will recognize the floor as a target.[12] For example, Google advertises "see a mantis at larger than life size" (*Mantis - Google Search*, 2022). Interestingly, *Pokémon Go!* is more committed to size accuracy than Google: Pokémon all have size data, and when users populate them in their room, they get a feeling for just how large (or small) their Pokémon is. Both *Safari Central* and *Wildeverse* are more similar to Google in their

---

[12] If you would like to try one of Google's AR animals, search "mantis" on your smartphone and then select View in 3D.

simulation design. Oddly, perhaps, given that Pokémon are all imaginary creatures, I argue for something more similar to *Pokémon Go!*.

How objects "fit" into my physical world was personally important for immersion in my playthroughs, but more importantly, "fitting" objects into space should consider how representations may exaggerate or diminish certain qualities. The larger-than-life mantis from Google may be larger so that users can observe certain features of the insect that are difficult to perceive otherwise. This purpose and application is yet another example of how communicating difficult to visualize information uses the affordances of *recreating existing aspects of the physical world* (the mantis) and *diminishing negative aspects of the physical world* (too small to see in detail) outlined by Steffen et al. (2019). But manipulating size in *Safari Central* and *Wildeverse* did not make the features of these AR animals more accessible. In *Safari Central*, animals are shrunk to a comical size where a jaguar, bear, rhino, and even an elephant can fit on the user's hand (see Figure 6.5 below for an elephant on a stack of books). Features of these shrunken animals are actually more difficult to see, and the naturally imposing size of these animals in comparison to humans is diminished.
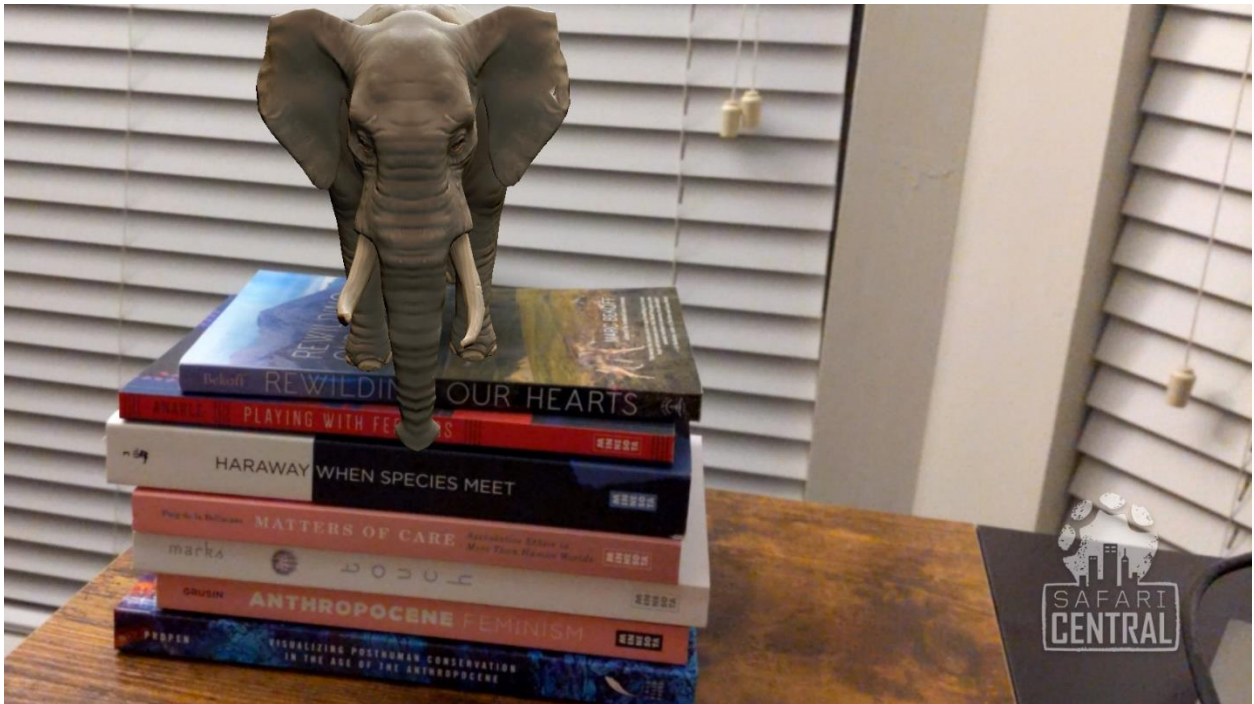
Figure 6.5: An elephant on books in *Safari Central*

Moreover, the AR animal representations in *Safari Central* are blatantly

sensational and over-represent aggressive or goofy features of wildlife. The animals of

*Safari Central* move in a way that caters to the user but has no context. For example,

Ethyl the grizzly bear stands and swats her paws into the air every few seconds after

moving around a few times (see Figure 6.6 below). This loop continues for as long as the

camera function is open. Atiaia the jaguar roars on loop, and the other animals display

similar cute or iconic actions. This overrepresentation of certain behaviors is one of the

qualities of petishism (Marks, 2002), and this design supports it. Repeating these actions

on a loop also represents animals in way that prevents any opportunity to listen to

performances. Designing based on performances includes designing encounters where

animals' performances have room to be interpreted (even if not completely or with

certainty of accuracy). Applying this approach to *Safari Central* could be as simple as interactive responses to touch from the user. Of course, these interactions would need to be carefully curated, which I will return to in my discussion of modeling caring behavior later in this chapter.



Figure 6.6: A bear next to a 15lb dog in *Safari Central*

*Wildeverse* does not shrink AR animals as severely as *Safari Central*, but primates still appear smaller than they would in real life. Buka is a silverback gorilla, which weigh 370 lbs. on average (Nichols & Carney, 2009), but in the wildeverse he appears only slightly larger than my 15lb dog (Figure 6.7 below). Again, scaling for animals' actual sizes can allow these megafauna's intimidating presences to be a part of the experience. Their intimidating presence doesn't need to facilitate fear; it could prompt something similar to the awe that guests hope to experience at zoos. These apps do not need to make zoos their benchmark, but if they are seeking to facilitate connections

between people and wildlife, the size of megafauna is an important aspect of those

creatures that affects our intra-actions. When representing much smaller species, such as

insects, being able to shift between actual size and a "magnified" view may be more

beneficial. This way, the size of the animal still makes an impression on the user, but

their features are also enhanced for a closer view. This closer view could mimic how real-

world insects are seen at a closer view, through lens magnification and cameras.



Figure 6.7: A gorilla and forest floor simulation (blue triangles) under a sleeping 15lb Dog

It's not just the animals in *Wildiverse* that play an important role; plants, research tools, animal tools, and (non-historical) artifacts tell a story of how animals, researchers, and local populations live in complicated relationships with each other. *Wildeverse*'s inclusion of so many location-specific objects shows that the app's designers prioritized researching and representing specific details of different locations. Their dedication to representing specific details of different locations is evidence that they value specific, material-informed representation. However, the user's relationship to these objects is conflicting and confusing. Users tap objects to interact with them, but what happens based on the tapping is limited to what users do *not* see. The results of touch elude the camera and photography. The only interaction users can have with objects is to scan them, and the only visualization for scanning objects is a loading bar. Interactions with objects that show information on the surface, especially in response to touch, would create more opportunities for users to feel connections with the performances of materials.

Providing visual information on the surface would also emphasize one of *Wildeverse*'s main claims: that tracking and understanding scientific information tells people (researcher NPCs) *about* what they're seeing in a way that changes *how* they see the world (Table 6.1 below). Additionally, these visualized interactions could leverage the affordances of AR, specifically allowing the user to see difficult to visualize information in their own physical space. This includes visualizing air quality and other scientific data that isn't normally seen on the surface. For example, the user could compare the air quality in the wildeverse (based on locations in Indonesia or Africa) to

their own home. The air quality could be visualized as a cloud, based on the information

that the app already links users to. These visualized interactions with objects should also

reflect a consistent interaction type. At some points in *Wildiverse* the user is able to

access physical information, such as DNA samples, and at some other points the user is

not able to interact physically, such as recovering a satellite phone. Treating these

performances as objects with consistent physical qualities and boundaries is important for

thinking about their performances. Treating these objects sometimes as simulations and

sometimes as physical objects is a conflicting narrative that creates muddles, distorts, and

obscures the performances of these materials.

**Table 6.1**

*Wildeverse Notes Excerpt – Espoir (Es) and Eka (E) Discuss Looking* (repeated)

| Interaction Type | Details |
|---|---|
| Dialogue | Es: "We can't understand the decline and growth of ape numbers without a baseline!" |
| Dialogue | E: "when you start paying attention, I mean, like when you're tracking, the world really changes" |
| Dialogue | E: "and then when you start to put the data together and really think about what it means, everything changes in a different way " |
| Dialogue | E: " it's hard to explain" |
| Dialogue | Es: "There's a lot to be said for really looking." |

**Modeling Behavior**

The most overt approach to applying care ethics that I suggest is modeling caring

behavior as an engagement tool. Engagement, I argue, is both the framing tool and the

goal in VR experiences. When VR creators want users to look in certain directions, they

want them to mentally engage with one frame of their world over another. Users choose

where to look in AR and in VR. The designer cannot know how long the user will take in any one spot or where they will direct their attention over time. Managing content in space (rather than over time) is important when designing AR and VR experiences as the user's self-guided pacing can be directed to some degree. In their interview with Sarah Hill of StoryUp, Melissa Bosworth and Lakshmi Sarah quote her saying, "so there is a frame, it's just that it's rotating inside the sphere, and it's your job as a storyteller to ensure they're looking in the appropriate direction" (2019, p. 197). Another industry creator, Max Saloman of Black Dot Films, talks about this challenge and calls guiding the users frame an "induced edit" (2019, p. 197). Any time spent designing a VR experience forces the creator to think about frames." Modeling caring behavior can be a way to frame situations and "induce editing" in AR and VR. This also fits Johnson's (2021) strategy of action promotion for education VR games because actions promotion can induce edits.

*National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* all include

some sort of caring behavior, but these caring behaviors are all indirect. As shown in

Table 6.2, caring behaviors in these apps include donating, scanning objects, generating

scientific documentation, and creating popular media. These caring behaviors are

centralized around taking photographs and using the in-app camera. Despite putting

surfaces into this privileged position, users are not encouraged to make connections with

animals or caring choices in response to them. The user's behavior in response to animals

and materials in these apps is unacknowledged at best and disruptive at worst. Modeling

caring behaviors based on animal and material behavior is one way to both frame AR and

VR experiences and prompt users to listen to animal and material performances.

**Table 6.2**

*Caring Actions by App* (repeated)

| App | Caring Action | What the Caring Action Serves |
|---|---|---|
| **National Geographic Explore VR** | Capturing photos | Scientific research |
| | Capturing photos | Public education |
| **Wildiverse** | Scanning with camera | Scientific research |
| | Photography | Raising funds (for scientific research) |
| | Changing buying habits | Conservation |
| **Safari Central** | In-app purchases (photo roll) | Conservation |

What should these caring behaviors look like? I propose listening to the people

who live and study in the locations that are simulated in the app, which the companies

National Geographic and Internet of Elephants seem to have consulted for designing their

apps. I address how *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse*

already seem to be tapping into these resources in more details in the subsections below,

and I go on to explain how they can be further developed to model caring behavior with visualized counter-factual designs. Counter-factual designs are already used in educational games, allowing players to make decisions that may or may not have been what was chosen in an actual event (H. J. Brown, 2008). They are suited for addressing situations when it is impossible to know exactly what or how something happened. Counter-factual games allow players to understand the difficulties in making choices, such as limited information, social pressures, incentives, and unforeseen circumstances. Counter-factual designs are particularly useful to apps that attempt to facilitate care for wilderness and wildlife because their performances can never be fully understood.

People who work with animals have to listen to their performances and make guesses at the animal's experience. For example Rothfels (2009) discusses the importance of relationships between animals and keepers in zoos. These relationships rely on keepers' attention and curiosity about the animals' actions. These relationships lead to decision-making and changes that affect animals' quality of life, such as when a keeper asked to modify an exhibit so that it was easier on a geriatric jaguar's joints. The zookeeper asked for this not because of the jaguar's age, but because they noticed changes in the jaguar's behavior. This keeper devoted attention to a jaguar's performances and allowed that to influence their dwelling. Rothfells advocates for this approach in thinking about how animals should be treated, writing:

> It was simple thoughtfulness that lead to the lowering of the jaguar's platform in
> the plans, but I think that sort of thoughtfulness needs to become a more central

part of our inquiries, absent as it understandably is in the stark photographs of

animals in "sad" -nonnaturalistic-cages.

*National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* do not present sad

cages; they do the opposite. They present pristine wilderness in a complete simulation or

overlayed onto the user's location. Rather than photographs of sad animals in non-

naturalistic settings, users are prompted to take pictures of animals who perform exciting

behaviors on loop, removing any choices about how the user should act. These

differences are significant, and caring behaviors in zoos are very different from in the

wilderness, but that doesn't mean modeling caring behavior cannot be included.

Additionally, modeling caring behavior does not need to be about problem solving.

Rather, it can be about listening the performances of wilderness and wildlife and then

adjusting behavior, such as providing distance and quiet.

AR and VR can prompt us to ask the right questions, such as these thoughtful

inquiries that can facilitate enacting performance ethics. In the subsection below, I

discuss specific ways this approach could be included in VR by looking at examples from

*National Geographic: Explore VR* as well as how it could be included for AR by looking

at examples in *Safari Central* and *Wildiverse*. More generally, all four of the affordances

of AR and VR that Steffen et al. (2019) outline support this design approach. These are

*diminishing negative aspects of the physical* world, *enhancing positive aspects of the*

*physical world*, *recreating existing aspects of the physical world*, and *creating aspects*

*that do not exist in the physical world*. Interactions with simulated wilderness and

wildlife are less dangerous (diminishing negative aspects of the physical world), positive

choices can be observed in greater detail than may be available in the physical world (enhancing positive aspects of the physical world), aspects of the real world are easier to access (recreating existing aspects of the physical world), and they can include situations that let the user practice listening to performances (creating aspects that do not exist in the physical world).

*VR Example - National Geographic Explore VR*

Modeling caring behavior is a framing tool through engagement, and in VR it is also a way for users to explore the VR space. A study by Markowitz et al. (2018) showed that exploring and engaging in virtual space was linked to users' understanding and recall of ocean acidification. Modeling caring behavior is a way to prioritize facilitating care in apps that seek to build those relationships, *and* it is an approach that responds to the needs (framing) and the strengths (exploration and learning) of VR. So then, an important question arises: what can caring behavior look like when users are engaging with simulations of wilderness and wildlife? Wildlife (and fragile parts of wilderness) are usually best left alone. There are still actions that users could take, and I address how these exceptions can be useful later in this section as well, but typically giving animals (and fragile places) distance is the most important caring behavior people can practice. This is where the camera becomes a critical tool for engagement. It allows users to observe distance that is comfortable for wildlife (or safe for places) while still allowing them to observe and listen to their performances.

*National Geographic: Explore VR* moves users along a rail design in the Antarctic, allowing users to alter the pace and move side to side to some degree. As users

move through the rail design, the app prompts users to notice how animals are acting around the user. Mike is the user's ever cheerful guide who speaks via headset, operating similarly to an omnipotent narrator. Mike's not actually omnipotent, but without any mention of the user wearing a camera, he somehow knows about what we see (such as ropes and boxes) from his ship. His narration guides how the user should feel by discussing physical environments (such as feeling cooped up after a long voyage) and describing our purpose for being in the Antarctic and our photography (research). At one point in the kayak, the user comes up on an Orca whale (Figure 6.8 below) and Mike says "Okay, take it easy now, you're quite safe; the Orca is just checking out your kayak." *National Geographic: Explore VR* prompts users to notice how the orca is acting around the user for their own safety, but not for anything else. It also does not suggest or model any behavior for the user. In this example, modeling caring behavior could mean keeping the kayak at a distance to give the orca its space. Redesigning for this approach could include navigating the kayak to a space that seems more comfortable for the orca or keeping it still enough to allow the orca to investigate. Completing movements (or no movement) is the most basic kind of videogame interaction. Gamifying this part of the experience could increase user engagement and model behaviors that situate the user as a listener to the animal's performances. Additionally, the camera can be a way for the user to see what is happening at a distance and the action event of the orca investigating (which might happen faster than the user can observe).
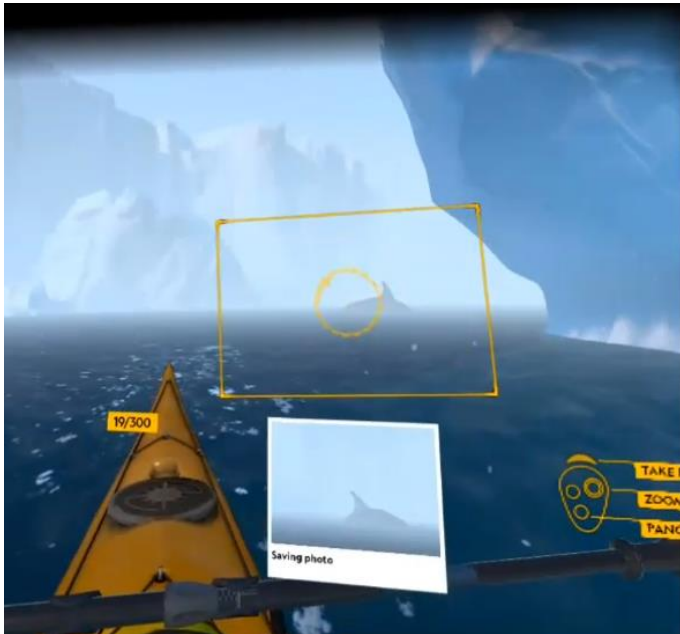
Figure 6.8: Taking a photograph of an orca in *National Geographic: Explore VR*

There are other times when *National Geographic: Explore VR* draws the user's

attention to danger. While ice-climbing, the more difficult route makes the user look

down at their height, and they hear howling wind. At the end of the more difficult route,

the user finds a snowmobile trapped in a crevasse, visualizing the danger of this icy

continent. After ice-climbing, the user has to perform maintenance on their campsite to

prevent hypothermia because a storm is approaching. All three of these events, which

lead up to the user finding the penguin colony in the morning, use strong emotional

responses to engage the user and prompt them to engage with the environment. These

interactions do not include using the camera, and they facilitate mild fear. Again, the

Antarctic is a terrain that should be respectfully feared; it is in an incredibly dangerous

and hostile environment to humans. However, treating this as a main way of engaging an

audience can overshadow other experiences that may better serve to facilitate care for an environment with or without use of the camera.

These high-emotion situations that prompt some fear do not necessarily need to be removed in order to facilitate care and connection, but if facilitating care is the main priority, they should be balanced with other kinds of experiences. Modeling caring behavior is one way to do this. Capturing photographs is the main way in which users enact care in this app, but users are not invited to use the camera in these high-stakes situations. One way to revise this design is to invite users to capture images of the stunning ice formations and height that are already designed to engage the user. Rather than relying on these experiences to only engage through fear, users could have objectives for observing certain kinds of ice formation, possibly documenting their decomposition. Similarly, capturing images of the snowmobile could be more difficult, requiring the user to use their camera to discover the terrain and assist in recovering objects. Preparing the camp site (Figure 6.9 below) for the approaching storm could also accommodate other camera-based interactions, such as capturing images of the location before and after the storm to see its effects.
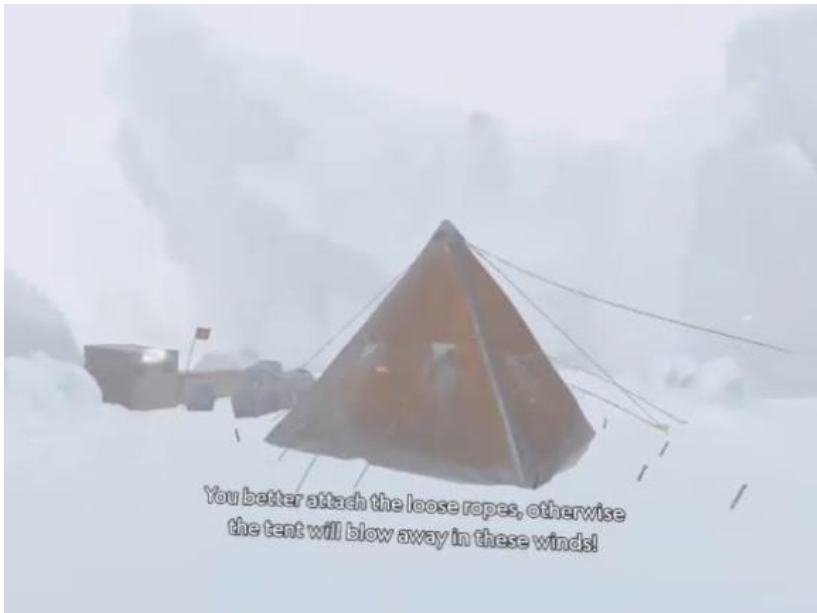
Figure 6.9: The user's campsite in a storm in the Antarctic in *National Geographic: Explore VR*

The caring behavior of capturing photographs to create documentation and support research supports *National Geographic: Explore VR*'s existing choice of facilitating a researcher/subject role between users and their environment. Again, this relationship is not problematic in itself, but the choice to *only* approach relationships in this way prevents other important means of connecting with wilderness and wildlife. Users could be prompted to capture photographs in these moments (and others) for other reasons, such as curiosity. Donna Haraway writes that "caring means becoming subject to the unsettling obligation of curiosity, which requires knowing more at the end of the day than at the beginning." (2013, p. 36). Treating curiosity as a caring behavior, the app could prompt users to observe the actions of animals through the camera. This could include observing how animals navigate around ice shelves and fragile ice or preparing for storms (such as taking shelter).

In Machu Picchu, *National Geographic: Explore VR* prioritizes recreating historical Inca sites and Bingham's journey. This priority overshadows any relationships with extant wildlife, wilderness, and people living with them. Rather than tweaking existing aspects of the experience, applying care ethics in this situation requires questioning who has been deemed worthy of care and what has been done for the sake of it. By centering care on Bingham's legacy and people that are no longer living, the descendants of the Inca (and their relationship to the site and stolen artifacts) are excluded. Wildlife and wilderness also play a subordinate role to Bingham and recreating the past. The only prompts to photograph wildlife and wilderness are optional and very few. At one point Natalie (one of the narrators) even says, "Epic shot. See how the jungle is creeping up on the terraces? We can fix that." The wilderness around the user is something to "fix." Additionally, visual barriers are placed between the user and wildlife (Figure 6.10 below). These barriers outline the limits of the experience that the user can explore. By placing wildlife beyond these borders, a visual barrier is placed between them if the users try to approach them more closely. Revising for the approach of modeling caring behavior in this part of *National Geographic: Explore VR* would include major revisions.

Figure 6.10: A llama out of bounds at Machu Picchu in National Geographic: Explore VR (repeated)

Major revisions to the Machu Picchu location would include a more complete look at Bingham's legacy by including perspectives from Peruvian scholars on controversies and (as much as they see fit) indigenous populations. Modeling caring behavior would be responsive to larger and alternative perspective, which is difficult to speculate about without actually having access to those perspectives. However, general measures include directing the user's attention and curiosity to how wilderness and wildlife have existed, and intra-acted, with the site for over a thousand of years. Treating the simulation as a real site where users can observe performances (and not "fix" their surroundings) is one way to facilitate curiosity. Not all aspects of the simulation's technology-based interactions need to be removed: the wrist interface is a very convenient way to display other information to the user, which could still be used to manage tasks or communicate some educational information. Finally, modeling caring behavior could involve careful examination of materials. Currently, objects in this

location are educational through voice-over descriptions and are only decorative visually. Requiring interaction and closer examination of artifacts in a way that acknowledges and respects the importance of their material location and significance to local people would be one way of modeling caring behavior. This would also be a useful opportunity to address the importance of consent when examining artifacts, such as ensuring there is permission granted from local people and/or their governing body.

*AR Examples - Safari Central and Wildeverse*

Modeling caring behaviors in AR requires making sure that the interactions "fit" into the user's physical location. When the targets for AR simulations are in one location, designers of the app can design for the specific location, but this is not the case for *Safari Central* or *Wildeverse*.[13] Instead, *Safari Central* responds to currency and printed targets and *Wildeverse* responds to the floor or ground. Modeling caring behaviors in location-independent situations presents different challenges—and opportunities—than VR. While VR presents opportunities to practice giving distance, putting wilderness and wildlife directly in front of the user requires more close encounters. Modeling caring behaviors in AR is well-suited for direct interactions and situations that require only a little distance. Again, the camera can be an important way of modeling caring behavior by supporting curiosity.

---

[13] If these apps were able to respond to the user's physical environment, they would be mixed reality not augmented reality. Applying these approaches to mixed reality may present fewer challenges than for augmented reality.

In *Safari Central* the animals are diminutive to a comical degree, but if these AR simulations more accurately represented these animals, then users could engage in caring behaviors that respond to their performances. Currently, there are no caring behaviors beyond taking pictures. Other caring behaviors, such as feeding and washing, would allow the app to feature interesting aspects of these animals without looping "trademark" behaviors continuously like they are automatons. While interacting with wildlife is generally not a behavior that benefits wildlife, the animals in *Safari Central* are sponsored by zoos and conservation organizations. Interactions can be based on how caretakers *actually* interact with these animals. Characteristics of each of these individual animals (not just the species) are provided in the app, as shown in Figure 6.11 below. Showing how animals behave and interact on the screen leverages the strength of AR. It also presents more opportunities to take pictures in the app. This reinforces the donor/recipient relationship with the animals, but perhaps these photographs could also reflect other kinds of relationships where users want to remember moments where they learned something about an individual animal.

Figure 6.11: Information about Beby in Safari Central (repeated)

Interaction in *Wildeverse* should be different from *Safari Central* because the wildeverse is supposed to be a projection of a scanned wilderness. Direct interactions are again problematic. While I suggest modeling caring behavior in interactions for *Safari Central*, *Wildiverse* presents a context where caring behavior likely includes adhering to specific distance boundaries between researchers and primates. *Wildeverse* does respect these boundaries prohibiting the user from getting too close to primates. When the user gets too close, the camera goes staticky, a red overlay appears, and a warning message displays. However, researchers who work with these specific animals do get in relatively close contact with them after a period of habituation. *Wildeverse* even discusses this time of habituation, explaining how orangutans will pee on researchers from trees until they are comfortable with the researcher's presence (habituated). In the chat log, one of the dialogue buttons that the user must select to move forward in the app after learning about

Sindelar 240

this is, "I want to go back in with a hat." This is one of the times that there is a contradictory discussion of place. The user is tasked with collecting urine samples and must say that they want a hat to wear (which implies physical interaction beyond the screen), but they are also never able to interact in the wildeverse because it is only a projected simulation (a physical interaction limited to a screen). If this contradiction is removed and the user must listen (and respond) to the performances represented in the simulation, more interesting interactions—and opportunities for caring behavior—open up.

Examples of modeling caring behavior in this app could include simulating this habituation time. The app already mentions, and consistently has users touch urine and fecal samples. Gamifying the habituation period could include making use of the hat and responding to the individual animal's cues. As I have observed throughout this chapter, I am suggesting that what we learn about through dialogue should be something that users also *see* on the surface of their screen. Seeing these encounters, which usually lie outside of most users' perception, makes use of the first principle outlined by Dunleavy (2014) for instructional AR games: *see the unseen*. Simulating these events and then challenging the user to practice them could make better use of the camera, letting users experience the challenge of achieving the right position and distance from animals for the image that they want to capture. Ideally, the user would be changing their behavior based on performances, thus gamifying the caring behavior of listening to and respecting an animal's performance. This gamification could even be scored and included in the score that *Wildeverse* already creates at the end of each session. These changes adhere to the

other two AR principles outlined by Dunleavy (2014): *enable then challenge* and *drive by gamified story*.

**Reflective and Exploratory Photographic Review Process**

The final approach I suggest, a reflective and exploratory photographic review process, is based on using the photography mechanic itself to prioritize surfaces as places of connection. While photorealism isn't a realistic option for AR or VR (we're nowhere near popular science fiction depictions), the experience of taking photographs can still include a reflective and exploratory process. This approach includes reviewing photographs as an equally important art of designing around photography and a camera as actually capturing images. This is a realistic approach because photographers sorting, editing, and thinking about what to convey in an image is a significant and detailed process (Kirk et al., 2006). More important than its realism, this is the part of the *experience* of photography where nature photographers can spend time formulating their own personal and scientific understandings of what they witnessed (or were unable to witness). When users are engaged in detailed looking that the camera provides, they have the opportunity to learn about what they encountered in more depth, which also fits Johnson's (2021) strategy of explicit explanation.

As I mentioned in the previous chapter, none of the cameras in *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* provide more detailed optical visuality than what the user already sees. This is a significant design choice because wildlife photography usually uses high quality cameras with optical zoom so that photographers can see qualities that are typically out of sight. Optical zoom is a true

zoom that provides the same resolution as when it is not zoomed in. Digital zoom, which is much easier to achieve, essentially pre-crops a photo before it is saved. *National Geographic: Explore VR* features a digital zoom, while *Safari Central* and *Wildiverse* feature no zoom at all. The choice not to include optical zoom means that the user never gets to explore surfaces, and their performances, beyond what they already see. A reflective review process would allow users to learn about what they saw and to better understand events that happened during their experiences based on what they did (or did not) capture in their photography.

In particular, action events where users must listen to performances present opportunities to practice caring behaviors that would later inform a reflective photographic review process. These action events would require the user to examine photos after the fact to discover what they could not immediately perceive and apply new knowledge to better understand the situation. Action events are already framing tools in AR and VR, and these events proceed quickly. A reflective process would invite the user to spend time thinking about what lies outside of their immediate experience. Again, all four of the affordances of AR and VR that Steffen et al. (2019) outline support this design approach. It is rare that people have cameras set up to elucidate difficult to observe situations with wildlife and wilderness, so using photographs for these situations deploys the *diminish negative aspects of the physical world* affordance. Designing apps that lead users photograph content that they can easily learn about later uses the affordance *enhance positive aspects of the physical world*. These action events can portray educational events, using the *recreate existing aspects of the physical world*

affordance. Finally, these action events could also include consequences and counter-factual events that would be damaging to create in the physical world, using the *create aspects that do not exist in the physical world* affordance.

Taking photographs in AR and VR are significantly different experiences, which is reflected in *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse*. Taking photographs in VR means that the user is capturing images in a completely simulated environment, giving the designer more control over the user's experience. Taking photographs in AR means that whatever the designer creates will be subject to the infinite possibilities of the user's physical world. Even if AR responds to a place-specific target, places change. Cameras, their interface, and physical touch type look very different in these media forms too. This can be observed in Table 6.3 below. In the section below, I discuss how a photographic review process can be incorporated into these different media forms and design parameters using *National Geographic: Explore VR* as example VR and *Safari Central*, and *Wildiverse* as examples for AR. Through these examples, I show that the approach of incorporating a reflective and exploratory process is flexible and closely tied to my earlier suggestions. In other words, performances and behavior choices provide the user something to which they can apply new knowledge and reflection.

**Table 6.3**

*Cameras and Interfaces by App*

| App | Camera in Interface | Interface Description |
|-----|---------------------|-----------------------|
| **National Geographic Explore VR** | DSLR/Other Professional Camera | Minimalist in Antarctica. Only a few highlights for guidance. Only touching objects. |
| | | Maximalist in Machu Picchu. Toggling interface options more than objects. |
| **Wildiverse** | Scanner crosshair. Camera button. | Overlay on the camera in the Wildiverse. More interface in the other parts of the app. |
| **Safari Central** | Camera button | Overlay on the camera. Simple animal selection outside of the camera. |

*VR Example - National Geographic Explore VR*

 *National Geographic: Explore VR* is a particularly interesting example for how to apply this approach to VR because it already has a desk built into the user's "base" for reviewing photos, which I will refer to simply as the "photodesk." As this app addresses, reviewing photographs happens in a dedicated place to preserve the immersive experience of existing inside a simulation. The photodesk allows users to scroll through their photographs, sort them into two buckets, and display them on the wall above the desk. Sorting at the photodesk is very simple: the only options are share and delete, which require the user to grab and drop the photograph into the respective bucket. The photodesk in *National Geographic: Explore VR* is a natural way for users to review their photographs in the app, but this review process does not provide opportunities for users to discover details about what they saw (or didn't see) or learn from these details. Applying a reflective and exploratory review process to VR includes not just creating a

space for this to occur but also providing the user with new visual information and accompanying educational dialogue.

As I mention earlier in this chapter, action events are useful framing tools, and they create an opportunity for the user to *later* learn about what they cannot perceive in the moment. This gives users practice in recognizing that important details lie outside of their perception and require careful, slower examination. As users review photographs at the photodesk, the narrator Natalie (who already speaks to the user in their "base") can also provide educational information about the photographs that users captured. These photographs, which are supposed to have been captured on a professional, magazine-quality camera, could present still images from actions that unfolded too quickly for the user to observe. For example, the encounters with the orca or penguin jumping onto the kayak could be addressed at this point to reveal what they were doing (such as looking at the user or fleeing a predator). Images of the orca in the current design only show a shadowy Figure, and there is no new information provided.

Another way a reflective and exploratory process could be used in *National Geographic: Explore VR* is to provide educational details about specific animals and materials. Again, this professional camera, which looks like a DSLR camera, would be capable of an optical zoom, which retains image quality upon zooming (see Figure 6.12 for an example). Currently, the user's camera does not retain the same image quality when zooming. Instead, when users zoom in, the yellow frame indicating the borders of the photograph is the only thing that changes. Omitting optical zoom prevents one of the important experiences related to capturing photographs: discovering what was previously

out of sight. In the Antarctic, examples include the strategically placed penguins at certain points in the game. Educational content could be species-specific, as it was throughout the adventure, but it could also disclose something about an individual animal's life. Scars, parasites, and behavior could all disclose aspects of specific animals, acknowledging their individual lives and allowing users to form relationships with them. I am not proposing that relationships with AR animals could or should replace all relationships with real animals, but in the same way that people in videogames can be fleshed out to foster moving relationships, so can animals. Going through these details could be performed at the photo desk, which is already built in the app.



Figure 6.12: Taking a picture of a penguin and hanging it up in *National Geographic*: Explore VR. Image A shows zooming in on the penguin Image B shows no greater detail in the zoomed photograph when it is placed on the wall by the photodesk.

For this approach to be applied in the same way at Machu Picchu, there must be more emphasis placed on the simulation existing as it is and not as something to be changed. The more power that the app gives to the user to alter the terrain, the less the app asks the user to notice (or care about) the world around them as it is. Still, there are

some optional tasks where users are asked to observe the world as it is, such as capturing

a photograph of an iguana (Figure 6.13 below). When the user does capture a photograph

of an iguana, one of the narrators (Natalie) tells the user, "This is an iguana, one of the

three types of lizards you'll find roaming the estate." At the photodesk, users could learn

about identifying features of different species. For example, the iguana the user sees in

the app (which appears to be a Peru Pacific Iguana) looks dissimilar to the iguanas of

North America (which are all invasive). The Peruvian iguana is never identified with any

detail, and it may be easily misidentified by the user.
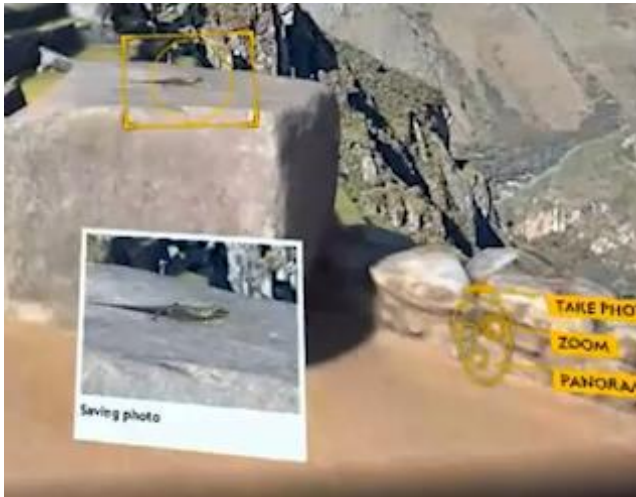


Figure 6.13: An iguana at Machu Picchu in *National Geographic: Explore VR* (repeated)

Finally, applying a reflective and exploratory review process could include

choosing images for specific audiences, prompting users to think about what message

they want their photograph to convey to certain audiences. In the current app design,

there is one audience (the printed magazine), which includes the cover and some images

to correspond to information that will be covered in magazine. The user cannot interact

with the actual magazine, but posters of the cover do decorate the user's "base." These

posters of the cover do not feature images that the user took during their photo

assignments. Instead, they feature well-composed, higher quality photographs of these

places that the user did not capture. To revise this design, *National Geographic: Explore*

*VR* could include multiple facets for where to share pictures, such as social media,

articles, and of course its iconic magazines, and (most importantly) prompt users to think

about and choose images based on their purposes and audiences. This would require the

user to learn about what the social media post, article, or magazine is addressing and

reflect on how their images work to support this exigence. This approach facilitates

advocational and educational relationships with wildlife and wilderness.

*AR Examples – Safari Central and Wildeverse*

A reflective and exploratory photographic review process in AR will work

differently than VR. Rather than having an entire virtual room to review photographs in,

an AR app has only a few inches of visual real estate. However, this is not too difficult a

design challenge at this point in time. A quick search on the Google Play Store or Apple

App Store will show many different photography editing apps that have already

addressed this challenge, and they could easily be added as a new tab in both *Safari*

*Central* and *Wildeverse*. With the acknowledgment that there may be many formats that

work well, I turn to Adobe Lightroom as an example because it is an industry standard in

photography. In Adobe Lightroom, users upload photos into albums, sort them into

folders, provide a star rating from 0-5, and flag images as accept, reject, or neutral. This

design allows users to quickly sort images before editing them. Editing photos in Adobe

Lightroom includes many options, which I will not detail here, but I will highlight a few

editing features. The clarity tool, dehaze tool, and detail tool can be used to emphasize

defining features that might be obscured by poor camera settings. Including options to

quickly sort photographs and then edit them for details that reveal visual information

would prompt users to explore and reflect on what these photographs show users.

Safari Central presents many opportunities to learn about specific animals and

their species, but these opportunities are presented only by textual means and are not

reflected in the animals' representations. Since photography is the main form of

engagement, and photography is based on animal representations, this design choice

severely limits the user's ability to listen to performances in the moment and afterwards.

Redesigning for listening to performances and modeling caring behavior would allow for

a rich photographic review process. Again, since AR situates the simulation in the user's

real world, the performances and interactions should "fit" into the user's world, which

more closely matches Safari Central's call to "rewild your world." Rewilding

(reconnecting) should include visualizations that prompt the user to make connections

between themselves and the animals represented in these apps. A photographic review

process for this app is more personal. It is the user and the user's world that are visually

rewilded in the app, and they should also reflect the personality of these specific animals.

These specific aspects could be partially observed in the moment and further revealed

upon reviewing the photos, again prompting the user to be curious about what they could

not perceive in the moment. For example, on the bio for Mweturia, the app says that he

"has mastered the art of breaking electric fences in order to enter farmer's fields" and has

"started teaching younger males his old tricks." The app could show inter-elephant instruction and later revealing what it leads to.

*Wildeverse* presents more opportunities to capture images of different aspects of wilderness (plants) and animals behaving normally in their natural habitats, but there is still nothing to be learned or gained from capturing photographs in the wildeverse. The app does not include a tab for reviewing photographs or include them in the actual app itself at all. In the beta version of *Wildeverse*, the user's photographs were stored in the Journal tab under each animals' section. This feature was removed by the time I began my formal playthrough. Even when photographs were stored in the app, there were no sorting or editing tools. Again, adding a review tab would allow users to learn more about their interactions and listen to the performances of wildlife and wilderness.

*Wildeverse* includes the behavior of "scanning" objects such as vegetation and scientific tools in every assignment. Applying this approach, users could capture simple images of vegetation and readings so that they could practice examining vegetation and the readings. This brings the "scanning" to the surface and into the user's mind. Scanning would not only be a touch task; it would also be an observational and analytical task. This suggestion would reinforce the researcher/subject relationship, but again, this is not in itself a problematic relationship. If *Wildeverse* was revised to include more performances of animals (such as Mweturia) and materials as well as modeling caring behavior, then reviewing photography could also include interpreting the behavior of animals as I have already outlined above for *Safari Central*. Similar to *National Geographic: Explore VR*, each non-player character (NPC) in the app could ask for photographs with different

purposes and audiences. Since *Wildeverse* acknowledges itself as a novel research tool in its narrative, the user's personal experiences of studying environments and interacting with wildlife in their own home would make sense as the topic for popular media (such as social media or magazines). This exigency again invites the user to think about what they want to convey in each image and reflect on their experiences.

**Conclusion**

In this chapter I have answered my second research question, *how can these designs be revised or leveraged for more beneficial environmental communication through care ethics?* Care ethics prioritizes troubling and questioning our relationships so that we may work toward the flourishing of all beings. In the previous chapter I presented my playthrough results, showing that the relationships that *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* facilitate are researcher/subject and donor/patron relationships between the user and wilderness and wildlife. This is partially based on how photography and the camera are used in these apps, and it is partially based on other design choices that affect what the user has the opportunity to take photographs of. I argue here that these relationships are too narrow and prevent personal connection. Further, the educational aspects of these apps are not visually communicated. Throughout this chapter I explain three approaches for revising the designs observed in these apps.

I suggest three approaches to move the camera into more of a privileged position by 1) creating opportunities to listen to the performance of wilderness and wildlife through the camera, 2) capturing images as a caring behavior and a way of remembering other caring behaviors, and 3) prompting users to engage in a reflective and exploratory

process with their photographs to learn about what they have witnessed and what eluded their ability to witness. The third approach facilitates educational and advocational relationships with wildlife and wilderness. Applying these approaches to AR *and* VR includes leveraging the affordances that these forms of media share. Applying these approaches to *either* AR or VR requires tailoring design choices to creating a completely simulated world or a partially simulated world that overlays itself on the user's real world. I use *National Geographic: Explore VR*, *Safari Central*, and *Wildiverse* as examples for revising AR and VR designs in general, but my approaches and their corresponding examples are not meant to limit the ways in which care ethics can be applied to AR and VR (or even apps specifically for tailored to facilitating care for wildlife and wilderness in them). These approaches should be a starting place generative of a larger conversation on the intersection between ethics and representing wilderness and wildlife in simulations.

CHAPTER SEVEN

CONCLUSION: IMPLICATIONS FOR
INDUSTRY, PEDAGOGY, AND FUTURE RESEARCH

I want to begin this conclusion by acknowledging that *National Geographic:*

*Explore VR, Safari Central,* and *Wildiverse* are exploratory, groundbreaking apps for

still-emerging media forms. These apps communicate environmental technical

information about wilderness and wildlife in ways that can set precents for future apps.

While there are a growing number of apps that do communicate technical environmental

information about wilderness and wildlife, the vast majority of previous games and apps

treat wilderness and wildlife as resources and decorations. *Safari Central* and *Wildiverse*

in particular took the time to base their apps, at least partially, on specific animals and

researchers. I am grateful for the leaps that these organizations took in creating such

exploratory apps. In this dissertation I have sought to build from what I have understood

as a common goal: facilitating care for wilderness and wildlife. The approaches I

suggested in the previous chapter, and the conclusion I provide here, aim to support this

goal.

In the previous two chapters, I have answered questions about what kinds of

relationships these apps facilitate in their design around photography and how these

designs can be revised for beneficial communication through care ethics. The approaches

I suggest apply care ethics in ways that still center around photography as well as

leveraging the affordances of AR and VR. I think these suggestions would be in line with

the goals of both app creators: National Geographic and Internet of Elephants. Indeed, I

hope that they are for other industry developers as well. In this chapter I address how the work from this dissertation may be of use to industry, pedagogy, and future research.

In my introduction chapter I explained that, despite the value of nature-based AR and VR, the ethical consideration of design has largely ignored representations of the environment. I argued that the field needs a critical discussion of how natural environments and wildlife are selectively captured through video or created through CGI and how these designs fit specified goals. I have attempted to start this discussion in this dissertation by analyzing three apps with methods from game studies and a critical lens informed by care ethics, new materialism, and feminist materialism. The approaches I have suggested are meant to be practical, something that industry creators can apply in their designs. They are also meant to inform a scholarly discussion, which includes the teaching of multimodal technical communication. And finally, as I have said previously, the approaches I suggest are not meant to be limiting; they are meant to be starting places.

In the following sections I outline how this dissertation can help inform industry, pedagogy, and future research. For industry, I discuss how the approaches that I suggest support the user on a practical level. For pedagogy, I turn to my own teaching. I discuss the lack of AR and VR technology in rhetoric and technical communication courses, offer two examples of how I have incorporated them into my class, and explore how this work can help inform a more in-depth discussion of rhetorical choices in AR and VR as well as composing projects. In the last major section, I address specific and big-picture questions that my dissertation raises and how they might be addressed in future research.

**Industry**

AR and VR are still emerging media forms, and their respective growths suggest a bright future for both. As I mentioned in my Introduction chapter, the global AR market is forecasted to expand at a compound annual growth of 43.8% through 2028 (*Augmented Reality Market Size & Share Report, 2021-2028*, 2021) and the global VR is forecasted to expand at a compound annual growth of 18% through 2028 (*Virtual Reality Market Share & Trends Report, 2021-2028*, 2021). Though AR is projected to grow to a much greater degree than VR, both are projected to grow incredibly fast over the next six years. It is unlikely that research can keep up with the pace of growth. This dissertation provides support for AR and VR designers who are seeking to facilitate care between users and wilderness and wildlife where there otherwise may be none in a time of high development. I present practical approaches for designing around a camera and an ethical framework that can be applied to generate other suggestions.

The approaches I suggest are based on my playthroughs with apps made by both a large organization (National Geographic) and a crowdfunded organization (Internet of Elephants). Despite their differences, they both sought to create connections with wilderness and wildlife in similar ways. Their designs produced researcher/subject and patron/recipient relationships that was under-developed and precluded other relationships. The approaches I suggest are meant to help guide developers and designers with similar goals. Both organizations created ambitious apps that create a path forward. Internet of Elephants is especially forward-thinking in including actual researchers from diverse backgrounds and individual animals with unique personalities. The approaches I

suggest are meant to support the ambitious goals of these organizations in ways that are realistic and easily apply to current design choices.

As AR and VR are two rapidly growing markets, any emerging strategies, approaches, and guidelines that are informed from research have the potential to influence the future of app development in ways that can cascade into future products. Or, to phrase this more negatively, rapid industry growth without research-informed strategies, approaches, and guidelines can negatively affect users as well as the industry creators. In a rapidly growing market, these apps are innovative and creative in their goals of working towards social good for more-than-human communities. I hope the approaches that I put forth help support the goals of organizations seeking to create connections with (and care for) wilderness and wildlife.

In general, my approaches push AR and VR designers towards deeper and wider influences so that they can create more detailed and nuanced simulations. These influences include physical environments and animals, the engagement tools and strategies of educational videogames, and the practices of real-life photography, all of which may require collaboration with subject matter experts. While the approaches I put forth are equally applicable to designers in industry as well as in academia, these approaches are in response to industry products and therefore tailored to the current market. Simulations, by their very nature, synthesize phenomena to create the illusion of a whole experience. Who and what informs this synthesis determines, at least in some part, the content and quality of a simulation. Designing a simulation is no simple task,

and the approaches I put forth for industry designers require considerable collaboration to add detail to their synthesis.

The influence from physical environments and animals requires industry creators to collaborate with people who study and work with different ecosystems. As I have acknowledged previously, Internet of Elephants makes bold design choices in collaborating with real people and modeling their Figures off of real animals. Applying my design approaches includes pushing the practices of Internet of Elephants even farther to support education and exploration with surfaces to facilitate care for wilderness and wildlife. This work cannot be accomplished without collaborating or consulting with subject matter experts, and *Safari Central* and *Wildeverse* both present jumping points for industry creators to expand from. These apps show how to include diverse organizations and backgrounds as an integral part of the design process, and my approaches prompt even closer listening to and integration of physical environments, animals, and subject matter experts.

Integrating videogame design, or even collaborating with videogame designers, is perhaps one of the easiest tasks for industry creators simply because there is such a large overlap between videogames and AR and VR in both software and CGI content. Many AR and VR apps are videogames and incorporating game elements into ones that do not fit a strict definition of a game can still enrich the app's purpose. In particular, I suggested using a counter-factual game design, which requires imagining and creating content for inaccessible perspectives. Again, incorporating this game design element requires collaboration with people who study and work with wildlife so that these AR and

VR experiences can simulate what it is like to interact with something outside of our

perspective and experience some degree of wonder and (when applicable) discovery

about those creatures.

Integrating influences from real-life photography may be the most difficult

approach for industry creators that I suggest because it requires developing more complex

apps. These complexities include action sequences that later reveal details, storage of

photographs, and some editing power for photographs. However, if designing around

photography is a priority in the app design, then these extra efforts are warranted. These

more complex designs again resemble videogames and may require collaboration with

videogame developers. Similarly, the photography editing aspect could draw from extant

photography editing apps (many of which already include AR) and include their

developers as collaborators.

**Pedagogy**

Despite the rapid growth of AR and VR (current and projected), they are both

under-incorporated media forms in multimodal composition and technical writing

classrooms. While there are certainly challenges and limitations to incorporating these

media forms in the classroom, it still offers benefits, even for lower-level classes. For

example, I include AR and VR in my first-year composition courses as well as in

introductory level technical communication classes. I include one or both technologies

not because I study them, but because AR and VR can make digital media *feel* real,

which is a powerful effect that is growing more available. It is important to prepare

students to both think critically about media that feels real as well as know how to

produce it. As AR and VR continue to grow, their strong affordances may be used for mis/disinformation. Preparing students to analyze AR and VR is important because it helps them think about why something *feels* real, or even true, without being so. Preparing students to create AR and VR content prompts them to think and compose spatially, giving them practice in applying spatial rhetorics. This could be a useful tool for future careers, or it could be a way for students to practice multimodal skills that transfer to other projects and careers. In this section, I explain teaching examples I've used in my classes and how this dissertation helps to develop a conversation that may be useful for future class discussions. In short, discussion about analyzing and creating physically immersive media quickly leads into questions about representation, and this dissertation offers practical considerations.

When I taught analysis of physically immersive media in my first-year composition courses, I chose to focus on examples that visualized data points in some way. My goals for this module were to 1) develop awareness of rhetoric in physically immersive spaces, 2) practice rhetorical analysis of physically immersive spaces and the communication within them, and 3) support criticism and accountability in physically immersive spaces. Outside of class time, I assigned some basic reading on VR data visualization and some video examples. I also assigned reflection writing assignments so that students could spend time on how these visualizations did or did not feel different to them. These reflections were very important since the feeling of the world is central to the unique rhetorical appeals of physically immersive media.

In the classroom, I introduced them to some technology and terms, both of which came quite naturally and quickly because it was hands-on learning. The technology that I introduced to them varied greatly. We started off using Google Cardboard (which only cost $2.50 each) for 360-degree videos, 360-degree experiences from independent websites, and phone apps designed for VR. It's worth mentioning that I'm an Android user myself, so making sure that these apps were all free and accessible on different devices was inherent to activity building. Later in the semester I took students to one of Clemson's VR labs to use other free apps on dedicated VR devices. After discussing some basics of data visualization, we addressed how classical approaches to rhetoric work with these emerging media forms. Some of the classical approaches we discussed were *pathos*, *logos*, *ethos*, and *kairos*. We also practiced applying the rhetorical situation to these media forms, including audience, author, argument, genre, exigence, and purpose. At the end of this module, students wrote a visual rhetorical analysis paper on the AR or VR experience of their choice, and I was consistently impressed with how well students engaged this assignment and practiced analysis on their own.

We applied the rhetorical situation to many different examples in class, such as a 360-degree video from the NASA Goddard Institute about hurricane Maria and a BBC 360-degree video about dinosaurs. Another example was called *In the Eyes of the Animal* by Iteota, to which students reacted the strongest. *In the Eyes of the Animal* was initially set up along a nature trail in the UK. Unsuspecting hikers were invited to wear a haptic backpack and an HMD. The experience was built off of lidar scans of the forest and sought to visualize (along with some haptics from the backpack) what it was like to be

some of the creatures in the forest. This lidar scanner (perhaps an older version) produced dots that were spaced somewhat far apart, and they were manipulated to show what it was like to be another creature in the forest. For example, the surface of a pond ripples out as a frog is radially aware of its environment as it ribbits. Plant matter was placed at the front of the HMD so that users could have additional touch experiences with the Earth as they imagined this animal's different perspective and kind of awareness.

In class we were able to go through the experience using their website and Google Cardboard, and then we learned about the original installation through their behind-the-scenes videos. Students identified strong *pathos* through world-changing use of data points, sounds, and visual storytelling. They also self-identified their own willingness to believe that this was how animals "see" because it felt real. The *ethos* was lost, however, when students learned that this was an artistic interpretation of the forest and not in any way an attempt to replicate how other animals *actually* see or understand their environment. Once students realized this detail, they felt a sense of betrayal, and our conversations quickly turned to the ethics of representing the experiences of wildlife. The theories I present in this dissertation, and applications of those theories, have prepared me to better address those discussions as they arise. In particular, I can now present care ethics as a way to productively question what is done in the name of care. In this case, making connections comes at the cost of creating a false narrative of animal experiences. This topic is now something I am prepared to address with an ethical framework as well as proposing alternative design options. I hope this dissertation may similarly help inform other instructors and classroom activity.

In my introduction to technical communication classes, students write about one broad environmental topic (such as swamps) throughout the semester. At the end of the semester, I have students create an engagement project where they try to engage a specific audience about how environmental degradation related to their topic affects marginalized groups more severely. They use the Google Street View app to capture 360-degree photos for free and create the photospheres on Google Story Spheres (also free). Within these spheres, students place audio files, creating an informational soundscape. One student, who wrote about caves (and mining) throughout the semester captured images around her neighborhood and in her house. She went into her neighborhood and took 360-degree photos near water and recorded audio files about mercury pollution from mining runoff. In one photosphere she had a friend put a pillow under their shirt and pose as pregnant for the audio file that addresses how pregnant women are at a higher risk for mercury poisoning. She also simulated a mine by using a crawl space in her house. For this assignment I only expect students to use their spaces creatively, because I'm looking for their ability to write and create with spatial rhetorics in mind. For assignments like this, I feel better prepared to provide students with approaches to apply in their own content creation. Out of the three design approaches I suggest—designing from performances, modeling behavior, and a reflective photographic review process—only the first two are applicable. These two approaches can help students think more about how they are using the spaces around them and what kind of engagement they want to encourage. Beyond the actual approaches, this dissertation invites a conversation with

students to consider how they are selectively choosing and representing places, and for what purpose.

Moving forward, this dissertation can help inform a more advanced class on technical environmental communication in AR and VR. Such a class could introduce students to the methods I've used in this dissertation as well as the basic principles of UX research and design. Ideally, this class could provide opportunities for students to test usability for real-world audiences and community engagement of their choice. Alternatively, a higher-level course like this could include collaboratively creating content for real-world audiences, which would include wire-framing, prototyping, and actual app development in Unity 2020. In a content-creation focused course, the approaches suggested in this dissertation would serve as one way to envision their design. Several books would fit this course, including Bosworth and Sarah's *Crafting Stories for Virtual Reality* (2019), which covers many use cases; Bucher's *Storytelling for Virtual Reality* (2018), which focuses on screenwriting for the medium; and Linowes' *Unity 2020 Virtual Reality Projects* (2020) textbook, which teaches readers how to create apps in Unity with no coding experience. In addition to these books, I hope the theories I've used to guide this dissertation, including care ethics, new materialism, and feminist materialism, would help students to think critically about their ethical framework choosing and representing wildlife and wilderness. I hope that the research from this dissertation can supplement these texts by prompting a discussion about ethics and selectively representing environments.

**Future Research**

I see this dissertation, and the future work that comes from it, as contributing to a collection of scholarship in technical communication that addresses the intersection of ethics and usability and user experience (UX). Hart-Davidson (2013) recognizes technical communicators as user advocates. In my work I seek to address these needs in environmental communication for the benefit of the user and the wildlife that is ultimately affected by users' experiences. I envision this critical discussion of how natural environments and wildlife are selectively captured through video or created through CGI as largely about usability and testing UX design. The ISO 9241 Ergonomics of Human System Interaction defines usability as "the extent to which a product can be used by specified users to achieve specified goals, with effectiveness, efficiency and satisfaction in a specified context of use" (Komninos, 2021). Presenting technical environmental information can be an issue of timing and managing complexity, something that usability studies would address.

Usability studies in physically immersive media present specific challenges. Kitalong and Moody (2009) explain that three-dimensional, multimodal installations require more complex usability evaluation methods than two-dimensional texts, and they propose narrative mapping as a method for accounting for changes within a given spatial and temporal context. Applying narrative mapping and other such spatially focused methods can provide important insight into how well information is delivered through time and space for users. This method may prove helpful in answering other questions

about nature-based AR and VR, especially for mapping why users explore in the sequence that they do and how much information they are absorbing at a time.

Other more common usability methods would be helpful in answering questions related to how the user's attention is directed and how well the media succeeded in solving a problem (such as understanding air pollution for gibbons in *Wildeverse*). Eye-tracking would help show where the user's attention is engaged during these apps and provide more data into what users are focusing on when they choose to capture a photograph. Similarly, interview questions could gather quantitative data about how users felt about the photography mechanic. For example, the *National Geographic: Explore VR* app excelled in using action events to direct the user's attention to certain areas at specific times. Eye tracking and interview questions could help evaluate how well action events actually achieved this effect. Or, for *Safari Central*, eye-tracking glasses could show whether users are directing their attention towards the screen or the real world when they are attempting to move the AR animals. These glasses could be combined with observations to see if they make the same touch mistakes that I did and interview questions about immersion. This would provide insight into the user's level of immersion and the physical experiences that accompany it.

*Wildiverse* is especially aspirational in its efforts to integrate public, local scientific data into entertainment apps and perhaps presents the most opportunities for future research. *Wildeverse* takes the user to air quality data (shown in Figure 7.2 below), but none of the technical information shown in the air quality data is explained in the app. Explaining the terms PM10 and PM2.5 and their health effects could be explored in AR

that leverages its unique visualization affordances. In this way, the users' initial interpretation of this information and how it may be improved would benefit future efforts of integrating public, scientific data into entertainment apps. *Wildeverse* also makes some other interesting choices, including artifacts of violence and providing dialogue that questions human exceptionalism. Looking at all this together, the issues of the user's health are explicitly bound up in the well-being of other people and animals while questioning what those relationships can look like. Put another way, technical information is situated in global, more-than-human contexts as well as personal contexts. Interviewing users' responses to the designs that try to communicate such difficult and complex topics and seeing where visualization may be most helpful would again benefit future apps. In other words, there is ample room to study where the affordances of AR may be best leveraged for technical environmental communication that seeks to create understanding and care for more-than-human communities.
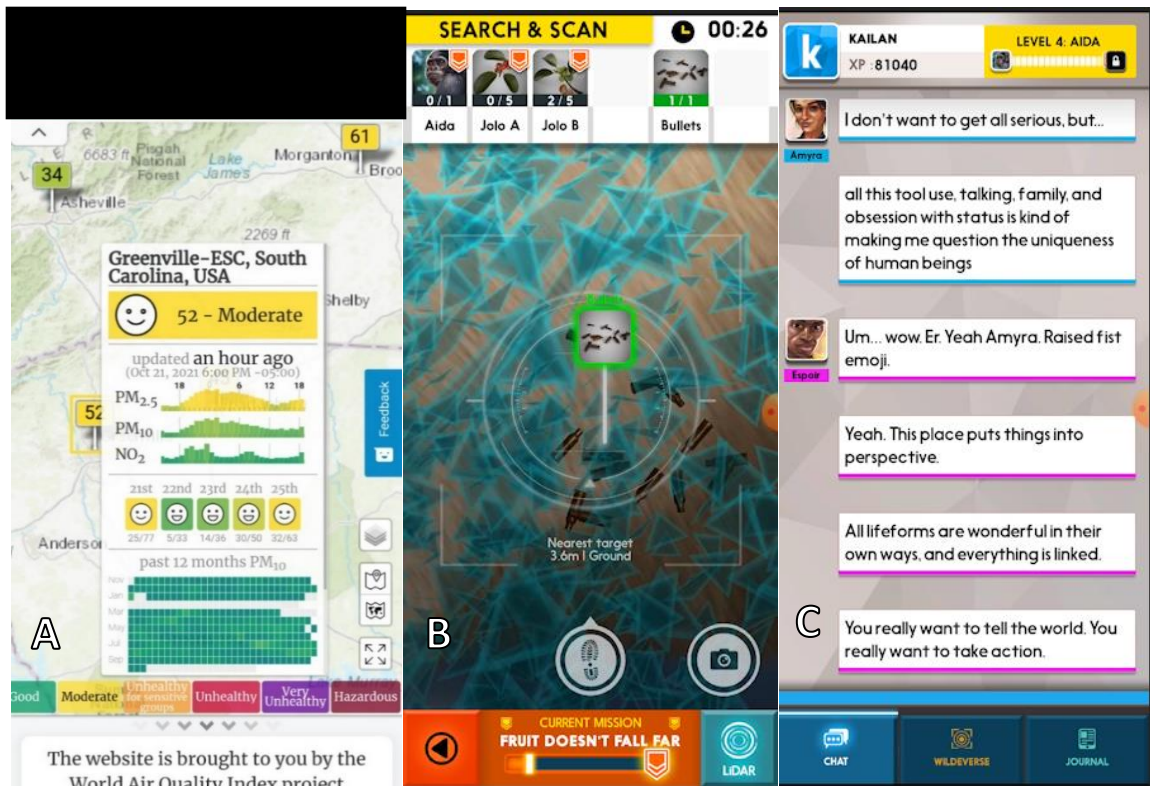
Figure 7.1: Screenshots from *Wildeverse*. Image A shows World Air Quality Index data. Image B shows scanned bullets in the wildeverse. Image C shows dialogue between Amyra and espoir questioning the uniqueness of humans.

## Conclusion

In this dissertation I began developing a critical discussion of how wilderness and wildlife are selectively created through CGI. Using methods from game studies and a methodological lens informed by care ethics, new materialism, and feminist materialism, my playthroughs disclosed that *National Geographic: Explore VR*, *Safari Central*, and *Wildeverse* facilitated limited researcher/subject and patron/recipient relationships by designing around photography. I then applied care ethics to these three apps to suggest three approaches for leveraging the affordances of both AR and VR to facilitate care for wilderness and wildlife in photography-centered apps.

The three approaches that I suggest—designing from performances, modeling

behavior, and a reflective photographic review process—are meant to inform industry

practices. AR and VR are currently experiencing a time of rapid growth, and this work is

meant to support more beneficial designs for both users and those who bear the

consequences of those users. This research is also meant to help prepare instructors who

want to engage in rhetorical analysis of AR and VR as well as support student

composition practices. Finally, this dissertation opens up more questions than it answers

and creates a starting place for future studies in AR and VR environmental

communication.

REFERENCES

Ahn, S. J., Fox, J., Dale, K. R., & Avant, J. A. (2015). Framing virtual experiences: Effects on environmental efficacy and behavior over time. *Communication Research*, *42*(6), 839–863.

Ahn, S. J. G., Bailenson, J. N., & Park, D. (2014). Short-and long-term effects of embodied experiences in immersive virtual environments on environmental locus of control and behavior. *Computers in Human Behavior*, *39*, 235–245.

Ahn, S. J. G., Bostick, J., Ogle, E., Nowak, K. L., McGillicuddy, K. T., & Bailenson, J. N. (2016). Experiencing Nature: Embodying Animals in Immersive Virtual Environments Increases Inclusion of Nature in Self and Involvement With Nature: EMBODYING ANIMALS IN IMMERSIVE VIRTUAL ENVIRONMENTS. *Journal of Computer-Mediated Communication*, *21*(6), 399–419. https://doi.org/10.1111/jcc4.12173

Alaimo, S. (2008). Trans-corporeal feminisms and ethical space of nature. In S. Alaimo & S. Hekman (Eds.), *Material feminisms*. Indiana University Press.

Alaimo, S. (2010). *Bodily Natures: Science, Environment, and the Material Self*. Indiana University Press.

Alaimo, S. (2017). Your Shell on Acid. In R. Grusin (Ed.), *Anthropocene feminism*. U of Minnesota Press.

Alaimo, S., & Hekman, S. (2008). *Material feminisms*. Indiana University Press.

Anable, A. (2018). *Playing with Feelings: Video Games and Affect*. U of Minnesota Press.

*Animal Equality*. (2016, January 29). Animal Equality | International Animal Protection

        Organization. https://animalequality.org/news/animal-equalitys-shocking-virtual-

        reality-film-gets-major-attention-at-the-sundance-film-festival/

Annerstedt, M., Jönsson, P., Wallergård, M., Johansson, G., Karlson, B., Grahn, P.,

        Hansen, Å. M., & Währborg, P. (2013). Inducing physiological stress recovery

        with sounds of nature in a virtual reality forest—Results from a pilot study.

        *Physiology & Behavior*, *118*, 240–250.

*Augmented Reality Market Size & Share Report, 2021-2028*. (2021). Grand View

        Research. https://www.grandviewresearch.com/industry-analysis/augmented-

        reality-market

Azuma, R. T. (1997). A survey of augmented reality. *Presence: Teleoperators & Virtual

        Environments*, *6*(4), 355–385.

Barad, K. (2008). Posthumanist Performativity: Toward an Understanding of How Matter

        Comes to Matter. In S. Alaimo & S. Hekman (Eds.), *Material feminisms*. Indiana

        University Press.

Bekoff, M. (2014). *Rewilding Our Hearts*. New World Library.

Bennett, J. (2001). *The Enchantment of Modern Life: Attachments, Crossings, and Ethics*.

        Princeton University Press.

Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Duke University Press.

Bogost, I. (2010). *Persuasive Games: The Expressive Power of Videogames*. Mit Press.

Bosworth, M., & Sarah, L. (2019). *Crafting Stories for Virtual Reality*. Routledge.

Breves, P., & Heber, V. (2020). Into the wild: The effects of 360 immersive nature videos
on feelings of commitment to the environment. *Environmental Communication*,
*14*(3), 332–346.

Brown, A. (2021). *Facebook Expects Metaverse Project Will Cost At Least $10 Billion—
In 2021 Alone*. Forbes.
https://www.forbes.com/sites/abrambrown/2021/10/25/facebook-expects-
metaverse-project-will-cost-at-least-10-billion-in-2021-alone/

Brown, H. J. (2008). *Videogames and Education*. ME Sharpe.

Bucher, J. (2018). *Storytelling for Virtual Reality*. Routlage.

Consalvo, M. (2008). Lag, Language, and Lingo Theorizing Noise in Online Game
Spaces. In B. Perron & M. J. Wolf (Eds.), *The video game theory reader 2*.
Routledge.

Consalvo, M. (2016). *Atari to Zelda: Japan's videogames in global contexts*. MIT Press.

Consalvo, M., & Dutton, N. (2006). Game analysis: Developing a methodological toolkit
for the qualitative study of games. *Game Studies*, *6*(1), 1–17.

*Conservation in Virtual Reality*. (2020). https://www.conservation.org/stories/virtual-
reality

Coole, D. H., & Frost, S. (2010). Introducing the New Materialisms. In *New
Materialisms: Ontology, Agency, and Politics*. Duke University Press.

Cox, R. (2013). *Environmental communication and the public sphere*. Sage.

Craig, A. B., Sherman, W. R., & Will, J. D. (2009). *Developing Virtual Reality
Applications: Foundations of Effective Design*. Morgan Kaufmann.

Dean, J. H., Shanahan, D. F., Bush, R., Gaston, K. J., Lin, B. B., Barber, E., Franco, L., & Fuller, R. A. (2018). Is nature relatedness associated with better mental and physical health? *International Journal of Environmental Research and Public Health*, *15*(7), 1371.

DeLuca, K. M. (2005). *Image politics: The new rhetoric of environmental activism*. Psychology Press.

DeMello, M. (2012). *Animals and society: An introduction to human-animal studies*. Columbia University Press.

Dickey, M. D. (2005). Engaging by design: How engagement strategies in popular computer and video games can inform instructional design. *Educational Technology Research and Development*, *53*(2), 67–83.

Doyle, J. (2007). Picturing the clima (c) tic: Greenpeace and the representational politics of climate change communication. *Science as Culture*, *16*(2), 129–150.

Duffey, S. (2011). Student Silences in the Deep South: Hearing Unfamiliar Dialects. In C. Glenn & K. Ratcliffe (Eds.), *Silence and Listening as Rhetorical Arts*. Southern Illinois University Press.

Dunleavy, M. (2014). Design principles for augmented reality learning. *TechTrends*, *58*(1), 28–34.

Edbauer, J. (2018). Unframing Models of Public Distribution 1: From Rhetorical Situation to Rhetorical Ecologies. In *Fifty Years of Rhetoric Society Quarterly* (pp. 165–182). Routledge.

Evans, L. (2018). *The Re-Emergence of Virtual Reality*. Routledge.

Evans, S. K., Pearce, K. E., Vitak, J., & Treem, J. W. (2017). Explicating affordances: A

    conceptual framework for understanding affordances in communication research.

    *Journal of Computer-Mediated Communication*, *22*(1), 35–52.

Eyman, D., & Davis, A. D. (2016). *Play/write: Digital rhetoric, writing games*. Parlor

    Press LLC.

Farner, S. (2019, August 19). *Is The Minecraft World Bigger Than Earth?* SVG.Com.

    https://www.svg.com/162612/is-the-minecraft-world-bigger-than-earth/

Fauville, G., Bailenson, J. N., & Queiroz, A. C. M. (2020). Virtual reality as a promising

    tool to promote climate change awareness. *Technology and Health*, 91–108.

Fauville, G., Queiroz, A. C., Hambrick, L., Brown, B. A., & Bailenson, J. N. (2020).

    Participatory research on using virtual reality to teach ocean acidification: A study

    in the marine education community. *Environmental Education Research*, 1–25.

Frasca, G. (2003). *Ludologists love stories, too: Notes from a debate that never took*

    *place.* 4–6.

Gartenberg, C. (2021, November 16). *Meta's Oculus Quest 2 has shipped 10 million*

    *units, according to Qualcomm*. The Verge.

    https://www.theverge.com/2021/11/16/22785469/meta-oculus-quest-2-10-

    million-units-sold-qualcomm-xr2

Gee, J. P. (2003). What video games have to teach us about learning and literacy.

    *Computers in Entertainment (CIE)*, *1*(1), 20–20.

Gerling, W. (2018). Photography in the digital: Screenshot and in-game photography.

    *Photographies*, *11*(2–3), 149–167.

Giddings, S. (2013). Drawing without light: Simulated photography in videogames. In *The Photographic Image in Digital Culture* (pp. 55–69). Routledge.

Glenn, C., & Ratcliffe, K. (Eds.). (2011). *Silence and Listening as Rhetorical Arts*. Southern Illinois University Press.

Greengard, S. (2019). *Virtual reality*. Mit Press.

Hackl, C., & Wolfe, S. (2017). *Marketing New Realities: An Introduction to Virtual Reality & Augmented Reality Marketing, Branding, & Communications*. Meraki Press.

Hansen, A., & Cox, R. (2015). *The Routledge handbook of environment and communication*. Routledge.

Haraway, D. J. (2013). *When Species Meet*. U of Minnesota Press.

Hekman, S. J. (2008). Constructing the ballast: An ontology for feminism. In S. Alaimo & S. Hekman (Eds.), *Material Feminisms*. Indiana University Press.

Herrera, F., Bailenson, J., Weisz, E., Ogle, E., & Zaki, J. (2018). Building long-term empathy: A large-scale comparison of traditional and virtual reality perspective-taking. *PloS One*, *13*(10), e0204494.

Hinske, S., Lampe, M., Magerkurth, C., & Röcker, C. (2007). Classifying pervasive games: On pervasive computing and mixed reality. *Concepts and Technologies for Pervasive Games-A Reader for Pervasive Gaming Research*, *1*(20), 1–20.

*If Seeing the World Helps Ruin It, Should We Stay Home? - The New York Times*. (2019). https://www.nytimes.com/2019/06/03/travel/traveling-climate-change.html?mc=aud_dev&ad_name={{ad.name}}&adset_name={{adset.name}

}&campaign_id={{campaign.id}}&ad-

keywords=auddevgate&subid1=TAFI&dclid=CNjzg7zdj-MCFYjYwAoddYcPbg

Jayaswal, S. (2008). *Basics of Photojournalism*. 31.

Jean, E. (2021, October 30). *Meta to Invest Heavily on Creators for AR; Original
Metaverse Creator Has "Nothing to Do" With Facebook Rebrand*. ITech Post.
https://www.itechpost.com/articles/107593/20211030/meta-invest-heavily-
creators-ar-original-metaverse-creator-nothing-facebook.htm

Jennings, S. C. (2015). Passion as method: Subjectivity in video games criticism. *Journal
of Games Criticism*, *2*(1), X–X.

Johnson, E. K. (2021). *ELLE-ments of Learning: A Framework for Analyzing Multimodal
Technical Communication Strategies in an Educational VR Game*. 1–4.

Jung, J. (2005). *Revisionary Rhetoric, Feminist Pedagogy, and Multigenre Texts*.
Southern Illinois University Press; e000xna.
http://libproxy.clemson.edu/login?url=http://search.ebscohost.com/login.aspx?dir
ect=true&db=e000xna&AN=960303

Juul, J. (2011). *Half-real: Video games between real rules and fictional worlds*. MIT
press.

Kastrenakes, J. (2021, October 25). *Facebook is spending at least $10 billion this year on
its metaverse division*. The Verge.
https://www.theverge.com/2021/10/25/22745381/facebook-reality-labs-10-
billion-metaverse

Kirk, D., Sellen, A., Rother, C., & Wood, K. (2006). *Understanding photowork*. 761–770.

Kirkley, S. E., & Kirkley, J. R. (2005). Creating next generation blended learning environments using mixed reality, video games and simulations. *TechTrends*, *49*(3), 42–53.

Klein, A., Sørensen, C., de Freitas, A. S., Pedron, C. D., & Elaluf-Calderwood, S. (2020). Understanding controversies in digital platform innovation processes: The Google Glass case. *Technological Forecasting and Social Change*, *152*, 119883.

Komninos, A. (2021). *An Introduction to Usability*. The Interaction Design Foundation. https://www.interaction-design.org/literature/article/an-introduction-to-usability

Koster, R. (2013). *Theory of Fun for Game Design*. O'Reilly Media, Inc.

Lanier, J. (2017). *Dawn of the new everything: Encounters with reality and virtual reality*. Henry Holt and Company.

Le Breton, D. (2017). *Sensing the world: An anthropology of the senses*. Bloomsbury Publishing.

Life, N. (2021, August 5). *New Pokémon Snap Passes Two Million Sales Outside Of Japan*. Nintendo Life. https://www.nintendolife.com/news/2021/08/new_pokemon_snap_passes_two_million_sales_outside_of_japan

Linowes, J. (2020). *Unity 2020 Virtual Reality Projects: Learn VR development by building immersive applications and games with Unity 2019.4 and later versions* (3rd ed.). Packt Publishing Ltd.

Llosa, A. V. (2010, April 10). Call Him Andean Jones. *Wall Street Journal*.

    https://www.wsj.com/articles/SB1000142405274870358090457513198135215347

    78

Malone, T. W. (1981). Toward a theory of intrinsically motivating instruction. *Cognitive*

    *Science*, *5*(4), 333–369.

*mantis—Google Search*. (2022).

    https://www.google.com/search?kgmid=/m/03gw60r&hl=en-

    US&q=Mantis&kgs=0acdfc47bf5b33ac&shndl=17&source=sh/x/kp/osrp/4&entr

    ypoint=sh/x/kp/osrp

Markowitz, D. M., Laha, R., Perone, B. P., Pea, R. D., & Bailenson, J. N. (2018).

    Immersive Virtual Reality Field Trips Facilitate Learning About Climate Change.

    *Frontiers in Psychology*. Gale Academic OneFile.

Marks, L. (2002). *Touch: A Sensuous Theory and Multisensory Media*. University of

    Minnesota Press.

Mäyrä, F. (2008). *An Introduction to Game Studies*. Sage.

Murray, J. (2013). The last word on ludology v narratology (2005). *Janet H. Murray*, *28*.

Nichols, M., & Carney, E. (2009). *Face to Face with Gorillas*. National Geographic

    Books.

Norlock, K. (2019). Feminist Ethics. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of*

    *Philosophy* (Summer 2019). Metaphysics Research Lab, Stanford University.

    https://plato.stanford.edu/archives/sum2019/entries/feminism-ethics/

Norman, D. A. (2002). *The Design of Everyday Things*. Basic Books, Inc.

Nukarinen, T., Rantala, J., Korpela, K., Browning, M. H., Istance, H. O., Surakka, V., & Raisamo, R. (2022). Measures and modalities in restorative virtual natural environments: An integrative narrative review. *Computers in Human Behavior*, *126*, 107008.

Oculus Quest 2 Cumulative Sales Hit Record 4.6 mn. (2021, July 14). *Counterpoint Research*. https://www.counterpointresearch.com/xr-headset-shipments-almost-triple-yoy-q1-2021/

Ohara, N., Yamanaka, Y., & Trencher, G. (2019). Understanding Nature through Photography: An Empirical Analysis of the Intents of Nature Photographers and the Preparatory Process. *Environmental Communication*, *13*(8), 1053–1068.

Orson, D. (2010). Yale Returns Machu Picchu Artifacts To Peru. *National Public Radio, All Things Considered*.

Ouariachi, T., Olvera-Lobo, M. D., & Gutiérrez-Pérez, J. (2017). Analyzing climate change communication through online games: Development and application of validated criteria. *Science Communication*, *39*(1), 10–44.

Oxford English Dictionary. (2020, September 18). *"care, n.1"*. https://www.oed.com/view/Entry/27899?rskey=9MATad&result=1&isAdvanced=false

Parkin, S. (2014, January 23). A Journey to the End of the World (of Minecraft). *The New Yorker*. http://www.newyorker.com/tech/elements/a-journey-to-the-end-of-the-world-of-minecraft

Paxton, P., Velasco, K., & Ressler, R. W. (2020). Does Use of Emotion Increase

    Donations and Volunteers for Nonprofits? *American Sociological Review*, *85*(6),

    1051–1083. https://doi.org/10.1177/0003122420960104

Perry, J., Klopfer, E., Norton, M., Sutch, D., Sandford, R., & Facer, K. (2008). *AR gone*

    *wild: Two approaches to using augmented reality learning games in Zoos*.

*Pokémon Go Live Player Count and Statistics*. (2021, February 16).

    https://activeplayer.io/pokemon-go/

*Pokémon Go Revenue and Usage Statistics (2022)*. (2017, August 8). Business of Apps.

    https://www.businessofapps.com/data/pokemon-go-statistics/

Poremba, C. (2007). Point and shoot: Remediating photography in gamespace. *Games*

    *and Culture*, *2*(1), 49–58.

Propen, A. D. (2018). *Visualizing Posthuman Conservation in the age of the*

    *Anthropocene*. The Ohio State University Press.

Puig de la Bellacasa, M. (2017). *Matters of Care: Speculative Ethics in more than*

    *Human Worlds* (Vol. 41). U of Minnesota Press.

Rachels, J., & Rachels, S. (1986). *The elements of moral philosophy*. Temple University

    Press Philadelphia.

Riggs, S. (2019). *The End of Storytelling: The Future of Narrative in the Storyplex*. Beat

    Media Group.

Riva, G., Mantovani, F., Capideville, C. S., Preziosa, A., Morganti, F., Villani, D.,

    Gaggioli, A., Botella, C., & Alcañiz, M. (2007). Affective interactions using

virtual reality: The link between presence and emotions. *CyberPsychology & Behavior*, *10*(1), 45–56.

Rothfels, N. (2009). Zoos, the academy, and captivity. *Pmla*, *124*(2), 480–486.

Schrock, A. R. (2015). Communicative affordances of mobile media: Portability, availability, locatability, and multimediality. *International Journal of Communication (Online)*, *Journal Article*, 1229.

Sheldrake, M. (2020). *Entangled life: How fungi make our worlds, change our minds & shape our futures*. Random House.

Sherman, W. R. (2019). *VR Developer Gems*. CRC Press.

Sherman, W. R., & Craig, A. B. (2003). *Understanding Virtual Reality: Interface, Application, and Design*. Morgan Kaufmann.

Shields, R. (2003). *The Virtual*. Psychology Press.

Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*, *78*, 64–73.

Shotwell, A. (2016). *Against Purity: Living Ethically in Compromised Times*. U of Minnesota Press.

Sicart, M. (2011). Against procedurality. *Game Studies*, *11*(3), 209.

Sicart, M. (2013). *Beyond Choices: The Design of Ethical Gameplay*. MIT Press.

Silverman, A. M. (2015). *The perils of playing blind: Problems with blindness simulation and a better way to teach about blindness*.

Smith, J. A. (2003). Beyond dominance and affection: Living with rabbits in post-humanist households. *Society & Animals*, *11*(2), 181–197.

Sontag, S. (1977). *On photography* (Vol. 48). Macmillan.

Sontag, S. (2003). Regarding the pain of others. *Diogène*, *1*, 127–139.

Sontag, S. (2004). Regarding the torture of others. *New York Times Magazine*, *23*(5), 4.

Speicher, M., Hall, B. D., & Nebeling, M. (2019). *What is mixed reality?* 1–15.

Squire, K., Jan, M., & Mathews, J. (2007). The design and use of simulation computer games in education. *The Design and Use of Simulation Computer Games in Education*, 264–296.

Steffen, J. H., Gaskin, J. E., Meservy, T. O., Jenkins, J. L., & Wolman, I. (2019). Framework of affordances for virtual reality and augmented reality. *Journal of Management Information Systems*, *36*(3), 683–729.

Stormer, N., & McGreavy, B. (2017). Thinking ecologically about rhetoric's ontology: Capacity, vulnerability, and resilience. *Philosophy & Rhetoric*, *50*(1), 1–25.

*The Stanford Ocean Acidification Experience*. (2020). https://vhil.stanford.edu/soae/

Todd, A. M. (2010). Anthropocentric distance in National Geographic's environmental aesthetic. *Environmental Communication*, *4*(2), 206–224.

Tuan, Y.-F. (1984). *Dominance and affection*. Yale University Press.

Tuana, N. (2008). Viscous porosity: Witnessing Katrina. In S. Alaimo & S. Hekman (Eds.), *Material Feminisms*. Indiana University Press.

Vealey, K. P., & Layne, A. (2012). Feminism, object-oriented ontology, and the practices of scholarly work. In J. J. Royster & G. E. Kirsch (Eds.), *Feminist Rhetorical*

*Practices: New Horizons for Rhetoric, Composition, and Literacy Studies*. SIU Press.

Vie, S. (2008). Tech Writing, Meet Tomb Raider: Video and computer games in the technical communication classroom. *E-Learning and Digital Media*, *5*(2), 157–166.

*Virtual Reality Market Share & Trends Report, 2021-2028*. (2021). Grand View Research. https://www.grandviewresearch.com/industry-analysis/virtual-reality-vr-market

Walsh, L., Rivers, N. A., Rice, J., Gries, L. E., Bay, J. L., Rickert, T., & Miller, C. R. (2017). Bruno Latour on rhetoric. *Rhetoric Society Quarterly*, *47*(5), 403–462.

Webber, J. E. (2019, February 25). Point and shoot: What's next for photography in video games? *The Guardian*. https://www.theguardian.com/games/2019/feb/25/point-and-shoot-whats-next-for-photography-in-video-games

*What is Nature AR-Book*. (2022). App Store. https://apps.apple.com/us/app/what-is-nature-ar-book/id1531510357

White, M. P., Yeo, N. L., Vassiljev, P., Lundstedt, R., Wallergård, M., Albin, M., & Lõhmus, M. (2018). A prescription for "nature"—The potential of using virtual nature in therapeutics. *Neuropsychiatric Disease and Treatment*.

Zou, Y. rock, Mustafa, N., Memon, N. A., & Eid, M. (2015). *ECO ECO: changing climate related behaviors for cellphone-based videogames*. 1–5.

APPENDICES

Appendix A

National Geographic Explore VR Notes

Object Inventory:

| Object | Effects | Value | Sharable | Tradable? | Other Details |
|---|---|---|---|---|---|
| Camera | Takes photographs | N/A in app | No | N/A in this app | Screen reads "Please look through the viewfinder to take a photo" or shows most recently captured photo |
| Photographs | N/A | | Yes | | Only sharable on Facebook. Can also be displayed at base or deleted . Max of 300. |
| Cell phone | Unlockable function of co-op | | No | | Unlocks after missions are complete. Rings. |
| National Geographic Magazine Poster: Emperors of Ice | Collectable | | No | | Collected after completing the Antarctic Mission |
| National Geographic Magazine Poster: Machu Picchu | Collectable | | No | | Collected after completing the Antarctic Mission |
| Whale decoration | Collectable | | No | | Collected after completing the Antarctic Mission (no such reward for Machu Picchu) |

**Antarctic**

| Object | Effects | Value | Sharable | Tradable? | Other Details |
|---|---|---|---|---|---|
| Kayak | Enables travel over sea | | No | | |
| Kayak Paddles | Steers and speeds up kayak | | No | | |
| Pickaxes | Enables ice climbing | | No | | |
| Tent Rope | Necessary to proceed through app | | No | | |
| Zipper | Opens tent | | No | | |
| Kerosene Lamp | Illuminates tent | | No | | Acts like touch lamp. |
| Sleeping Bag | Necessary to proceed through app | | No | | Not recognized without wearing goggles. |
| Crates | Necessary to proceed through app | | No | | |
| Goggles | Necessary to proceed through app | | No | | Must be wearing to recognize finding sleeping bag |
| Rope | N/A | | No | | |
| Personal Locator Beam | Can summon a helicopter at the end of the mission | | No | | Three parts to object. Helicopter comes without use. |
| Supplies - Sardines | N/A | | No | | Sardines |

| | | | | |
|---|---|---|---|---|
| Supplies - Cans | N/A | | No | Mune |
| Supplies - Box | N/A | | No | Looks like medicine box with small text. Man's face and "Uncle Hans" |

**Machu Picchu**

| | | | |
|---|---|---|---|
| Machu Picchu Hat | Accessory | No | Wearable at Machu Picchu Entrance |
| Pot | Can be placed on pot | No | Highlighted |
| Stove | Can hold pot | No | |
| Food Bowl - Maize | Can be moved | No | Highlighted |
| Food Bowl - Potatoes | Can be moved | No | Highlighted |
| Food Bowl - Quinoa | Can be moved | No | Highlighted |
| Llama Statue | Can be moved | No | Highlighted |
| Tumi (knife) | Can be moved | No | Highlighted |
| Silver Wawiki | Can be moved | No | Highlighted |
| Gold Wiwiki | Can be moved | No | Highlighted |

Interface Study:

| Place in App | Menu Item | On-Screen Image | Effect | Other Information Provided | Place in Area | Physical Interaction Type | Other Notes |
|---|---|---|---|---|---|---|---|
| Base | Choose objects | Home in mountains | Opens other options | Displays collectables | Entire | Move to areas | |
| Base - Activity Workspace | Activity select | White Table, Globe, mag preview | Displays Activity | Description on left | Center | N/A | "Select a single activity" |
| Base - | Activity | White box | N/A | N/A | Left | N/A | "Photograph Machu Picchu, Peru for a |

Sindelar 286

| Activity Workspace | | description | | | | | special edition of the National Geographic magazine." |
|---|---|---|---|---|---|---|---|
| Base - Activity Workspace | Arrows | Yellow arrows | Toggles Activities | N/A | Left | Lift Right Index + Push virtual button | |
| Base | Phone | Play button, More Info | Plays voicemail; brings up voice chat info | N/A | | Move Hand | |
| Base | Photo Review | Arrows, page numbers, current photos | Pulls up images | share and delete buckets | N/A | Move Hand | Back, remove, remove all |
| Camera | Viewfinder | Smaller view of the world | Enables photographs | Contains frame and visual aids | Entire view | Press Grasping button + Arm position | |
| Camera | Frame | Yellow box | Shows borders of photo | N/A | Center | Move head and body | Also affected by zoom and panorama |
| Camera | Zoom | Visual aid in Viewfinder | Frame size change | N/A | Center | Move Right Joystick | |
| Camera | Panorama | Visual aid in Viewfinder | Frame size change | N/A | Center | Press A button | |
| Camera | Take Photo | Visual aid in Viewfinder | Takes photo | "Photo saved" Preview of saved photo | Center | Press Right Trigger | Mimics regular camera trigger |
| Camera | Zoom (alternate) | Shows left controller | Frame size change | N/A | Center | Press Left grasping trigger | Mimics regular camera zoom |
| Options Menu | Options Select | Settings words | Select Setting | Controllers with buttons notes | Center | Press Options Button | "Pause", "National Geographic Explore VR" |
| Options Menu | Voice Chat | Voice Chat with a friend instructions and visual aid | | | | | |

Options Menu | Settings | Language, Audio, Subtitles, Narrator       back
Volume, Music Volume, Stick locomotion, Stick Rotation, Profile, Save Data

Options Menu | Credits | Movie-like fading in and out credits

| Location | Item | Visual | Function | Details | Position | Interaction | Drag/Other | Other Notes |
|---|---|---|---|---|---|---|---|---|
| Options Menu | Resume | "Resume" | Resumes game | N/A | Center | Press Right Trigger | Loading Screen | |
| | N/A | "Loading" + Tips | | Tips explain menu and other options | In between places in the app | N/A | | |
| Alignment Screen | N/A | Arrows and shoes icons in circle | Starts next place in app | N/A | Relative to where the user is | Walk to place in circle | Enters Antarctic through Nat Geo frame | |
| Play Mode | Choose position | Buttons and examples of positions | Shows position option | "Sit on Floor" and "Don't sit on floor" | Center | Lift Right Index + Push virtual button | Kayak would be elevated to hip height in standing mode. | Kayak Highlight |
| | Pickup Paddles | Hands and circles over paddles | Pickup Instructions | N/A | On handles | Both Grasping Buttons | | |
| Movement Target | Goal | White circle with yellow arrow | Shows where to go | N/A | Relative to where the user is | Press Left Joystick | Object Target | |
| | Place Item Here | Transparent Yellow silhouette | Shows where to place item | N/A | Relative to where the user is | Relative to task | | |
| Base - Photo Desk | Arrows | Yellow Arrows | Changes photos displayed | Number of pages with photos and current page | Right and Left | Move hand against arrow | | |
| Base - Photo Desk | Trash Bin | Red/White Trash icon with hole | Deletes photo | N/A | Left | Press and Release Grasping Button + Arm Movement | Drag photo to hole and drop it | Base - Photo Desk |
| | Facebook Bin | Facebook icon with hole | Shares photo to Facebook | N/A | Right | Press and Release Grasping Button + Arm Movement | Drag photo to hole and drop it | Base - Photo Desk |
| | Photos | Photos player took | Can grab and move | N/A | Center | Press and Release Grasping Button + Arm Movement | | |
| Base - Photo Desk | Share to Facebook | Photo and share options | Posts to Facebook | Privacy Settings and caption | Center | Press Right Trigger | | |
| Various Locations in MP | Barrier | Yellow circle with line through it | Prevents touch and access | N/A | Relative to where the user is | Appears with any engagement in certain areas | Machu Picchu - Entrance | |
| | Area Select | Yellow arrow and "Ancestor Workshop" | Takes you to area | Camera icons for # of activities | Relative to where the user is | Press Trigger Button | | |
| Machu Picchu - Entrance | Area Select | Yellow arrow and Ingenuity Group" | Takes you to area | Camera icons for # of activities | Relative to where the user is | Press Trigger Button | Machu Picchu - Entrance | |
| | Area Select | Yellow arrow and "House of the Guardian" | Takes you to area | Camera icons for # of activities | Relative to where the user is | Press Trigger Button | Machu Picchu - Entrance | |
| | Machu Picchu Map | Map with highlighted areas | | N/A | Relative to where the user is | N/A | | |
| Machu Picchu - Entrance | Corkboard of Hiram Bringham Photos | Actual Photos with captions | N/A | N/A | Relative to where the user is | N/A | "Hiram Bingham 1875-1956" _ "First Photograph - 07/24/1911" _ "Rediscovery of Machu Picchu" _ "Machu Picchu Expeditions" | Machu Picchu |
| Photo Assignment | Banner displaying session, box displaying details | | Starts or gives info on assignment | Options Menu | Left Palm | Open and look at left palm | May have photos, text, or "Start" button | |
| Machu Picchu | Photo Assignment - Options Menu | Yellow buttons and text | For Photoshoot | N/A | Left Palm | Open and look at left palm | "Skip Current Task" _ "Cancel Photoshoot" _ Continue Photoshoot" | Machu Picchu |
| | Photo Assignment - Optional Shots | Yellow buttons and text | Other Activities | Description varies by place, Yellow Arrows | Left Palm | Open and look at left palm + Press Right Trigger | "Skip Current Task" _ "Cancel Photoshoot" _ Continue Photoshoot" | Machu Picchu locations |
| | Repeat Activity | Camera Marker on Ground | Starts completed activity | N/A | Near activity | Press Left Joystick | | |
| Machu Picchu locations | Toggle digital overlays | Yellow eye icon | Toggles digital overlays | N/A | Near activity | Press Trigger Button | | |

Interaction Log:

| Touch Type | Camera Use | Interaction | Details | Other Notes |
|---|---|---|---|---|

**Base - Tutorial**

| Touch Type | Camera Use | Interaction | Details / Other Notes |
|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Hi I'm Natalie, your National Geographic Editor" |
| N/A | No | Voiceover/Caption | N: "Today you're headed out on an expedition and we'd like you to send us photographs of your journey." |
| N/A | No | Voiceover/Caption | N: "But first, let me show you how to move around." |
| N/A | No | Voiceover/Caption | N: "Look at your left hand to see controls." |
| N/A | No | Voiceover/Caption | N: Push the left joystick with your thumb, then aim your controller at where you want to go." |
| Press Left Joystick | No | Move | Jump to position highlighted in world |
| N/A | No | Voiceover/Caption | N: "When you're ready, release the joystick." |
| N/A | No | Voiceover/Caption | N: "Take your time to explore the base and move when you're ready." |
| Press Left Joystick | No | Move | Repeated many times to navigate through base. |
| Press Left Joystick | No | Move, | N: "Great. As a National Geographic explorer your photos have the potential to make people curious |

| Button | Yes/No | Action | Prompt | Notes |
|---|---|---|---|---|
| | | Voiceover/Caption | about the world we share. So, lets take your first National Geographic photo!" | |
| N/A | No | Voiceover/Caption | N: " To start, look down and pick up the camera using the highlighted button." | |
| Right Grasping Button | Yes | Pick up Camera | Hand must be aligned with virtual camera located on right side by belt area. | |
| N/A | Yes | Voiceover/Caption | N: "Take a peek through the viewfinder" | |
| Right Grasping Button | Yes | Looking through view finder | Must hold camera to face | |
| N/A | Yes | Voiceover/Caption | N: "Awesome. You can zoom in or out by rotating the lens." | |
| N/A | Yes | Voiceover/Caption | N: "Take a look through the viewfinder on the camera." | I dropped the camera. |
| Right Grasping Button | Yes | Looking through view finder | Must hold camera to face | |
| N/A | Yes | Voiceover/Caption | N: "Awesome. You can zoom in or out by rotating the lens." | |
| N/A | Yes | Voiceover/Caption | N: "Hold your left hand in front of the camera and grab the lens with the highlighted button" | This happened very quickly and I didn't notice it until recording these notes. I did not use zoom |
| Press Right Joystick | Yes | Adjust frame - Zoom | Continues tutorial | |
| N/A | Yes | Voiceover/Caption | N: "Perfect. Now, to take a picture, simply press the trigger with your index finger." | |
| Press Right Trigger Button | Yes | Take photo | Photo of base | |
| N/A | Yes | Voiceover/Caption | N: "Great picture! I'm glad we have a professional on board. That's all you need to know about the camera." | |
| N/A | No | Voiceover/Caption | N: "We're almost done. Let's go over the controls one more time in the options menu." | |
| N/A | No | Voiceover/Caption | N: "Open it by pressing the highlighted button." | |
| N/A | No | Voiceover/Caption | N: "We're almost done. Let's go over the controls one more time in the options menu." | Repeated because I wasn't following prompt. |

| | | | | |
|---|---|---|---|---|
| Options Button | No | Opens Options Menu | Highlighted button controller. | |
| N/A | No | Voiceover/Caption | N: "In the options menu, look at your hands to see the controls." | Displays controllers with buttons notes with the options menu. |
| Press Right Tigger Button | No | Select Option | Ends tutorial | |
| N/A | No | Voiceover/Caption | Okay, I think we've covered the basics. You're ready to set off. Pick a location and hit the explore button." | |
| N/A | No | Voiceover/Caption | N: "You can select different destinations and see their location on the globe." | |
| Lift Right Index + Push virtual button | No | Change Activity Option | Selected Antarctica | |
| Lift Right Index + Push virtual button | No | Pressed Explore Button | Began Antarctica Activity | Enter Through NatGeo mag frame |
| N/A Antarctic | No | Voiceover/Caption | N: "Bon voyage!" | |
| N/A | No | Voiceover/Caption | M: "Hey, up here! It's me, Mike! Good to see you're ready." | Speaks and waves from boat that is lowering kayak down |
| N/A | No | Voiceover/Caption | M: "After ten days cooped up aboard you must be keen to get going and to make the most of your time here on the Antarctic Peninsula." | |
| N/A | No | Voiceover/Caption | M: "The colony of Emperor penguins we've been studying seems to have moved, and you're here to find it." | |
| N/A | No | Voiceover/Caption | M: "As you search by kayak, I'll track your progress and stay in touch via your headset." | |
| N/A | No | Voiceover/Caption | M: "You never know what's going to happen out there an it's my job to stay aboard and keep you and the other explorers safe." | |
| N/A | No | Voiceover/Caption | M: "Remember, your kayak will be carried forward by the tide, so it should be easy going." | |
| N/A | No | Voiceover/Caption | M: "It's a bit misty out here on the open water, but it'll clear up as you head inland." | |
| N/A | No | Voiceover/Caption | M: "Okay, get in the kayak and off you go!" | |
| Lift Right Index + Push virtual button | No | Button | Chose "Sit on Floor" | Mostly stayed in kayaking posture. |
| N/A | Yes | Visual Highlight | Camera glows to show where it is in kayak. | |

| | | | | |
|---|---|---|---|---|
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of iceberg | Practice shot |
| N/A | Yes | Voiceover/Caption | M: "These icebergs are made of snow that fell thousands of years ago." | |
| N/A | Yes | Voiceover/Caption | M: "Up ahead you'll encounter the massive ice sheet they were once part of." | |
| N/A | Yes | Voiceover/Caption | M: "Keep an eye open for other wildlife and enjoy the scenery. I love it out here." | |
| N/A | No | Voiceover/Caption | M: "If you're feeling energetic, you can get busy with the paddle and steer." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of iceberg | |
| N/A | No | Voiceover/Caption | M: "Yeah, the ice sheet changes every single day. But recently, we've recorded more ice loss than ever before." | |
| N/A | No | Voiceover/Caption | M: "Don't forget to document your journey! Your photos will be a valuable addition to our research." | |
| N/A | No | Voiceover/Caption | M: "I'll tell you about the wildlife you encounter and the Antarctic environment as you go along." | |
| N/A | No | Voiceover/Caption | M: "These Antarctic Orcas hunt Weddell Seals and have been observed working co-operatively to wash the seals from safety of the sea ice." | In response to nearing seals. |
| N/A | No | Voiceover/Caption | M: "The penguins mainly feed on silver fish, which are about the size of your hand." | |
| N/A | No | Voiceover/Caption | M: "Okay, take it easy now, you're quite safe; the Orca is just checking out your kayak." | In response to nearing orcas. |
| N/A | No | Voiceover/Caption | M: "Hey, those are Emperor penguins, they are probably hunting for fish." | In response to nearing penguins. |
| N/A | No | Voiceover/Caption | M: "Perhaps you'll find the colony up ahead?" | |
| N/A | No | Voiceover/Caption | M: "Steady now, the strength of the current increases in this narrow passage. Just stay calm, you'll be okay." | Prepares user for speed change. |
| N/A | No | Voiceover/Caption | M: "These solitary mammals are called Minke whales and they can be hard to spot. They feed on swarms of krill which feast on the blooms of plankton living in a layer of freshwater melt from glaciers below." | |
| N/A | No | Voiceover/Caption | M: "So, it looks like you've only encountered a few hunting penguins, not the main colony." | |

| | | | |
|---|---|---|---|
| | | | ion |
| N/A | No | Voiceover/Capt M: "We're right. It must have moved." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "You'll have to continue your search from a field camp, located on top of the ice shelf." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "Just let the kayak glide up onto the sea ice and get out." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "See the established climbing route leading to the camp? Time to get your climbing gear out!" | |
| | | | ion |
| Press Both Grasping Buttons + Swing and Pull Arms | No | Climb Ice | Begin climbing towards field camp with ice pickaxes. |
| N/A | No | Voiceover/Capt M: "Alright, time to climb this ice shelf, and get to the field camp." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "From there you can continue to search from the penguin colony." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "Wow, look at that! It's a Minke whale and her young." | |
| | | | ion |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of iceberg |
| N/A | No | Voiceover/Capt M: "Minke whales are much smaller than most other whales. Adults only reach about twenty-five feet | |
| | | | ion |
| | | | long." |
| N/A | No | Voiceover/Capt M: "It's an ideal photo opportunity." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "Okay, from here you can continue climbing directly up to the next point, or to your left there is a | |
| | | | ion |
| | | | tougher route to explore." |
| N/A | No | Voiceover/Capt M: "This route is a real challenge; you can always go right to get on the direct route to the camp." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "Great climbing skills! You're going to need them to get all the way to the top." | |
| | | | ion |
| N/A | No | Voiceover/Capt M: "So, are you arms feeling like jelly yet? As you near the top you will encounter brittle ice."     I didn't | |
| | | | ion |
| | | | notice this dialogue. |
| N/A | No | Voiceover/Capt M: "Check that out - you've discovered some lost equipment. I think a team lost it in a storm last | |
| | | | ion |
| | | | season."        In response to photo |
| N/A | No | Voiceover/Capt M: "It looks like a crevasse in the ice opened up and swallowed it." | |
| | | | ion |

| | | | |
|---|---|---|---|
| Press Both Grasping Buttons + Swing and Pull Arms | No | Climb Ice | Begin climbing towards field camp with ice pickaxes. |
| N/A | No | Voiceover/Caption | M: "WOW! That was too close!"In response to ice breaking off. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of icebergs |
| N/A | No | Voiceover/Caption | M: "It's a spectacular view. You can see how big the fissure in the ice sheet is."   In response picture/view |
| N/A | No | Voiceover/Caption | M: "Eventually, a piece the size of Manhattan could break off and become a new iceberg." |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | M: "Awesome, you've made it to the top! I can just about see you from the ship. Give me a wave!" | |
| N/A | No | Voiceover/Caption | M: "Awesome, you've made it to the top! I can just about see you from the ship. Give me a wave!" | |
| N/A | No | Voiceover/Caption | M: "Okay, there's a storm closing in fast, and night is falling. You need to head to the field camp as soon as possible." | |
| Press Left Joystick | No | Move | Repeated several times to move to target. | |
| N/A | No | Voiceover/Caption | M: "Woah, there goes your wind break!" | Time has seemingly passed and a storm has blown in, causing low visibility. |
| N/A | No | Voiceover/Caption | M: "You better attach the loose ropes, otherwise the tent will blow away in these winds!" | |
| N/A | No | Voiceover/Caption | M: "Yup, that will keep it secure. Maybe check out the wall of boxes that blew over too. They're behind the tent." | |
| Press Left Joystick | No | Move | Repeated several times to move to target. | |
| Press Both Grasping Buttons + Move arms and body | No | Complete task | Stack Boxes | |
| N/A | No | Voiceover/Caption | M: "Good job, you'll be much warmer and safer tonight!" | |
| N/A | No | Voiceover/Caption | M: "Tent secured, good work. Now get in!" | |
| Press Left Joystick | No | Move | Repeated several times to move to target. | |
| Press Right Grasping Button + Move arm | No | Complete task | Open tent zipper | |
| N/A | No | Voiceover/Caption | M: "No one's been here since last season. See if that lamp is fueled up and ready to go." | |
| N/A | No | Voiceover/Caption | M: "We still rely on kerosene out here, as batteries simply don't hold their charge in these temperatures." | |
| Reach hand out | No | Complete task | Turn on kerosene lamp by touching it. | |
| N/A | No | Voiceover/Caption | M: "There doesn't seem to be a sleeping bag here… without one you will get hypothermia." | |
| Press Right Grasping Button + Move arm | No | Complete task | Open tent zipper | |
| N/A | No | Voiceover/Caption | M: "The supply boxes are nearby and marked by flags. Try not | Visibility is low from windy snow storm |

| | | | | |
|---|---|---|---|---|
| | | tion | to get lost. " | |
| Press Left Joystick | No | Move | Repeated several times to move to target. | |
| N/A | No | Voiceover/Cap tion | M: "Search the boxes to find a sleeping bag." | Visibility is low from windy snow storm |
| N/A | No | Voiceover/Cap tion | M: "Also see if you can find some eye protection from the flying now and ice." | Visibility is low from windy snow storm |
| Press Right Grasping Button + Move arm | No | Complete task | Open boxes | |
| Press Right Grasping Button + Move arm | No | Complete task | Picked up item (sleeping bag) looking for the sleeping bag | I picked up the sleeping bag but the game didn't recognize it because I wasn't wearing my goggles |
| N/A | No | Voiceover/Cap tion | M: "You might stand a better chance of finding the tent if you could see better." | The sleeping bag is referred to as a tent here. I wasn't sure how to tell if I found the right object |
| Press Right Grasping Button + Move arm | No | Complete task | Picked up item (Personal Locater Beam) looking for the sleeping bag | Still holding sleeping bag |
| Release Right Grasping Button + Move arm | No | Complete task | Put items back in boxes | I guessed that the sleeping bag wouldn't count until I found the goggles |
| Press Right Grasping Button + Move arm | No | Complete task | Picked up item (Personal Locater Beam) looking for the sleeping bag | Still holding sleeping bag |
| Press Right Grasping Button + Move arm | No | Complete task | Open boxes | |
| Press Right Grasping Button + Move arm | No | Complete task | Picked up item (Goggles) looking for the sleeping bag | Still holding sleeping bag |
| Press Right Grasping Button + Move arm | No | Complete task | Open box | |
| Press Right Grasping Button + Move arm | No | Complete task | Picked up item (sleeping bag) looking for the sleeping bag | I picked up the sleeping bag but the game didn't recognize it because I wasn't wearing my goggles |
| N/A | No | Voiceover/Cap | M: "Right, now take that back to the tent." | The sleeping bag is referred to as a tent |

| | | | | |
|---|---|---|---|---|
| tion | | | | here. I wasn't sure how to tell if I found the right object |
| Press Left Joystick | No | Move | Repeated several times to move to target. | |
| Press Right Grasping Button + Move arm | No | Complete task | Open tent zipper | |
| N/A | No | Voiceover/Caption | M: "You'll be safe now; the sleeping bag and tent will keep you alive." | Strong wording |
| N/A | No | Voiceover/Caption | M: "Turn off the lantern and try to get some sleep." | |
| Press Right Grasping Button + Move arm | No | Complete task | Turn off kerosene lamp by touching it. | Accidently picked it up and knocked it over trying to interact with it. |
| N/A | No | Wait | Seconds in darkness as night passes | |
| N/A | No | Voiceover/Caption | M: "Hey, you're awake. The storm has passed so you can continue searching for the colony." | |
| Press Right Grasping Button + Move arm | No | Complete task | Open tent zipper | |
| Press Left Joystick | No | Move | Repeated several times to move down path | |
| N/A | No | Voiceover/Caption | M: "That's the colony! Amazing, you found it!" | |
| N/A | No | Voiceover/Caption | M: "Take a photo to document your discovery!" | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photos of colony | Repeated many times |
| N/A | No | Voiceover/Caption | M: "They probably relocated here to be closer to their source of food." | |
| N/A | No | Voiceover/Caption | M: "At this time of year these Emperor Penguins will be looking for their lifelong mates after spending months apart." | |
| N/A | No | Voiceover/Caption | M: "There are some flares in the supplies you can use to show the pilot your position." | I wanted to keep taking photos so I did not go do this |
| N/A | No | Voiceover/Caption | M: "No need for a flare as the pilot has spotted you. Sit tight and she will land nearby. | |
| N/A | No | Voiceover/Caption | M: "The pilot has confirmed your position. Sit tight and she will land nearby." | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | M: "Okay, get into the helicopter and we'll fly up back to the ship. Great job, explorer!" | Feeling rushed |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photos of colony | Repeated many times |
| N/A | No | Voiceover/Caption | M: "Okay, get into the helicopter and we'll fly up back to the ship. Great job, explorer!" | Feeling rushed |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photos of colony | Repeated many times |
| Press Left Joystick Base | No | Move | Repeated several times to move to target. | |
| N/A | No | Voiceover/Caption | N: "Wow! Amazing work finding the Emperor Penguin colony!" | |
| N/A | No | Item Added | Whale decoration on wall | Highlighted yellow at first |
| N/A | No | Voiceover/Caption | N: "Your discovery will improve our understanding of these wonderful birds." | |
| N/A | No | Voiceover/Caption | N: "Thanks for completing a photo assignment." | |
| N/A | No | Voiceover/Caption | N: "Look around the base. National Geographic editors seemed to really like your photo!" | |
| N/A | No | Voiceover/Caption | N: "Take a look at the photos you took over at the Photo Desk." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | |
| N/A | No | Voiceover/Caption | N: "You can drag your favorite photos to the frames on the wall. Give it a try!" | |
| Press and Release Right Grasping and Trigger Button | No | Grab photo | Penguin photo to wall | Repeated many times |
| N/A | No | Voiceover/Caption | N: "That looks great!" | |
| N/A | No | Voiceover/Caption | N: "You can also share your best shots on Facebook!" | |
| N/A | No | Voiceover/Caption | N: "Why not venture out again and try some of our optional photo assignments?" | |
| N/A | No | Voiceover/Caption | N: "You can learn about them when you select an activity." | |

| | | | | |
|---|---|---|---|---|
| Press Right Grasping Button + Move arm | No | Pickup phone | Phone is making vibration sound | |
| Move hand to Play button | No | Voiceover/Caption | N:"Don't forget you can voice chat with a friend while you're exploring. Simply start a party from the Oculus Menu." | Plays from phone. |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to Activity Workspace |
| Lift Right Index + Push virtual button | No | Change Activity Option | Selected Machu Picchu | |
| Lift Right Index + Push virtual button | No | Pressed Explore Button | Began Machu Picchu Activity | Enter Through NatGeo mag frame |
| N/A Machu Picchu | No | Voiceover/Caption | N: "Enjoy your journey!" | |
| N/A | No | Voiceover/Caption | N: "Welcome to Machu Picchu, Peru. Feel free to look around." | |
| N/A | No | Voiceover/Caption | N: "When you're ready, head to the yellow marker to learn more about what you can do here." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to Activity Workspace |
| N/A | No | Voiceover/Caption | N: "Meet our local expert, José! Can you give us an introduction?" | |
| N/A | No | Voiceover/Caption | J: "¡Hola!, nice to meet you! Bienvenido a Machu Picchu, an Inca royal estate built around the year 1450 and abandoned mysteriously 80 years later." | |
| N/A | No | Voiceover/Caption | N: "Machu Picchu's existence was largely unknown until Yale University professor Hiram Bringham took an expedition through Peru and re-discovered it in 1911." | No mention of any Indigenous groups living nearby and knowing of this place, or the looting th |
| N/A | No | Voiceover/Caption | N: "He took a lot of photos; some of them were published in National Geographic magazine." | |
| N/A | No | Voiceover/Caption | N: "Today we'll also be taking photos for the magazine, including a very special cover shot!" | |
| N/A | No | Voiceover/Caption | N: "Go ahead and explore the site. I've tagged the areas we could photograph for the magazine. Good luck!" | |
| N/A | No | Voiceover/Caption | J: "Si, good luck and have fun!" | |
| Press Right Trigger Button | No | Select Option | Inca Home | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "This is one of Machu Picchu's many 'gated communities.'" | |
| N/A | No | Voiceover/Caption | N: "We think these compounds, which are all over Machu Picchu, are where the elite families lived." | |
| N/A | No | Voiceover/Caption | N: "This is the perfect location to take photos for the 'Inca Homes' article, which talks about Inca homes from the inside and outside." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to Activity Workspace |
| N/A | No | Voiceover/Caption | N: "Here you can start a photo assignment." | |
| N/A | No | Voiceover/Caption | N: "To start this photo session, look at the palm of your left hand. See the interface?" | |
| N/A | No | Voiceover/Caption | N: "In this session you'll travel back in time with the help of a digital reconstruction to see how the Inca used to live." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Start" | |
| N/A | No | Voiceover/Caption | N: "Let's take a peek inside daily Inca life." | |
| N/A | No | Voiceover/Caption | N: "We think the building you're standing next to was the house of one of Machu Picchu 's upper-class families." | |
| N/A | No | Voiceover/Caption | N: "Let's get a shot of the exterior first." | |
| N/A | No | Voiceover/Caption | N: "I uploaded a Bingham photo to your interface. Can you match it?" | |
| Looks at palm of left hand | No | Photo Assignment Interface | "Replicate the outlined part of Bingham's photo." A Bringham photo. | |
| N/A | No | Voiceover/Caption | N: "When Bringham found this house, someone was using it! They had a make-shift roof." | Roof not featured in photo |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to Activity Workspace |
| Look at palm of left hand - Options | No | Photo Assignment | Continue Photoshoot | |

| Button | | Interface | | |
|---|---|---|---|---|
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to Activity Workspace |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home | |
| N/A | No | Voiceover/Caption | N: "Alright, let's head inside." | |
| N/A | No | Voiceover/Caption | J: "Hey, Natalie… You remember the sketch I sent you?" | |
| N/A | No | Voiceover/Caption | N: "Oh, I almost forgot! Sorry, uploading it now… Can we get a shot like this, too?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Get a shot of the tree from inside the house." Shows sketch. | |
| N/A | No | Voiceover/Caption | J: "I love this view. Might be nice for the article." | |
| N/A | No | Voiceover/Caption | N: "Definitely! Good idea, José." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home | |
| Look at palm of left hand | No | Photo Assignment Interface | Describes photo assignment. Shows sketch. | review assignment |
| Press Left Joystick | No | Move | Jump to position highlighted in world | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home | |
| N/A | No | Voiceover/Caption | N: "Don't forget you can check out the interface to see which photo to take next!" | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home | fits assignment |
| N/A | No | Voiceover/Caption | N: "Nice one." | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Ready to travel back to the 15th century with a digital reconstruction? Please outline where it goes." | |
| Look at palm of left hand | No | Photo Assignment Interface | Shows trace assignment. Shows graphic. | |
| Press Right Grasping + Release Trigger Button | No | Slider | Trace where object goes | |
| N/A | No | Voiceover/Caption | N: "Thanks again, José, for helping the graphics team with the historical details." | |
| N/A | No | Voiceover/Caption | J: "¡No hay problema!" | |
| N/A | No | Voiceover/Caption | N: "Wow, look at that! Amazing." | |
| N/A | No | Voiceover/Caption | J: "Si, they did a spectacular job. It feels like the family could just walk in." | |
| N/A | No | Voiceover/Caption | N: "Shall we start with the kitchen?" | |
| N/A | No | Voiceover/Caption | N: "Let's move the items around to get an image like the sketch I just sent over." | |
| Look at palm of left hand | No | Photo Assignment Interface | Shows placement assignment. Shows graphic. | |
| N/A | No | Voiceover/Caption | N: "We want the pot on the stove, with the food in front… but feel free to give it your own spin." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | |
| Press and Release Left Grasping Button | No | Move Object | Pot to Stove | |
| N/A | No | Voiceover/Caption | N: "They'd use this cooking pot to make things like quinoa porridge, a staple of the Inca diet." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home | Didn't realize I needed to move more items |
| N/A | No | Voiceover/Caption | N: "Please arrange highlighted items on the mat in front of the stove before taking the photo." | |
| Look at palm of | No | Photo | Shows placement assignment. Shows graphic. | |

| left hand | | Assignment Interface | |
|---|---|---|---|
| Press and Release Left Grasping Button | No | Move Object | Potatoes in front of stove |
| N/A | No | Voiceover/Caption | J: "Maize, potatoes and quinoa… That's what I grew up eating!" |
| Press and Release Left Grasping Button | No | Move Object | Maize in front of stove |
| Press and Release Left Grasping Button | No | Move Object | Quinoa in front of stove |
| N/A | No | Voiceover/Caption | N: "We also found traces of it in the remains of the regular people buried around the site." |
| N/A | No | Voiceover/Caption | N: "If you're happy with the way it looks, you can take the shot." |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home |
| N/A | No | Voiceover/Caption | N: "Great work!" |
| N/A | No | Voiceover/Caption | N: "There are some awesome textiles in here. Let's get a photo or two. Whichever you like." |
| N/A | No | Voiceover/Caption | N: "I've read that, to the Inca, some textiles were more valuable than gold." |
| N/A | No | Voiceover/Caption | N: "I guess those were only for the royal family." |
| N/A | No | Voiceover/Caption | J: "Claro. Some believe the king would only wear his clothing for one day. Then it would be burned." |
| N/A | No | Voiceover/Caption | N: "And I thought I burned through clothing quickly." |
| Press Left Joystick | No | Move | Jump to position in world |
| Press Right Grasping and Trigger Button | Yes | Take photo | Tapestry |
| N/A | No | Voiceover/Caption | N: "Excellent shot." |

| | | | |
|---|---|---|---|
| | | | ion |
| N/A | No | Voiceover/Capt ion | N: "I see some skulls. They were an important part of daily life, right José?" |
| N/A | No | Voiceover/Capt ion | J: "Absolutamente. When I was growing up it was still normal to have a grandparent or great-grandparent's skull in the living room." |
| N/A | No | Voiceover/Capt ion | N: "So Inca culture lives on. Let's get a shot of those skulls in the niche." |
| N/A | No | Voiceover/Capt ion | J: "We were told these family skulls were watching over our house." |
| N/A | No | Voiceover/Capt ion | J: "I was always on my best behavior when one was watching me." |
| N/A | No | Voiceover/Capt ion | N: "Yeah, I would be, too!" |
| Press Left Joystick | No | Move | Jump to position in world |
| Press Right Grasping and Trigger Button | Yes | Take photo | Skulls and flowers ion niche |
| N/A | No | Voiceover/Capt ion | N: "Good shot." |
| N/A | No | Voiceover/Capt ion | N: "Let's also get the offerings below the ancestor skulls." |
| Press Left Joystick | No | Move | Jump to position in world |
| N/A | No | Voiceover/Capt ion | N: "We go into offerings more in the 'Ancestor Worship' article, but it's good to show they were part of daily life at home, too." |
| Press Left Joystick | No | Move | Jump to position in world |
| Press Right Grasping and Trigger Button | Yes | Take photo | Skulls and flowers ion niche |
| N/A | No | Voiceover/Capt ion | N: "Great, thanks!" |
| N/A | No | Voiceover/Capt ion | N: "Okay, the 'Inca Homes' article also talks about how the Inca might have slept." |
| N/A | No | Voiceover/Capt ion | N: "So we definitely want a photo of the sleeping area, if you can get that." |
| N/A | No | Voiceover/Capt | N: "The Inca made good use of their space, with the same |

| | | | |
|---|---|---|---|
| | | ion | room having many different functions." | |
| Press Left Joystick | No | Move | Jump to position in world | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Corner with blankets and pillows | |
| N/A | No | Voiceover/Caption | N: "Great photo. Wanna take any more photos in here? Head outside when you're done." | |
| Press Left Joystick | No | Move | Jump to position in world | Went outside |

| | | | |
|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Let's get one last shot from the outside, with the reconstruction." |
| N/A | No | Voiceover/Caption | N: "Remember that Bringham photo from earlier? I sent it again, if you can copy that angle." |
| N/A | No | Voiceover/Caption | J: "So the article will show this home in the 1400s, 1911 and today, side by side?" |
| N/A | No | Voiceover/Caption | N: "Yep!" |
| N/A | No | Voiceover/Caption | J: "Buenasa. That will be cool to see." |
| Press Left Joystick | No | Move | Jump to position in world |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo of Inca home |
| N/A | No | Voiceover/Caption | N: "Fantastic, that's a good one." |
| N/A | No | Voiceover/Caption | N: "That wraps up the section on Inca interiors." |
| N/A | No | Voiceover/Caption | N: "your photos will give our readers a good look at Inca life at home. Ready for the next part?." |
| Press Left Joystick | No | Move | Jump to position in world |
| N/A | No | Voiceover/Caption | N: "For this part of the article we'll use the buildings in this compound to explore what makes Inca architecture unique." |
| N/A | No | Voiceover/Caption | N: "Look at your left hand. Can you spot the Interface?" |
| Look at palm of left hand | No | Photo Assignment Interface | "Start" |
| N/A | No | Voiceover/Caption | N: "Alright, let's talk Inca architecture!" |
| N/A | No | Voiceover/Caption | N: "Your photos will help us show things like |

Realized that this is how I could repeat this activity.

| Press Right Trigger Button | No | Toggle Overlay | Inca Architecture |
|---|---|---|---|
| Press Right Trigger Button | No | Toggle Overlay | Inca Home |
| Look at palm of left hand | No | Photo Assignment Interface | Shows optional photos |
| Look at palm of left hand + Move right hand | No | Photo Assignment Interface | Scroll through optional photos |
| Press Right Grasping and Trigger Button | Yes | Take photo | Attempt Condor over Temple of the Condor |
| Press Right Trigger Button | No | Select Option | Ancestor Worship |
| N/A | No | Voiceover/Caption | J: "Welcome to the Sacred Plaza." |
| N/A | No | Voiceover/Caption | J: "We think this was the spiritual heart of Machu Picchu." |
| N/A | No | Voiceover/Caption | N: "The perfect spot to get photos for our 'Ancestor Worship' article, then!" |
| Press Left Joystick | No | Move | Jump to marker in world |
| N/A | No | Voiceover/Caption | N: "For this section of the ancestor worship article we'll have a photo session with a digital reconstruction of a mummified Inca royal." |
| N/A | No | Voiceover/Caption | N: "To start this photo session, look at the palm of your left hand. See the interface?" |
| Look at palm of left hand | No | Photo Assignment Interface | "In this session we'll use a digital reconstruction of a mummified royal Inca for the article on ancestor worship." |
| Look at palm of left hand + Right hand movement | No | Photo Assignment Interface | Start |
| N/A | No | Voiceover/Caption | N: "Okay, let's get started! Before we get to the mummies, we can take a look at the Principal Temple itself." |

| | | | | | |
|---|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "I was thinking a side-by-side comparison of how it looks today and when Bringham found it in 1911." | |
| N/A | No | Voiceover/Caption | N: "Check your interface for his photo." | |
| Look at palm of left hand + Right hand movement | No | Photo Assignment Interface | "Copy Bingham's photo of the Principal Temple." [photo] | |
| N/A | No | Voiceover/Caption | N: "Try to take the photo from the same place Bringham did, to match it as exactly as possible." | |
| Press Left Joystick | No | Move | Jump to place in world | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Copy Bingham's Photo | Fail - Wrong Angle. Repeated Several times. |
| Press Left Joystick | No | Move | Jump to place in world | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Copy Bingham's Photo | |
| N/A | No | Voiceover/Caption | N: "Yeah, really great. This comparison shot might be the centerpiece of the article." | |
| N/A | No | Voiceover/Caption | N: "Look at that stonework. Some of the finest in Machu Picchu, right José?" | |
| N/A | No | Voiceover/Caption | J: "Claro, they spent a lot of time on this building, so we know it was important." | |
| N/A | No | Voiceover/Caption | J: "I found an old sketch of a stone in one of these walls with a lot of precisely cut angles." | |
| N/A | No | Voiceover/Caption | J: "I'd love to show it, if we can find it and snap a photo." | |
| Look at palm of left hand + Right hand movement | No | Photo Assignment Interface | "Find this photo on one of the Principle Temple walls and photograph it." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Copy sketch | |
| N/A | No | Voiceover/Caption | N: "Yep, one hundred percent. I think we're ready to meet the mummies." | |
| N/A | No | Voiceover/Caption | N: "The graphics team sent a digital reconstruction of | |

| | | | | |
|---|---|---|---|---|
| | | ion | how we think a mummy ceremony looked in the 15th century." | |
| N/A | No | Voiceover/Caption | N: "Can you outline where it should go?" | |
| Look at palm of left hand | No | Photo Assignment Interface | Shows trace assignment. Shows graphic. | |
| Press Right Grasping + Release Trigger Button | No | Slider | Trace where object goes | |
| N/A | No | Voiceover/Caption | N: "Okay, let's see what the team prepared!" | |
| N/A | No | Voiceover/Caption | J: "¡A su! So realistic..." | |
| N/A | No | Voiceover/Caption | N: "Right? This mummy looks like he was important." | |
| N/A | No | Voiceover/Caption | J: "Claro, this is a royal mummy. The Inca had a lot of respect for their royal mummies." | |
| N/A | No | Voiceover/Caption | J: "They would even ask them for advise, or to make decisions." | |
| N/A | No | Voiceover/Caption | N: "I sent over a list of a few things here it'd be great to get photos of. Start wherever you like." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Make close-ups of the following: The mummy's face. The mummy's bracelets. The offerings at the mummy's feet." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Offerings at mummy's feet | |
| N/A | No | Voiceover/Caption | J: "For the Inca, the mummies were still alive in a way." | |
| N/A | No | Voiceover/Caption | J: "They would even ask them for advise or to make a decisions." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Mummy's bracelets | |
| N/A | No | Voiceover/Caption | N: "Don't forget you can check the interface to see which | |

| Input | | Type | Text | Notes |
|---|---|---|---|---|
| | | ...ion | photo to take next!" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Make close-ups of the following: The mummy's face. The mummy's bracelets. The offerings at the mummy's feet." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Mummy's face | |
| N/A | No | Voiceover/Caption | N: "He still looks regal, even in death." | |
| N/A | No | Voiceover/Caption | N: "Hmm, some cool offerings I saw the graphics team working on are missing." | |
| N/A | No | Voiceover/Caption | N: "If I send over wireframes of what they look like, think we can find them and put them with the others?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Find the following items and add them to the offerings: The llama statue. The tumi (knife)." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Pick Up Object | Pick up tumi from corner | |
| N/A | No | Voiceover/Caption | N: "Ah, there's the ceremonial knife. I think it's called a tumi?" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place tumi with offerings | |
| N/A | No | Voiceover/Caption | J: "Sí, that's the Quenchuan word for any sharp tool." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Pick Up Object | Pick up llama (statue) from basket | |
| N/A | No | Voiceover/Caption | N: "Aw, a miniature llama. How cute!" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place llama with offerings | |
| N/A | No | Voiceover/Caption | J: "Llamas were really important to the Inca. Wheels didn't work well in the rocky Andes, but llamas did." | |
| N/A | No | Voiceover/Caption | N: "All photo-ready now. Maybe we could switch it up | |

| | | ion | with a low-angel close-up?" | |
|---|---|---|---|---|
| Look at palm of left hand | No | Photo Assignment Interface | "Take a low-angle shoot of the entire mummy with the offerings at his feet." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Mummy at low angle | |
| N/A | No | Voiceover/Caption | N: "Awesome, I love it!" | |
| N/A | No | Voiceover/Caption | N: "I found a photo Bringham took of a Peruvian man standing in the same spot as our mummy. Can you match it?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Copy Bingham's photo of the back wall of the Principal Temple." [photo] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Match Bringham Photo | |
| N/A | No | Voiceover/Caption | N: "Incredible! More than a hundred years since that man stood here, and the building looks just the same." | |
| N/A | No | Voiceover/Caption | N: "We've also got a reconstruction of a blanket of offerings to a place in front of our mummy." | |
| N/A | No | Voiceover/Caption | N: "Can you outline where it should go?" | |
| Press Right Grasping + Release Trigger Button | No | Slider | Trace where object goes | |
| N/A | No | Voiceover/Caption | J: "Buenaso! The usual Inca offerings were food, beer, textiles and jewelry." | |
| N/A | No | Voiceover/Caption | J: "During the ceremony, the Inca often poured sacred corn beer into that golden bowl, for the mummy." | |
| N/A | No | Voiceover/Caption | N: "Oh right, I have an illustration of that; I'll share it." | |
| N/A | No | Voiceover/Caption | N: "Let's get another picture of the mummy with the offering blanket in front. Like in the illustration, maybe?" | |

| | | | | |
|---|---|---|---|---|
| Look at palm of left hand | No | Photo Assignment Interface | "Take a picture of the mummy with the blanket with the offerings in the foreground." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Match Sketch | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Great work!" | |
| N/A | No | Voiceover/Caption | N: "Let's take one last photo of everything together." | |
| N/A | No | Voiceover/Caption | J: "Can I suggest something?" | |
| N/A | No | Voiceover/Caption | J: "On the hill behind the Principal Temple, three's another temple we think was used to track the sun." | |
| N/A | No | Voiceover/Caption | J: "The Inca believed royalty were direct descendants of the sun." | |
| N/A | No | Voiceover/Caption | N: "Good one, José. Let's get a photo of the two together. I'll send you  sketch." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Get a shot of the mummy ceremony aligned under the hill behind the temple." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Get a shot of the mummy ceremony aligned under the hill behind the temple." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Get a shot of the mummy ceremony aligned under the hill behind the temple." [sketch] | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Match Sketch | |
| N/A | No | Voiceover/Caption | N: "Niiice! All the elements of Inca ancestors worship in one photo. A great final shot." | |
| N/A | No | Voiceover/Caption | N: "Let's move on to something else." | |

| | | | | |
|---|---|---|---|---|
| | | ion | | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| N/A | No | Voiceover/Caption | N: "Have you heard of wawkis? This section of the article is all about these special statues." | |
| N/A | No | Voiceover/Caption | N: "Look at the palm of your hand. Can you spot the Interface?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Have you ever heard of 'wawkis'? We tell the reader all about them in this section of the article." | |
| Look at palm of left hand + Right hand movement | No | Photo Assignment Interface | Start | |
| N/A | No | Voiceover/Caption | N: "We'll use the building you're standing in now to get some photos of wawkis reconstructions." | |
| N/A | No | Voiceover/Caption | J: "Ahh, sí, the brothers - that's what wawkis means." | |
| N/A | No | Voiceover/Caption | J: "They were often statues representing specific Inca people, real or mythical, living or dead." | |
| N/A | No | Voiceover/Caption | N: "Cool. We've got a few digital reconstruction of these, um, brothers." | |
| N/A | No | Voiceover/Caption | N: "Where should we put the first? One of these niches?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Iindicate where the wawkis should appear. Point at the icon. Press the trigger." | |
| Press Right Trigger Button | No | Toggle Overlay | Populates wawkis in location | |
| N/A | No | Voiceover/Caption | N: "Wow, look at that detail!" | |
| N/A | No | Voiceover/Caption | N: "Let's take a photo of the wawki framed by the niche around it." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right | Yes | Take photo | Photo assignment - Wawki in niche | |

| Grasping and Trigger Button | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Cool photo. And it might be interesting to also try double-framing the wawki..." | |
| N/A | No | Voiceover/Caption | N: "I sketched out an idea. What do you think?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a photo of the wawki double-framed." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Wawki double framed | |
| N/A | No | Voiceover/Caption | N: "That's really cool, too! It's gonna be hard to choose." | |
| N/A | No | Voiceover/Caption | J: "We think golden wawkis represented the sapa - the kings - or even the sun god Inti himself." | |
| N/A | No | Voiceover/Caption | J: "And that priests would speak to the king or to Inti through the statue." | |
| N/A | No | Voiceover/Caption | N: "Great info for the article! Let's get a shot of the wawki with the sun above it." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Wawki with sun | |
| N/A | No | Voiceover/Caption | N: "Loving the symbolism. José, any more golden ideas?" | |
| N/A | No | Voiceover/Caption | J: "Ummm… Maybe a similar shot in silver? Silver was linked to the moon goddess Mama Quilla." | |
| N/A | No | Voiceover/Caption | N: "Interesting… but hard to do without the moon." | |
| N/A | No | Voiceover/Caption | J: "Right… oh! There's a Temple of the Moon on Mount Picchu! We can't see it from here, but…" | |

| Input | | Action | Description | Notes |
| --- | --- | --- | --- | --- |
| N/A | No | Voiceover/Caption | N: "Yeah, that's a nice tie-in! Let's get a shot with the mountain." | |
| N/A | No | Voiceover/Caption | N: "But first we'll need a silver wawki. Shall we try it in that niche over there?" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Trigger Button | No | Toggle Overlay | Populates wawkis in location | |
| N/A | No | Voiceover/Caption | N: "Yeah, that one. Although, hmmm… The wawki looks great, but it's not really lining up with Huayna Picchu." | |
| N/A | No | Voiceover/Caption | N: "Let's try another niche right under the mountain." | |
| Press Right Grasping Button | No | Pick Up Object | Pick up silver wawki | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place wawki in different niche | |
| N/A | No | Voiceover/Caption | N: "Yeah, that could work!" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Wawki with Huayna Picchu | |
| N/A | No | Voiceover/Caption | N: "Yep, that works nicely indeed." | |
| N/A | No | Voiceover/Caption | N: "Let's put the two statues in the same niche for a close-up." | |
| N/A | No | Voiceover/Caption | J: "If you get the blue sky in the back, it would really make the metal shine." | |
| N/A | No | Voiceover/Caption | N: "I just sent you a sketch. Like that?" | |
| Look at palm of left | No | Photo | "Take a photo of the gold and silver wawkis in one niche, | |

| | | | | |
|---|---|---|---|---|
| hand | | Assignment Interface | with the sky." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Pick Up Object | Pick up silver wawki | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| N/A | No | Voiceover/Caption | J: "The Inca also used to move the wawkis around - it was much more practical to move these between festivals and battlefields than fragile mummies." | |
| Press Right Grasping Button | No | Place Object | Place wawki in different niche | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Pick Up Object | Pick up golden waki | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place golden wawki in niche | |
| N/A | No | Voiceover/Caption | N: "Okay, that should do it. Go ahead and take the shot." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Silver and Golden wawkis together | |
| N/A | No | Voiceover/Caption | J: "Wow, look at those colors! That'll really pop off the page." | |
| N/A | No | Voiceover/Caption | J: "The king and queen together! In a ceremony or procession, these two statues might have been followed by a parade of ancestors going back in time." | |
| N/A | No | Voiceover/Caption | N: "Oh, José just gave me an idea! Our digital team also made a bronze wawki." | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Why don't we put three of those in the empty niches for our final shot? Can you set them up?" | |
| Press Right Trigger Button | No | Toggle Overlay | Populates bronze wawki in location | |
| Press Right Trigger Button | No | Toggle Overlay | Populates bronze wawki in location | |
| Press Right Trigger Button | No | Toggle Overlay | Populates bronze wawki in location | |
| N/A | No | Voiceover/Caption | N: "Great! Now you can move the original wawkis to the empty niches left over." | |
| Press Right Grasping Button | No | Pick Up Object | Pick up silver wawki | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place silver wawki in different niche | |
| N/A | No | Voiceover/Caption | N: "Yeah, that looks great!" | |
| Press Right Grasping Button | No | Pick Up Object | Pick up golden wawki | |

| | | | | |
|---|---|---|---|---|
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping Button | No | Place Object | Place golden wawki in different niche | |
| N/A | No | Voiceover/Caption | N: "Yep, perfect." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| N/A | No | Voiceover/Caption | N: "All ready for the final wawki photo! Try not to get too much sky or floor in the shot. Maybe a panorama?" | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - All wawkis together | I do not take a panorama as it requests |
| N/A | No | Voiceover/Caption | N: "Yeah, just like that! Great photo." | |
| N/A | No | Voiceover/Caption | N: "Awesome, that wraps up our wawki photo session, these shots are real eye-catchers!" | |
| N/A | No | Voiceover/Caption | N: "Nice travelling back the [sic] Inca ancestor timeline with you." | |
| Press Right Trigger Button | No | Toggle Overlay | Populates/Depopulates all wawkis | Repeated |
| N/A | No | Voiceover/Caption | N: "Ready to talk beer?" | |
| N/A | No | Voiceover/Caption | N: "In this section we'll dive into how beer played a role in Inca religion and ancestor worship." | |
| N/A | No | Voiceover/Caption | N: "Look at the palm of your left hand. See the interface?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Ready to talk beer? In this section we'll dive into how beer played a role in Inca religion and ancestor worship." | |
| N/A | No | Voiceover/Caption | N: "Okay let's talk beer! We'll do this photo shoot at the Temple of the Three Windows." | |
| N/A | No | Voiceover/Caption | N: "This isn't the same kind of beer we sampled in Cuzco, though, Natalie." | |
| N/A | No | Voiceover/Caption | J: "This is a sacred corn beer, called chicha." | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Ahh, yeah, chicha. That's right. Well, we've got a digital recreation of a chicha offering." | |
| N/A | No | Voiceover/Caption | N: "One of the most common types of offerings the Inca made to their ancestors, I've been told." | |
| N/A | No | Voiceover/Caption | N: "Where should we place it?" | |
| Press Right Grasping + Release Trigger Button | No | Slider | Trace where object goes | |
| N/A | No | Voiceover/Caption | J: "The chicha was made from the corn they grew on the terraces around here." | |
| N/A | No | Voiceover/Caption | J: "They'd chew up the corn and spit it out into a big jar, and then let it turn into alcohol." | |
| N/A | No | Voiceover/Caption | N: "Interesting! I've read about similar fermentation processes in Japan and Brazil." | |
| N/A | No | Voiceover/Caption | N: "We definitely need to get some shot s of that digital chicha jug and the pretty purple South American corn." | |
| N/A | No | Voiceover/Caption | N: "Go ahead and pick your angles." | |
| N/A | No | Voiceover/Caption | N: "Juist make sure to feature the Temple of the Three Windows and/or the chicha artifacts." | |
| N/A | No | Voiceover/Caption | J: "Those big jars, by the way, are called aryballos or urpus in Quechua." | |
| N/A | No | Voiceover/Caption | N: "Quechua is such a cool-sounding language." | |
| N/A | No | Voiceover/Caption | N: "We heard some people speaking it in town when I was there, remember?" | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Llamas through window. | I do not take a panorama as it requests |
| N/A | No | Voiceover/Caption | J: "Ahh, isí! Many local people still speak it today." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Chicha mugs | |
| N/A | No | Voiceover/Caption | N: "Look at the interface to know what photo to take next." | |

| | | | | |
|---|---|---|---|---|
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Chicha jugs | |
| N/A | No | Voiceover/Caption | N: "Wow, we've got some gorgeous images to choose from here" | |
| N/A | No | Voiceover/Caption | N: "So, José, why did you suggest the Temple of the Three Windows for these chicha photos?" | |
| N/A | No | Voiceover/Caption | J: "Well, Bingham's team found more than 50 broken beer cups on the terrace here." | |
| N/A | No | Voiceover/Caption | J: "Some people think the Inca might have thrown them out the window as part of a ceremony." | |
| N/A | No | Voiceover/Caption | N: "Let's get a photo of the windows." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| N/A | No | Voiceover/Caption | N: "Maybe we can also get an updated take on the Bingham photo I just sent over. Can you match it?." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Replicate Bingham's photo." [image] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Windows | |
| N/A | No | Voiceover/Caption | N: "Yep, just like that. Thanks!" | |
| N/A | No | Voiceover/Caption | J: "Cool, cool… Time for a photo of the whole plaza?" | |
| N/A | No | Voiceover/Caption | N: "Good idea." | |
| N/A | No | Voiceover/Caption | N: "Let's recreate this Bingham panorama of all the important temples here." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Replicate Bingham's photo." [image] | |
| N/A | No | Voiceover/Caption | N: "If we can get three different landscape shots, we can stitch | |

| | | | | |
|---|---|---|---|---|
| | | ion | them together." | |
| N/A | No | Voiceover/Capt ion | N: "So, chicha was consumed by the living and given to the mummies?" | |
| N/A | No | Voiceover/Capt ion | J: "¡Exactamente! It was probably also given as offerings to the sun god Inti and Pachamama - who you call 'Mother Earth.'" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Replicate Bingham's panorama of the Sacred Plaza by taking 3 photos." [3 images] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Panorama 1 | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Panorama 2 | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Panorama 3 | |
| N/A | No | Voiceover/Capt ion | N: "Sweet, you nailed it." | |
| N/A | No | Voiceover/Capt ion | N: "We also have reconstruction of some flowing chicha that could go on the alter-shaped rock in the plaza." | |
| N/A | No | Voiceover/Capt ion | N: "Can you find it and tell us where to place the digitals?" | |
| Press Right Trigger Button | No | Toggle Overlay | Populates/Depopulates flowing chicha | Repeated |
| N/A | No | Voiceover/Capt ion | J: "The Inca believed ancestral spirits would receive the chicha if they poured it into the ground, or sacred offering rocks. Like this one." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several |

| | | | | |
|---|---|---|---|---|
| | | | | times. |
| N/A | No | Voiceover/Caption | N: "Let's get a close-up of the beer seeping into the rock and ground with the Temple of the Three Windows in the background. I sent a sketch of what I mean." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| N/A | No | Voiceover/Caption | J: "We're almost done with this section, Nat? Days can pass by quickly in Machu Picchu, ya sabes." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a close-up of the beer cup with the Temple of the Three Windows in the background." [sketch] | |
| N/A | No | Voiceover/Caption | N: "Yeah, you're right José. We gotta keep track of the time." | |
| N/A | No | Voiceover/Caption | N: "I think this is the last shot we need for this section." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a close-up of the beer cup with the Temple of the Three Windows in the background." [sketch] | |
| Press Right Grasping and Trigger Button | Yes | Looking through view finder | Beer cup | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Beer Cup | |
| N/A | No | Voiceover/Caption | N: "And our photographer nailed it. One hundred percent." | |
| N/A | No | Voiceover/Caption | N: "That was the last shot from this photo-shoot! I know we're all bummed to leave the beer behind but there's so many more interesting things to see here. Where to next?." | |
| N/A | No | Voiceover/Caption | N: "This is an iguana, one of the three types of lizards you'll find roaming the estate." | It does not seem to have the size/shape of an iguana. |
| N/A | No | Voiceover/Caption | N: "They lay in the sun because their bodies don't produce warmth on their own." | |
| N/A | No | Voiceover/Caption | N: "A friend of mine once went to Peru just to see the iguanas." | |
| N/A | No | Voiceover/Caption | J: "Yes, Peru is famous for many types of colorful iguanas!" | |

|  |  |  | ion |
| --- | --- | --- | --- |
| N/A | No | Voiceover/Capt<br>ion | N: "We'll use this area as a backdrop for an article about arriving at Machu Picchu through the ages." |
| Look at palm of left hand | No | Photo Assignment Interface | "We'll use this area as a backdrop for an article about arriving at Machu Picchu through the ages." [start button] |
| N/A | No | Voiceover/Capt<br>ion | N: "Great! Let's get started! José?" |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | J: "During the 15th century, the Inca reached this place via what we call the Inca Trail." | |
| N/A | No | Voiceover/Caption | J: "Let's start with a photo of Machu Picchu Mountain. I uploaded a sketch you can use as a reference." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a photo of Machu Picchu Mountain." [sketch] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu Mountain | |
| N/A | No | Voiceover/Caption | N: "Epic shot. See how the jungle is creeping up on the terraces?" | |
| N/A | No | Voiceover/Caption | N: "We can fix that! Our digital team prepared an overlay to highlight the trail." | |
| N/A | No | Voiceover/Caption | N: "Trace the trail to show us where it goes, and it will appear." | |
| Press Right Grasping + Release Trigger Button | No | Slider | Machu Picchu Mountain Trail | |
| N/A | No | Voiceover/Caption | J: "This Qhapaq Ñan system of trails is actually older than the Inca." | |
| N/A | No | Voiceover/Caption | N: "And there's our trail! Cool, huh?" | |
| N/A | No | Voiceover/Caption | N: "Let's get that trail on film. You'll need two different shots to get the whole thing." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu Mountain Trail | |
| N/A | No | Voiceover/Caption | N: "That's great. Now you can get the other half of the trail..." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu Mountain Trail | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "And that's the second shot. Perfect. Now we can stitch the together to show the whole trail." | |
| N/A | No | Voiceover/Caption | J: "The trail ends next to that ruin I just sent you a picture of. Can you get a photo like in my drawing?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a shot with the kallanka in the background" [sketch] | |
| N/A | No | Voiceover/Caption | J: "That's a kallanka, a place people could gather." | |
| N/A | No | Voiceover/Caption | J: "This was as far into the estate as most travelers were allowed to come." | |
| N/A | No | Voiceover/Caption | N: "Maybe a panorama would work well here." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Kallanka | |
| N/A | No | Voiceover/Caption | N: "Great shot!" | |
| N/A | No | Voiceover/Caption | J: "The pilgrims likely brought offerings, like the river rocks you can still see in the grass" | |
| N/A | No | Voiceover/Caption | J: "creating a stack sometimes called a apacheta around that big ceremonial rock." | |
| N/A | No | Voiceover/Caption | N: "Our digital team made a reconstruction of the pile of stones that used to be here." | |
| N/A | No | Voiceover/Caption | N: "We just need our photographer to point out where it goes." | |
| N/A | No | Voiceover/Caption | J: "Ah, ibuena!" | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping + Release Trigger Button | No | Slider | Apacheta | |
| N/A | No | Voiceover/Caption | J: "The river stones might have represented fertility, because rivers watered the crops." | |
| N/A | No | Voiceover/Caption | N: "Interesting! And, wow, that's a lot of rocks!" | |

| | | | | |
|---|---|---|---|---|
| | | ion | | |
| N/A | No | Voiceover/Caption | N: "Let's get some pics of this apacheta and also of the ceremonial rock." | |
| N/A | No | Voiceover/Caption | N: "In thee interface there's a list of shots we'd like to get." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Apacheta | |
| N/A | No | Voiceover/Caption | N: "Oh this is going to look cool in the mag." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take the following photos: Apacheta (stone pile) with a building in the background. Just the ceremonial rock (the large shared rock with steps). Apacheta ceremonial rock | together." [sketch of photographer] |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Ceremonial rock and Apacheta | |
| N/A | No | Voiceover/Caption | N: "Nailed it." | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Apacheta | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take the following photos: Apacheta (stone pile) with a building in the background. Just the ceremonial rock (the large shared rock with steps). Apacheta ceremonial rock | together." [sketch of photographer] |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and | Yes | Take photo | Photo assignment - Ceremonial rock | |

| Input | | Type | Content | Notes |
|---|---|---|---|---|
| Trigger Button | | | | |
| N/A | No | Voiceover/Caption | N: "Really great. I love how you framed the shot." | |
| N/A | No | Voiceover/Caption | N: "This is as far as most people could go, you said José?" | |
| N/A | No | Voiceover/Caption | J: "Claro. Only the elite and their servants could enter the estate." | |
| N/A | No | Voiceover/Caption | N: "I guess this view wasn't a bad consolation prize." | |
| N/A | No | Voiceover/Caption | J: "Sí, true. But now anyone can enter via those stairs next to the house." | |
| N/A | No | Voiceover/Caption | N: Let's get a picture of those too, the modern entrance. They're marked in the Interface." | |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a photo of the staircase next to the building" [sketch of building and staircase. Yellow circle around staircase.] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a photo of the staircase next to the building" [sketch of building and staircase. Yellow circle around staircase.] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Stairs by house | |
| N/A | No | Voiceover/Caption | N: "Great shot." | |
| N/A | No | Voiceover/Caption | N: "Could you do me a favor?" | |
| N/A | No | Voiceover/Caption | N: "The photo I took of the vista when I was there has a few people in the way..." | |
| N/A | No | Voiceover/Caption | N: "Could you get the same photo without the people?" | |
| Look at palm of | No | Photo | "Retake this photo of the estate without the tourists." [Image | |

| | | | | |
|---|---|---|---|---|
| left hand | | Assignment Interface | of four people posing in front of Machu Picchu vista] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu vista | Doesn't complete objective. |
| Look at palm of left hand | No | Photo Assignment Interface | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Look at palm of left hand | No | Photo Assignment Interface | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] | |
| Press Right Grasping and Trigger Button | Yes | Looking through view finder | Photo assignment - Machu Picchu vista | |
| N/A | No | Voiceover/Caption | N: "Don't forget you can check the interface to see which photo to take next!" | |

| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu vista | Doesn't complete objective. |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several times. |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu vista | |
| N/A | No | Voiceover/Caption | N: "Thanks, you're awesome." | |
| N/A | No | Voiceover/Caption | N: "Wow, we've wrapped up this story already! Great photos! Ready to move to something else?" | |
| N/A | No | Voiceover/Caption | N: "Congrats, that's a wrap on the article shots!" | |
| N/A | No | Voiceover/Caption | N: "Only one shot missing now… the most important one! We need a good cover shot." | |
| N/A | No | Voiceover/Caption | J: "Ah, isí! Machu Picchu after dark - few people get to see this!" | |
| N/A | No | Voiceover/Caption | N: "Super exciting, right? Let's take a break and meet back at the vista point after sunset!" | |
| N/A | No | Voiceover/Caption | J: "We're back where we met! Normalamente the sites is off-limits at night, so this is very special." | |
| N/A | No | Voiceover/Caption | N: "Thank you so much for making this happen, José!" | |
| N/A | No | Voiceover/Caption | N: "Machu Picchu by moonlight is exactly what we need for the cover." | |

| | | | | |
|---|---|---|---|---|
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to spot in field |
| N/A | No | Voiceover/Caption | N: "Ready to take the final shots for our special edition of National Geographic magazine?" | |
| N/A | No | Voiceover/Caption | N: "Look at the palm of your left hand. See the Interface?" | |
| Look at palm of left hand | No | Photo Assignment Interface | "Ready to take the final shots for our special edition of National Geographic magazine" [start button] | |
| N/A | No | Voiceover/Caption | N: "I see you've already got your camera on night settings, great." | |
| N/A | No | Voiceover/Caption | N: "A low angle shot of the moon shining on one of the landmarks here could be gorgeous." | |
| N/A | No | Voiceover/Caption | N: "Ceremonial rock, Huayna Picchu, the building here… take your pick!" | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Moon shining on building. | |
| N/A | No | Voiceover/Caption | N: "Wow, I wish I could see this in person." | |
| N/A | No | Voiceover/Caption | J: "Sí, Mama Quilla looks very beautiful tonight!" | |
| N/A | No | Voiceover/Caption | N: "If you stand with your back to the moon, you should be able to see the Milky Way in amazing detail." | |
| N/A | No | Voiceover/Caption | N: "No city lights to blot it out like here in D.C.!" | |
| N/A | No | Voiceover/Caption | J: "The stars you can see there are different than the ones we see down here anyway." | |
| N/A | No | Voiceover/Caption | N: "True. When the digital team talked to you, you mentioned… dark constellations?" | |
| N/A | No | Voiceover/Caption | N: "They made an overlay of them. We just need to trace where it should go." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu under moon | |
| Press Left Joystick | No | Move | Jump to place in world | Repeated several |

| Press Right Grasping + Release Trigger Button | No | Slider | Dark Constellations | |
|---|---|---|---|---|
| N/A | No | Voiceover/Caption | J: "Sí, they are the animal shapes the Inca saw in the darkness between the stars." | |
| N/A | No | Voiceover/Caption | N: "Wow, I never thought of looking at the night sky that way." | |
| N/A | No | Voiceover/Caption | N: "We definitely need to take a photo of this! Try to get Machu Picchu Mountain in the shot as well." | |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Dark Constellations | |
| N/A | No | Voiceover/Caption | N: "José, when you look up at the night sky, do you normally see these dark constellations?" | |
| N/A | No | Voiceover/Caption | J: "¡Sí! My grandmother showed them to me when I was young." | |
| N/A | No | Voiceover/Caption | J: "My favorite is Yacana, a mother llama and her baby." | |
| N/A | No | Voiceover/Caption | J: "When you see her in the sky, you know it's almost rainy season." | |
| N/A | No | Voiceover/Caption | N: "Oh, that's handy! Well, it's time to set up the grand finale shot: a digital reconstruction of Machu Picchu at night in the 15th century. Please head over to the vista spot to set it up." | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to spot in field |
| N/A | No | Voiceover/Caption | N: "This reconstruction is the largest the graphics team's ever done!" | |
| N/A | No | Voiceover/Caption | N: "We're gonna need you to outline a much bigger space this time." | |
| Press Right Grasping + Release Trigger Button | No | Slider | Buildings | |
| N/A | No | Voiceover/Caption | N: "There are more than 150 buildings down there." | Entire surrounding ridge |
| N/A | No | Voiceover/Caption | N: "We saw houses and temples, but there are also baths, storehouses and astronomical observatories." | |
| N/A | No | Voiceover/Caption | N: "Wow, they saved their most spectacular work for last. Welcome to the 15th century." | |

| | | | |
|---|---|---|---|
| N/A | No | Voiceover/Caption | N: "Magical… like the Inca never left… We still don't know why they did leave, do we?" |
| N/A | No | Voiceover/Caption | J: "Not really, no. Maybe it was after the Spanish kidnapped the Inca king." |
| N/A | No | Voiceover/Caption | J: "All we know is that the Spanish never found this place." |
| N/A | No | Voiceover/Caption | J: "It was unknown to most of the world until Bringham came." |
| N/A | No | Voiceover/Caption | N: "It sure looks inhabited in this reconstruction Perfect for the cover." |
| N/A | No | Voiceover/Caption | N: "I sent over the layout, if you can get a good shot to fit it. Of as much of the estate as possible." |
| Look at palm of left hand | No | Photo Assignment Interface | "Take a photo of the estate at night, to fit the cover layout." [sample cover] |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu reconstructed "estate" |
| N/A | No | Voiceover/Caption | N: "Legendary. A truly special final shot." |
| N/A | No | Voiceover/Caption | N: "Thank you both so much for all the amazing work you've done today." |
| N/A | No | Voiceover/Caption | J: "Thanks for bringing us together, Natalie. And to your team for the digital trips back in time." |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu reconstructed "estate" |
| N/A | No | Voiceover/Caption | J: "When this edition comes out, I'm going to buy all the magazines in the store and share it with everyone." |
| Press Right Grasping and Trigger Button | Yes | Take photo | Photo assignment - Machu Picchu reconstructed "estate" |
| N/A | No | Voiceover/Caption | N: "Ahh, you're so sweet, José. Well, we should say our goodbyes… unless you want to explore a bit more?" |
| Look at palm of | No | Photo | "Take a photo of the estate at night, to fit the cover |

| | | | | |
|---|---|---|---|---|
| left hand | | Assignment Interface | layout." [sample cover] | |
| N/A | No | Voiceover/Caption | N: "Take your time; the team can take you back whenever you're done." | |
| Press Right Trigger Button | No | Toggle Overlay | Reconstructed Machu Picchu "estate" | |
| Press Left Joystick | No | Move | Jump to position highlighted in world | Move to spot in field |
| N/A | No | Voiceover/Caption | N: "Good to see you're back!" | |
| N/A | No | Voiceover/Caption | N: "Amazing work shooting those pictures at Machu Picchu!" | |
| N/A | No | Voiceover/Caption | N: "With your photos the article truly shines a new light on this iconic site." | |
| N/A | No | Voiceover/Caption | N: "Don't forget you can chat with a friend while you're exploring. Simply start a party from the Oculus Menu." | |

Gameplay Log:

| Interactive Object/Being | Camera / Photos | Physical Touch Type | Haptic Visuality | Details | Other |
|---|---|---|---|---|---|
| Natalie | No | N/A | No - Did not respond to touch | Voiceover Guide at Base | |
| Jose | No | N/A | No - Did not respond to touch | Voiceover Guide at Machu Picchu | |
| Refrigerator | No | Right Grasping Button | No - Did not respond to touch | N/A | |
| Sink/Faucet | No | Right Grasping Button | No - Did not respond to touch | N/A | |
| Cabinets | No | Right Grasping Button | No - Did not respond to touch | N/A | |

| | | | | |
|---|---|---|---|---|
| Stove | No | Right Grasping Button | No - Did not respond to touch | N/A |
| Door | No | Right Grasping Button | No - Did not respond to touch | N/A |
| Door | No | Walkthrough | No - Did not respond to touch | Blacks out world |
| Trunk | No | Right Grasping Button | No - Did not respond to touch | N/A |
| Window | No | Walkthrough | No - Did not respond to touch | Blacks out world |
| Phone | No | Pick up phone | Yes - Seeing virtual hand/feeling controller | Hold object but no display on phone's screen (unlocks later) |
| Phone + Table | No | Place phone on Table | Yes - Seeing virtual hand/feeling controller | Felt natural to place phone on Table (not drop anywhere) |
| Windows in base | Yes | Press Right Grasping + Trigger Button | Yes - Engaged with area | Appreciated symmetry |
| National Geographic Magazine | No | Right Grasping Button | Yes - Seeing virtual hand/feeling controller | Did not respond to touch. Featured image of uncompleted mission (Machu Picchu) |
| Activity Workspace - Arrow | No | Move hand | Yes - Seeing virtual hand/feeling controller | Selected Antarctica Activity |
| Activity Workspace - Explore Button | No | Move hand | Yes - Seeing virtual hand/feeling controller | Started Antarctica Activity |

Antarctica

| | | | | |
|---|---|---|---|---|
| Mike | No | N/A | No - Felt omnipotent | Voiceover Guide throughout the Antarctic Peninsula Transcripts in Interaction Log |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to move faster |
| Camera | Yes | Press Right Grasping + Trigger Button | Yes - Framing scene | Icebergs |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to move faster |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Icebergs      Zoom, change orientation. Took multiple photos. |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to move faster |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Seals    Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | IcebergZoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Seals    Zoom. Took multiple photos. |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to move faster |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | IcebergZoom. Took multiple photos. |

| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Orcas | Zoom. Took multiple photos. |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Penguins | Zoom. Took multiple photos. |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to move faster | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Penguins | Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Icebergs | Zoom, change orientation. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Singular penguin swimming along and jumping out of water | Zoom. Took multiple photos. Mostly missed shot. |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Trying to change position | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Singular penguin swimming along and jumping out of water | Zoom. Took multiple photos. Mostly missed shot. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Icebergs | Zoom, change orientation. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Penguins | Zoom, change orientation. Took multiple photos. |
| Penguin | No | Jump / Move | Yes - Fright | Penguin jumped on kayak and scared me | |
| Camera | Yes | Press Right Grasping + | Yes - Framing | Penguin who scared me. | Missed shot. |

| | | | | | |
|---|---|---|---|---|---|
| | | Trigger Button, Press Right Joystick | scene | | |
| Kayak Paddles | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | | Trying to change position |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Icebergs | Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Penguins | Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Minke whale | Zoom, change orientation. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Seagulls | Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Penguins | Zoom. Took multiple photos. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Icebergs | Zoom. Took multiple photos. |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Felt like climbing | Moving toward screws that my carabiners auto lock into | |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Discovering physical mechanics | Cannot stick in snow | |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Trying to resume climbing | Did not respond to touch | Minke whale encounter from ice shelf landing |
| Camera | Yes | Press Right Grasping + Trigger Button, Press | Yes - Framing scene | Minke whale | Zoom, change orientation. Took multiple photos. |

| | | | | | |
|---|---|---|---|---|---|
| | | Right Joystick, Rotate Wrist | | | |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Felt like climbing | Chose going left (difficult path) | I wanted a challenge |
| Ice shelf | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Feeling physical environment | Hight, danger, beauty | Felt several times throughout experience when looking down |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Seagulls with icebergs | Zoom, change orientation. Took multiple photos. |
| Ice shelf | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Feeling physical environment | Hight, danger, beauty | Felt several times throughout experience when looking down |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Felt like climbing | Moving toward screws that my carabiners auto lock into | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Snow mobile in crevasse | Gave me a sense of dread |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Felt like climbing | Moving toward screws that my carabiners auto lock into | |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Discovering physical mechanics | Cannot stick in brittle ice | I didn't notice the dialogue about this so I discovered it slowly by noticing that ice if the ice cracks when I hit it, then I cannot stick my ice pickaxe into it. |
| Ice Pickaxes | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Felt like climbing | Moving toward screws that my carabiners auto lock into expedition stories I've read. | Reminded me of |
| Ice shelf | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Feeling physical environment | Hight, danger, beauty. Accompanying ominous sound. times throughout experience when looking down | Felt several |
| Snow Mobile in Crevasse | Yes | N/A | Yes - Feeling physical environment | Made me think of people of have died this way expedition stories I've read. | Reminded me of |

| Ice shelf | No | Press Both Grasping Buttons + Swing and Pull Arm | Yes - Feeling physical environment | Ice breaks away where I was climbing. Did NOT happen where I felt the most dread. | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | View from atop ice shelf | beautiful |
| Waving to ship | No | Waving hand towards ship | Yes - Feeling the environment | Could just make out ship | Prompted from dialogue. Could see virtual hand. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Icebergs | Zoom. Took multiple photos. |
| Ropes | No | Press Right Grasping Button | Yes - Moving an object | Securing tent | Repeated several times |
| Pickup and Move Crates | No | Press Both Grasping Buttons | Yes - Activated real muscle memory | Blocking wind | Repeated several times |
| Tent Zipper | No | Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened tent to inside | |
| Kerosene lamp | No | Reach out hand to object | No - Not a touch lamp | Illuminated tent | |
| Voiceover in tent | No | N/A | Yes - Feeling physical environment | Discussing hypothermia without tent reminded me of survival stories | |
| Kerosene lamp | No | Reach out hand to object | No - Did react realistically | Illuminated tent | |
| Tent Zipper | No | Press Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened tent to outside | |
| Boxes | No | Press and Release Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened boxes to find sleeping bag | |
| Sleeping Bag | No | Press Right Grasping Button + Moving Arm | Yes - Felt physical environment | Found sleeping bag | |

| Sleeping Bag | No | Release Right Grasping Button + Moving Arm | No - Did not match what I saw | Replaced sleeping bag because the app wasn't recognizing the object |
|---|---|---|---|---|
| Locator Beam | No | Press and Release Right Grasping Button + Moving Arm | Yes - Felt physical environment | Found and replaced item because it was not the right object |
| Boxes | No | Press and Release Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened boxes to find sleeping bag |
| Goggles | No | Press and Release Right Grasping Button + Moving Arm | No - No discernable visual difference | Found correct object and placed it on my head |
| Boxes | No | Press and Release Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened extra box out of curiosity and then went to the sleeping bag box again |
| Sleeping Bag | No | Press Right Grasping Button + Moving Arm | Yes - Felt physical environment | Found sleeping bag |
| Boxes | No | Press and Release Right Grasping Button + Moving Arm | Yes - Felt physical environment | Close boxes |
| Tent Zipper | No | Press Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened tent to outside |
| Tent in wind | No | N/A | Yes - Felt physical environment | Tent was moving violently |
| Kerosene Lamp | No | Press and Release Right Grasping Button + Moving Arm | No - Not a touch lamp | Didn't react to my touch as I expected |
| Tent Zipper | No | Press Right Grasping Button + Moving Arm | Yes - Felt physical environment | Opened tent to outside |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Penguins and Sunrise   Zoom. Took multiple photos. Tope three fave parts |

| | | | | | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Icebergs and Aurora Borealis | Zoom, change orientation. Took multiple photos. Top three fave parts |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Penguin colony scene. Also included sunrise and Aurora Borealis | Zoom, change orientation. Took multiple photos. Top three fave parts |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Helicopter landing | Zoom. Took multiple photos. Top three fave parts |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Penguin colony scene. Also included sunrise and Aurora Borealis | Zoom, change orientation. Took multiple photos. Top three fave parts |

Base

| | | | | |
|---|---|---|---|---|
| Whale Decoration | No | Right Grasping Button | No - Did not respond to touch | N/A |
| Scroll Photos | Yes | Arm Movement | Yes - Felt physical environment | Reviewing photos |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Displaying on wall |
| Scroll Photos | Yes | Arm Movement | Yes - Felt physical environment | Reviewing photos |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Displaying on wall |
| Scroll Photos | Yes | Arm Movement | Yes - Felt physical environment | Reviewing photos |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Displaying on wall |

| | | | | | |
|---|---|---|---|---|---|
| Scroll Photos | Yes | Arm Movement | Yes - Felt physical environment | Reviewing photos | |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Displaying on wall | |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Delete photo | |
| Scroll Photos | Yes | Arm Movement | Yes - Felt physical environment | Reviewing photos | |
| Grab Photo | Yes | Press and Release Grasping Button + Arm Movement | Yes - Felt physical environment | Share photo | |
| Share Photo | Yes | Press Right Trigger Button | Yes - Felt physical environment | Share photo | |
| National Geographic Magazine Poster | No | Right Grasping Button | No - Did not respond to touch | N/A | Emperors of Ice Issue |
| Phone | No | Pick up phone | Yes - Seeing virtual hand/feeling controller | "Voice message from Natalie" and play button | |
| Phone | No | Press Play button | Yes - Felt physical environment | Listen to message | Move phone to ear first. Does nothing. |
| Activity Workspace - Arrow | No | Move hand | Yes - Seeing virtual hand/feeling controller | Selected Antarctica Activity | |
| Activity Workspace - Explore Button | No | Move hand | Yes - Seeing virtual hand/feeling controller | Started Antarctica Activity | |

| Machu Picchu | | | | |
|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Llamas Zoom. Took multiple photos. |

| | | | | | |
|---|---|---|---|---|---|
| Movement | Yes | Pressing left joystick | Yes - Discovering area | Getting closer to and discovering new Llamas | Barrier to prevent touch! |
| Llama | Yes | N/A | Yes - Feels close | Chews, spits, moves on loop | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Llamas | Zoom, change orientation. Took multiple photos. Top three fave parts |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Flower (unknown species) | Zoom, change orientation. Took multiple photos. Top three fave parts |
| Corkboard of Hiram Bringham Photos | Yes | N/A | Yes - Photorealistic Photos | Photos from expedition with labels | "Hiram Bingham 1875-1956" _"First Photograph - 07/24/1911" _"Rediscovery of Machu Picchu" _ "Machu Picchu Expeditions" |
| Camera | Yes | Press Right Grasping + Move Arm | Yes - Feeling Object | Putting on hat | Machu Picchu (tourist?) hat |
| Machu | No | Release Right Trigger Button + Moving Arm | Yes - Pointing to areas and text Yes - Framing scene | Reading along with where I was pointing  Andes Mountains | Zoom. Took multiple photos. |
| Picchu Map Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | | | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Machu Picchu | Zoom, change orientation. Took multiple photos. |
| Camera Inca Homes | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Andes Mountains | Zoom. Took multiple photos. |
| Photo | Yes | Hold left hand open in line of vision  Move hand | Yes - Envisioning opening a thing in my | Inca Homes Photo Session Pressed Start | "In this photo session you'll photograph a digital reconstruction of an Inca home." |
| Assignment | Yes | | | | |
| Interface | Yes | | | | |
| Photo | Yes | Move hand | | Pressed | |

| | | | | | |
|---|---|---|---|---|---|
| Assignment Interface Photo Assignment Interface Camera | | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | hand  Yes - Envisioning opening a thing in my hand  Yes - Envisioning opening a thing in my hand Yes - Framing scene | Continue Photoshoot Inca home - For Assignment | Required. Zoom, change orientation. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Inca Homes Photo Session | Review assignment - Photo |
| Inca Home Wall | No | Press Right Grasping + Release Trigger Button | Yes - Imagining interaction | Inca Homes Photo Session | Trying to Figure out what to do |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Inca Homes Photo Session | Review assignment - Trace |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Inca Homes Photo Session | Populated interior home and roof |
| Photo Assignment Interface Basket (maize) Staffs Camera | Yes No No Yes | Hold left hand open in line of vision  Right Grasping Button Right Grasping Button Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Envisioning opening a thing in my hand  No - Did not respond to touch No - Did not respond to touch Yes - Framing | Inca Homes Photo Session N/A N/A Stove | Review assignment - Trace Required. Zoom. |

scene

| | | | | | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Tapestry | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Skulls | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Skulls with offerings | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Sleeping area | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Home exterior | Required. Zoom. |
| Photo Assignment Interface | Yes Yes Yes | Hold left hand open in line of vision  Move hand | Yes - Envisioning opening a thing in my hand | Inca Homes Photo Session Pressed Start | "In this photo session you'll photograph a digital reconstruction of an Inca home." |
| Photo Assignment Interface Photo Assignment Interface | | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand  Yes - Envisioning opening a thing in my hand | Inca Homes Photo Session | Review assignment |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Natural rock | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my | Inca Architecture Session | Review assignment |

| | | hand | | | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Rougher stones | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Smooth stones | Required. Zoom. |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Inca Architecture Session | Populated wooden beams |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Beams | Required. Zoom. |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Inca Architecture Session | Populated beams with pegs |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Beams with pegs. | Required. Change orientation. Repeated once |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Inca Architecture Session | Populated thatch roof |
| Camera | Yes | Press Right Grasping + Trigger Button,Move Wrist | Yes - Framing scene | Thatched roof | Required. Change orientation. Repeated once |
| Inca architecture | No | Placing hands on window sill and leaning forward | Yes- Feeling interaction | Blacked out as I moved forward | Repeated once |
| Camera | Yes | Press Right Grasping + Trigger Button,Move Wrist | Yes - Framing scene | Window | Change orientation. Repeated once |
| Toggle | No | Press Trigger Button | No | Inca Architecture Session | |
| Overlay | No | | No | Inca Home Session | |
| Toggle | Yes | | Yes - | Inca Homes | |
| Overlay | Yes | Press Trigger Button | Envisioning opening a thing in my hand | Completed Sessions Opens optional shots | Brigham photo match, yarn spindle, match sketch, composition, composition with condor |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Scroll Through optional shots | |
| Photo Assignment Interface | | Hold left hand open in line of vision + Move right hand | Yes - | | |
| Photo | | Hold left hand open in line of vision + Move right | hand Yes - | | |

| | | | | | |
|---|---|---|---|---|---|
| Assignment Interface - Arrows | | hand | Envisioning opening a thing in my hand | | |
| Camera Mummy Ceremony | Yes | Press Right Grasping + Trigger Button, Move Wrist | Yes - Framing scene | Condor scene | Optional. Repeated many times. Reviewing my playthrough, I realize that I didn't not have the temple of the condor in the shot, which is why it didn't work. |
| Photo Assignment Interface | Yes Yes Yes | Hold left hand open in line of vision  Move hand | Yes - Envisioning opening a thing in my hand | Mummy Ceremony Session  Pressed Start | "In this photo session you'll photograph a digital reconstruction of an Inca home." |
| Photo Assignment Interface | | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Mummy Ceremony Session | "Copy Bingham's photo of the Principal Temple." [photo] |
| Photo Assignment Interface | | | Yes - Envisioning opening a thing in my hand  Yes - Envisioning opening a thing in my hand | | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Copy Bingham's Photo of the Principal Temple | Required. Zoom. Failed - Wrong Angle |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Copy Bingham's Photo of the Principal Temple | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Mummy Ceremony Session | "Find this photo on one of the Principle Temple walls and photograph it." [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Copy Bingham's Photo of the Principal Temple | Required. Zoom. |
| Photo Assignment | Yes | Hold left hand open in line of vision | Yes - Envisioning | Mummy Ceremony | Review assignment - Trace |

| Interface | | | opening a thing in my hand | Session | |
|---|---|---|---|---|---|
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Mummy Ceremony Session | Royal mummy |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy | Zoom. This was a striking scene. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Make close-ups of the following: The mummy's face. The mummy's bracelets. The offerings at the mummy's feet. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy offerings | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy bracelets | Required. Zoom. Repeated. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Make close-ups of the following: The mummy's face. The mummy's bracelets. The offerings at the mummy's feet." |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy face | Required. Zoom, change orientation. Repeated several times. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Find the following items and add them to the offerings: The llama statue. The tumi (knife)." [sketch] |

| | | | | | |
|---|---|---|---|---|---|
| Tumi | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up tumi (knife) from corner and place with offerings at mummy's f | Required |
| Llama | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up llama (statue) from corner and place with offerings at mummy's | Required |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy Zoom. Change orientation. This was a striking scene. | |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Take a low-angle shoot of the entire mummy with the offerings at his feet." |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy Zoom. Change orientation. This was a striking scene. | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Royal mummy Required. Zoom. Change orientation. | |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Copy Bingham's photo of the back wall of the Principal Temple." [photo] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Matching Bingham's photo | Required. Zoom. |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Mummy Ceremony Session | Populated mummy offerings |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Take a picture of the mummy with the blanket with the offerings in the foreground." [sketch] |

| | | | | | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Matching offerings sketch | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Get a shot of the mummy ceremony aligned under the hill behind the temple." [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Matching hill/temple sketch | Required. Zoom. |
| Toggle Overlay | No | Press Trigger Button | No | Ancestor Worship | |
| Photo Assignment Interface Wawkis | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | Completed Activities/Available Activities |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Wawkis | "Have you ever heard of 'wawkis'? We tell the reader all about them in this section of the article." |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Pressed Start | |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Wawkis | "Indicate where the wawkis should appear. Point at the icon. Press the trigger." |
| Toggle Overlay | No | Press Trigger Button | No | Wawkis | Populates golden wawki in location |

| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Wawki in niche | Required. Zoom. |
|---|---|---|---|---|---|
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Wawkis | "Take a photo of the wawki double-framed." [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Wawki double framed | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Lizard on wall | Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Wawki with sun | Required. Zoom. |
| Toggle Overlay | No | Press Trigger Button | No | Wawkis | Populates silver wawki in location |
| Wawiki | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up wawki and place in another niche | Required |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Wawki with Huayna Picchu | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Wawkis | "Take a photo of the gold and silver wawkis in one niche, with the sky." [sketch] |
| Wawiki | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up silver wawki and place in another niche | Required |
| Wawiki | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up golden wawki and place in niche with silver wawki | Required |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Silver and golden wawkis together | Required. Zoom. |
| Toggle | No | Press Trigger Button | No | Wawkis | Populates bronze wawki in location |

| Element | | Action | | Subject | Description |
|---|---|---|---|---|---|
| Overlay Toggle | No | Press Trigger Button | No | Wawkis | Populates bronze wawki in location |
| Overlay Toggle | No | Press Trigger Button | No | Wawkis | Populates bronze wawki in location |
| Overlay Wawiki | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up silver wawki and place in another niche | Required |
| Wawiki | No | Press and Release Right Grasping Button | Yes - Feeling object | Pick up golden wawki and place in another niche | Required |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | All wawkis together | Required. Zoom. |
| Toggle Overlay | No | Press Trigger Button | No | Wawkis | Toggles all wawkis. Repeated. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor worship | Completed Activities/Available Activities |
| Beer Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "Ready to talk beer? In this section we'll dive into how beer played a role in Inca religion and ancestor worship." |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Pressed Start | |
| Slider | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Chicha | |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Llama through window. | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Chicha jugs. | Required. Zoom. |

| | | | | | |
|---|---|---|---|---|---|
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | 2/3 shots [sketch] |

| | | | | | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick, Rotate Wrist | Yes - Framing scene | Chicha jugs. | Required. Zoom. Change orientation. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | "Replicate Bingham's photo." [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Windows | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | "Replicate Bingham's photo." [sketch] |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | Replicate Bingham's panorama of the Sacred Plaza by taking 3 photos. [3 images] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Panorama 1 | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Panorama 2 | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Panorama 3 | Required. Zoom. |

| | | | | | |
|---|---|---|---|---|---|
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | "Take a close-up of the beer cup with the Temple of the Three Windows in the background." [sketch] |
| Camera - View Finder Only | Yes | Press Right Grasping Press Right Joystick, , Rotate Wrist | Yes - Framing scene | Beer Cup | Required. Zoom. |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Temple of Three Windows | "Take a close-up of the beer cup with the Temple of the Three Windows in the background." [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Beer Cup | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Beer Cup | Zoom. |
| Photo Assignment Interface | Yes Yes | Hold left hand open in line of vision  Move hand | Yes - Envisioning opening a thing in my hand | Ancestor Worship  Pressed Optional Shots  Pressed Arrows to Scroll | Completed Activities/Available Activities

Reads/Chooses "Get a close-up of a lizard bathing in the sun." Zoom. Lizard is moving in a loop. |
| Photo Assignment Interface | No Yes | Move hand  Pressing left joystick | Yes - Envisioning opening a thing in my hand | Going to where I remembered seeing a lizard  Lizard | Zoom. Repeated several times before the voiceover/caption was triggered. |
| Photo Assignment Interface | No | Press Right Grasping + Trigger Button, Press Right Joystick  Pressing left joystick | Yes - Envisioning opening a thing in my hand | Going to where I remembered seeing a lizard  Lizard | |
| Movement Camera Movement Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Envisioning opening a thing in my hand  Yes - | | Repeated many times trying to get the condor picture and accompanying voiceover/caption, but never got it. Zoom. |

| | | | | | |
|---|---|---|---|---|---|
| Inca Homes Movement Camera | | Pressing left joystick Press Right Grasping + Trigger Button, Press Right Joystick | Navigating World Yes - Framing scene Yes - Navigating World Yes - Framing scene<br><br>Yes - Navigating World Yes - Framing scene | Going to where I remembered trying to get the condor picture Condor scene | |
| Entrance Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Ancestor Worship | "We'll use this area as a backdrop for an article about arriving at Machu Picchu through the ages." [start button] |
| Photo Assignment Interface Photo Assignment Interface | Yes Yes | Move hand Move hand | Yes - Envisioning opening a thing in my hand Yes - Envisioning opening a thing in my hand | Pressed Start Arrival Through the Ages | "Take a photo of Machu Picchu Mountain." [sketch]. Seeing it against the skyline felt real.\ |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu Mountain | Required. Zoom. |
| Slider | No | Press Right Grasping + | Yes - Feeling | Machu Picchu | "fixing" the "wild jungle" |

| | | Release Trigger Button | interaction | Mountain Trail | |
|---|---|---|---|---|---|
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu Mountain Trail | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu Mountain Trail | Required. Zoom. |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | Take a shot with the kallanka in the background [sketch] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick  Press Right Grasping + Release Trigger Button  Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene  Yes - Feeling interaction  Yes - Framing scene | Kallanka  Apacheta | Required. Zoom.  Required. Zoom. |
| Slider | No | | | | |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Take the following photos: Apacheta (stone pile) with a building in the background. Just the ceremonial rock (the large shaped rock with steps). Apacheta ceremonial rock together." [sketch of photographer] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Ceremonial Rock and Apacheta | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Apacheta | Required. Zoom. Not realizing this isn't the shot that I need. |
| Photo | Yes | Move hand | Yes - | Arrival Through | "Take the following photos: Apacheta (stone pile) with a |

| | | | | | |
|---|---|---|---|---|---|
| Assignment Interface | | | Envisioning opening a thing in my hand | the Ages | building in the background. Just the ceremonial rock (the large shaped rock with steps). Apacheta ceremonial rock together." [sketch of photographer] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Ceremonial Rock | Required. Zoom. |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Take a photo of the staircase next to the building" [sketch of building and staircase. Yellow circle around staircase.] |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Take a photo of the staircase next to the building" [sketch of building and staircase. Yellow circle around staircase.] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Stairs by house | Required. Zoom. |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] |
| Photo Assignment | Yes | Move hand | Yes - Envisioning | Arrival Through the Ages | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu |

| | | | | | |
|---|---|---|---|---|---|
| Interface | | | opening a thing in my hand | | vista] |
| Photo Assignment Interface | Yes | Move hand | Yes - Envisioning opening a thing in my hand | Arrival Through the Ages | "Retake this photo of the estate without the tourists." [Image of four people posing in front of Machu Picchu vista] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu vista | Required. Zoom. Doesn't complete objective. |
| Camera | Yes | Press Right Grasping + Press Right Joystick | Yes - Framing scene | Machu Picchu vista | Viewfinder |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu vista | Required. Zoom. Doesn't complete objective. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu vista | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Llama at stairs | Zoom. |
| Photo Assignment Interface Photo Assignment Interface Camera | Yes Yes Yes | Hold left hand open in line of vision Move hand Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Envisioning opening a thing in my hand Yes - Envisioning opening a thing in my hand Yes - Framing | Cover Shot Pressed Start Moon shining on building | "Ready to take the final shots for our special edition of National Geographic magazine" "Start" Required. Zoom. |

scene

| Element | | Gesture | Interaction | Scene | Notes |
|---|---|---|---|---|---|
| Camera Slider | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu under moon | Zoom. |
| Dark Constellations | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Dark Constellations | Shows outline in yellow |
| | No | N/A | Yes- Feeling interaction | New way of looking at the sky | |
| Camera Slider | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Dark Constellations | Required. Zoom. |
| | No | Press Right Grasping + Release Trigger Button | Yes - Feeling interaction | Entire Mountain ridge 360-degrees | |
| Photo Assignment Interface | Yes | Hold left hand open in line of vision | Yes - Envisioning opening a thing in my hand | Cover Shot | "Take a photo of the estate at night, to fit the cover layout." [sample cover] |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu reconstructed "estate" | Required. Zoom. |
| Camera | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu reconstructed "estate" | |
| Camera Base | Yes | Press Right Grasping + Trigger Button, Press Right Joystick | Yes - Framing scene | Machu Picchu reconstructed "estate" | |

| | | | | | |
|---|---|---|---|---|---|
| National | No | Right Grasping Button | No - Did not | N/A N/A N/A | Machu Picchu |
| Geographic | No | Right Grasping Button | respond to | Reviewing photos | |
| Magazine | No | Right Grasping Button | touch  No - | Reviewing photos | |
| Poster | Yes | Arm Movement | Did not | Reviewing photos | |
| Door | Yes | Arm Movement  Arm | respond to | Displaying on wall | |
| handle #1 | Yes | Movement | touch  No - | Reviewing photos | |
| Door | Yes | Press and Release | Did not | Reviewing photos | |
| handle #2 | Yes | Grasping Button + Arm | respond to | Reviewing photos | |
| Scroll | Yes | Movement  Arm | touch  Yes - | Reviewing photos | |
| Photos | Yes | Movement | Felt physical | Displaying on wall | |
| Scroll | Yes | Arm Movement  Arm | environment | Reviewing photos | |
| Photos | Yes | Movement  Arm | Yes - Felt | Displaying on wall | |
| Scroll | Yes | Movement | physical | Reviewing photos | |
| Photos | Yes | Press and Release | environment | Reviewing photos | |
| Grab Photo | Yes | Grasping Button + Arm | Yes - Felt | Reviewing photos | |
| Scroll | Yes | Movement  Arm | physical | Displaying on wall | |
| Photos | Yes | Movement | environment | Share photo  Share | |
| Scroll | Yes | Press and Release | Yes - Felt | photo  Reviewing | |
| Photos | Yes | Grasping Button + Arm | physical | photos  Reviewing | |
| Scroll | Yes | Movement  Arm | environment | photos  Reviewing | |
| Photos | Yes | Movement | Yes - Felt | photos  Reviewing | |
| Scroll | Yes | Arm Movement  Arm | physical | photos  Reviewing | |
| Photos | Yes | Movement | environment | photos  N/A | |
| Grab Photo | Yes | Press and Release | Yes - Felt | "Voice Message | |
| Scroll | Yes | Grasping Button + Arm | physical | from Natalie" [play | |
| Photos | No | Movement  Press and | environment | button] | |
| Grab Photo | No | Release Grasping | Yes - Felt | Press Play | |
| Scroll | No | Button + Arm | physical | | |
| Photos | | Movement  Press Right | environment | | Emperors of Ice Issue |
| Scroll | | Trigger Button | Yes - Felt | | |
| Photos | | Arm Movement  Arm | physical | | N: "Don't forget you can chat with a friend while you're |
| Scroll | | Movement  Arm | environment | | exploring. Simply start a party from the Oculus Menu." |

| Photos | Movement  Arm | Yes - Felt |
| Grab Photo | Movement  Arm | physical |
| Grab Photo | Movement | environment |
| Share | Right Grasping Button | Yes - Felt |
| Photo | Right Grasping Button | physical |
| Scroll | Move hand | environment |
| Photos | | Yes - Felt |
| Scroll | | physical |
| Photos | | environment |
| Scroll | | Yes - Felt |
| Photos | | physical |
| Scroll | | environment |
| Photos | | Yes - Felt |
| Scroll | | physical |
| Photos | | environment |
| National | | Yes - Felt |
| Geographic | | physical |
| Magazine | | environment |
| Phone | | Yes - Felt |
| Phone | | physical |
| | | environment |
| | | Yes - Felt |
| | | physical |
| | | environment |
| | | Yes - Felt |
| | | physical |
| | | environment |
| | | Yes - Felt |
| | | physical |
| | | environment |
| | | Yes - Felt |
| | | physical |

| | | | environment | | |
|---|---|---|---|---|---|
| | | | Yes - Felt physical environment | | |
| | | | Yes - Felt physical environment | | |
| | | | Yes - Felt physical environment | | |
| | | | No - Did not respond to touch | | |
| | | | Yes - Seeing virtual hand/feeling controller | | |
| | | | Yes - Seeing virtual hand/feeling controller | | |
| Phone | No | Move hand | Yes - Seeing virtual hand/feeling controller | Press More Info | Brings up Voice Chat menu |
| Phone + Table | No | Place phone on Table | Yes - Seeing virtual hand/feeling controller | Felt natural to place phone on Table (not drop anywhere) | |

Appendix B

Safari Central VR Notes

Object Inventory:

| Object | Effects | Value | Share | Trade |
|---|---|---|---|---|
| Pangolin | Resize and reposition | N/A in this app | N/A in this app | N/A in this app |
| Elephant | Resize and reposition | | | |
| Jaguar | Resize and reposition | | | |
| Bear | Resize and reposition | | | |
| Rhino | Resize and reposition | | | |
| Lemur | Resize and reposition | | | |

Interface study:

| Place in App | Menu Item | On-Screen Image / Info | Effect | Other Information | Place On Screen | Physical Interaction T | Other |
|---|---|---|---|---|---|---|---|
| Opening Screen | Start App | Safari Central logo, "tap to start" | Opens Main Menu | N/A | | | |
| Main Menu | Animal Selection | Pangolin image, "Tswalu Kalahari" logo | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | Background text: "Meet an animal!", Background image: city skyline to forest with birds |
| Main Menu | Animal Selection | Elephant, "Space for Giants" logo, "www.spaceforgiants.org" | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | |
| Main Menu | Animal Selection | Brown Bear, "Chicago Zoological Association" with logo | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | |
| Main Menu | Animal Selection | Jaguar, "ProCarniVoros" logo | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | |

Sindelar 365

| Location | Feature | Icon/Label | Function | Display Info | Position | Interaction | Notes |
|---|---|---|---|---|---|---|---|
| Main Menu | Animal Selection | Rhino, "Ol Pejeta Conservatory" logo | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | |
| Main Menu | Animal Selection | Lemur, Conservation International | Chooses AR Animal | Animal/Org | Center; Option swivels in places (like movement) | Tap | |
| Everywhere except Opening Screen | Back Button | Arrow pointing left | Goes to previous place in app | N/A | Upper left corner | Tap | |
| Main Menu | About Button | City skyline in elephant footprint icon, "About" | Opens About Page in app | N/A | Bottom left corner | Tap | |
| About Page | Scroll About | "About this App Safari Central" | Swipe through five pages of information | N/A | All of Screen | Swipe right or left | |
| Main Menu; About Page | Like Button | Thumb Up, "Like Us!" | Opens Facebook to "Like" Safari Central Page | N/A | Top Right; Bottom middle | Tap | |
| Main Menu; About Page | Open Website | House, "Visit Us!" | Opens Safari Central Website | N/A | Top Right; Bottom middle | Tap | |
| Main Menu | Shop Button | Shopping cart, "Shop" | Opens purchase option | N/A | Bottom right corner | Tap | |
| Store | Purchase Selection | Right and left arrows | Toggles purchase options | Name, Free photos remaining | Middle | Tap | Text: "Shop" , "Top-up your camera, or go unlimited for good!" |
| Store | Refund | Restore Purchases | No effect when used | Screen darkened and "Waiting..." | Bottom right | Tap | This option did not work |

| | | | | appeared | | | |
|---|---|---|---|---|---|---|---|
| Store | Individual Animal Info | "Learn More", Organization logo | Opens individual animal's page | N/A | Bottom left | Tap | |
| Store | Purchase option | Animal, "+5 Photos" | Prompts purchase screen | Provides price or says "Unlocked" | Bottom middle | Tap | Price: 0.99 USD |
| Store | Purchase option | Animal, "∞ Unlimited Photos" | Prompts purchase screen | Provides price or says "Unlocked" | Bottom middle | Tap | Price: 2.99 USD |
| Camera mode | Toggle Camera | Camera with rotation arrow | Toggles front and rear phone cameras | N/A | Bottom left corner | Tap | |
| Before camera opens; "Get Help" in came | Get Help | I icon, "Get some targets" | Opens Safari Central Webpage of targets | Page explains target options | Bottom middle | Tap | Page shows target options (partner logos and "15 types of currency") |
| Before camera opens; "Get Help" in came | Closes Get Help | "Got It!" | Closes Get Help item | Page explains target options | Bottom middle | Tap | |
| After Closing Get Help | Framing Help | "Continue" | Closes Framing Help | Page explains how to game target | Bottom middle | Tap | Text: "Frame the target!" , "Just place your chosen target on a flat surface, point your camera at it, and get it in the frame! |
| After Closing Framing Help | Play Help | "Continue" | Closes Play Help | Page explains how to play with app | Bottom middle | Tap | Text: "Play!" , "When the target is framed… your animals should appear! Tap to play around, and use the camera button to take photos with it |
| Both cameras | Camera Button | Camera Icon | Captures photo | Also displays the remaining photo count | Middle right | Tap | |

Interaction Log:

| Touch Type | Camera Use | Interaction | Notes |
|---|---|---|---|
| **Pangolin** | | | |
| Tap | No | Select Tswalu | |
| Tap | Yes | Trying to get frame to recognize currency | |
| Grip/Pull | No | Straightening out currency ($20) | |
| Tap | Yes | Selecting I need help! | |
| Tap | Yes | Switching cameras | $20 not recognized |
| Tap | Yes | Continue Play | |
| Hold Tap + Pinch | Yes | Rotate Pangolin | Did not work |
| Pinch | Yes | Resize Pangolin | Repeated many times |
| Tap + Drag | Yes | Positioning Pangolin inside room | Only place he would fit is on my shoulder, desk, or shelves; repeated many times |
| Rotating camera | Yes | Trying to get portrait mode | Cannot get portrait mode |
| Rotating camera | Yes | Trying to get better wide angle and avoid fingers in front of camera | |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated several times |
| Tap | No | Back | Didn't want to keep photo; repeated several times |
| Tap | No | Purchase photos | Wanted to take more photos |
| Tap | No | Confirm Purchase | Needed to confirm in Play store |
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Share with us | Facebook login failed |
| Tap | No | Share | App crashed |
| **Elephant** | | | |
| Grip/Pull | No | Straightening out currency ($1) | Currency worked; jungle and elephant sounds play in background |
| Tap | Yes | Trying to resize/position Elephant | Created marker instead |
| Tap +Pinch | Yes | Created marker | Animal moves towards marker; repeated many times |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated several times |
| Tap | No | Back | Didn't want to keep photo; repeated several times |

| | | | |
|---|---|---|---|
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Selected Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Selected Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | Yes | Switching cameras | |
| Tap | Yes | Continue Play | |
| Tap | No | Learn More About Me | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |

Jaguar

| | | | |
|---|---|---|---|
| Placing object | No | Positioning $1 bill | Currency worked; jungle and jaguar sounds play in background |
| Tap | Yes | Created marker | Animal moves towards marker; repeated many times throughout encounter |
| Tap | Yes | Capture photo | |
| Tap | No | Purchase photos | |
| Tap | No | Back | Didn't want to keep photo; repeated several times |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated many several times |
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Selected Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Selected Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | Yes | Switching cameras | |
| Tap | Yes | Continue Play | |
| Pinch | Yes | Resize Animal | Repeated many times |
| Drag | Yes | Position animal | Repeated many times |
| Tap | Yes | Learn More About Me | Opens animals bio in-app and shows two buttons (Support and Learn More)that link to the same place outside of the app |
| Tap | No | Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |

Bear

| | | | |
|---|---|---|---|
| Placing object | No | Positioning $1 bill | Currency worked; jungle and jaguar sounds play in background |
| Tap | Yes | Created marker | Animal moves towards marker; repeated many times throughout encounter |
| Tap | Yes | Capture photo | |

| Tap | No | Purchase photos | |
|-----|-----|-----|-----|
| Tap | No | Back | Didn't want to keep photo; repeated several times |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated many several times |
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Selected Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Selected Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | Yes | Switching cameras | |
| Tap | Yes | Continue Play | |
| Pinch | Yes | Resize Animal | Repeated many times |
| Drag | Yes | Position animal | Repeated many times |
| Tap | Yes | Learn More About Me | Opens animals bio in-app and shows two buttons (Support and Learn More)that link to the same place outside of the app |

| | | | |
|---|---|---|---|
| Tap | No | Support | Navigated to Safari Central's Animal About page; Features all animals, and each |
| Tap | No | Learn More | animal has several tabs; page landed on specific anima |
| Rhino | | | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Placing object | No | Positioning $1 bill | Currency worked; jungle and jaguar sounds play in background |
| Tap | Yes | Created marker | Animal moves towards marker; repeated many times throughout encounter |
| Tap | Yes | Capture photo | |
| Tap | No | Purchase photos | |
| Tap | No | Back | Didn't want to keep photo; repeated several times |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated many several times |
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Selected Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Selected Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | Yes | Switching cameras | |
| Tap | Yes | Continue Play | |
| Pinch | Yes | Resize Animal | Repeated many times |
| Drag | Yes | Position animal | Repeated many times |
| Tap | Yes | Learn More About Me | Opens animals bio in-app and shows two buttons (Support and Learn More)that link to the same place outside of the app |
| Tap | No | Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Lemur | | | |
| Placing object | No | Positioning $1 bill | Currency worked; jungle and jaguar sounds play in background |
| Tap | Yes | Created marker | Animal moves towards marker; repeated many times throughout encounter |
| Tap | Yes | Capture photo | |
| Tap | No | Purchase photos | |
| Tap | No | Back | Didn't want to keep photo; repeated several times |
| Tap | Yes | Capture photo | Trying to capture nice posed picture; repeated many several times |
| Tap | No | Save Photo | Photo saved to phone |
| Tap | No | Selected Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each |

animal has several tabs; page landed on specific anima

| Touch | Haptic | Selection | Details |
|---|---|---|---|
| Tap | No | Selected Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | Yes | Switching cameras | |
| Tap | Yes | Continue Play | |
| Pinch | Yes | Resize Animal | Repeated many times |
| Drag | Yes | Position animal | Repeated many times |
| Tap | Yes | Learn More About Me | Opens animals bio in-app and shows two buttons (Support and Learn More)that link to the same place outside of the app |
| Tap | No | Support | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |
| Tap | No | Learn More | Navigated to Safari Central's Animal About page; Features all animals, and each animal has several tabs; page landed on specific anima |

Gameplay Log:

| Interactive Object/Being | Camera Use | Physical Touch Type | Haptic | Visuality | Details |
|---|---|---|---|---|---|
| Pangolin | Yes | Tap | No | | I tapped the animals to see if they would react, but they are NOT programmed to perform action at a tap. No change in behavior |
| Pangolin | Yes | Tap Hold + Pinch | No | | I performed the action the app instructed to rotate the animals, but there was no change in rotation. |
| World/Pangolin | Yes | Tap | No | | I thought I was touching the animal, but instead I created a marker behind the animal (Pangolin) that it walked to. |
| Camera Button | Yes | Tap | No | | Captured image. Repeated many times for each animal. |
| $1 Bill | Yes | Tap | No | | I touched paper money many times (a $20 bill and then a $1 bill) to repopulate animals into new places. |
| Bear | Yes | Tap | Yes | | Positioning Jaguar on my hand. Required many taps to move bear and myself to align ourselves just right. |
| Jaguar | Yes | N/A | Yes | | Trying to "pet" or position my fingers around the Jaguar. It was very difficult. |
| Jaguar | Yes | Tap | Yes | | I touched the screen many times to create markers and reposition the animals. This was careful posing. |
| Jaguar | Yes | Tap | Yes | | Positioning the jaguar on my hand. Required many taps to move the jaguar and myself to align ourselves just right. |
| Jaguar | Yes | Tap | Yes | | Positioning the jaguar on my shelf. Required minor physical adjustments and imagining that I was looking at something behind me. Repeated several times. |
| Bear | Yes | Tap | Yes | | Giving my dogs requests to sit and stay for a photo with the bear. I was giving commands for the bear to move while giving my real-life animal requests. I felt multisensory feeling by engaging physically with my dog (verbal and sign commands) and while seeing through the screen. |
| Bear | Yes | Tap | Yes | | Positioning the bear behind me. Required many taps to move the bear and practice responsive facial expressions. |
| Bear | Yes | Tap and Pinch | Yes | | Positioning and resizing bear on my hand. Required many taps to move bear and myself to align ourselves just right. My wrist began to hurt from so many attempts. |
| Rhino | Yes | Tap | Yes | | I became comfortable with the app and creating markers, and I accidentally tapped the real Table instead of tapping the screen. (Rhino) |
| Dog/Rhino | Yes | Tap and Pinch | Yes | | Holding my dog while tapping/pinching the screen to move/resize the Rhino. I found myself seeing with the screen and also sensing my surrounding with other interactive begins. |
| Rhino | Yes | Tap | No | | I thought the lemur would walk to the marker but it hopped to it instead. This made the interaction more fun for me because I could interact more quickly. |
| Rhino | Yes | Pinch | Yes | | Resizing rhino on my hand. Required many pinches make as big as possible. Required minor physical adjustments and imagining that I was looking at something near me. Repeated several times. |
| Dog/Lemur | Yes | Tap | Yes | | I became comfortable with the app and creating markers, and I accidently touched the screen to move the dollar bill instead of touching the real object. |
| Lemur | Yes | Tap | Yes | Tap | Giving my dogs requests to sit and stay for a photo with the lemur. I was giving commands for the bear to move while giving my real-life animal requests. I felt multisensory feeling by engaging physically with my dog (verbal and sign commands) and while seeing. Repeated several times through the screen. |
| Lemur | Yes | and Pinch | Yes | | Positioning/resizing lemur on my shoulders and then on my hand. Required many minor adjustments to my posture and the lemur. |
| Lemur | Yes | Tap | Yes | | I became comfortable with the app and creating markers, and I accidentally tapped the shelf Table instead of tapping the screen. |

Appendix C

Wildeverse VR Notes

Object Inventory:

| Object | Details | Effects | Value | Share | Trade |
|---|---|---|---|---|---|
| Leaf Handkerchief | Includes fact about animal use | Always completes mission or adds bonus points, and it may lead to details in chat. | Always provides points for mission | Not applicable in this app | Not applicable in this app |
| ? | | | | | |
| Orangutan Nest | Includes fact about animal use | | | | |
| Orangutan Poo | Includes fact about researcher use | | | | |
| Orangutan Urine | Includes fact about researcher use | | | | |
| ? | | | | | |
| Alulup | Includes fact about plant | | | | |
| Bajakah Balayan | Includes fact about plant and human use | | | | |
| Bajakah Luaa | Includes fact about plant and human use | | | | |
| Lunuk Buhis | Includes fact about plant | | | | |
| Hampuak Galaget | Includes fact about plant | | | | |
| Jangkang Kuning | Includes fact about plant | | | | |
| Kayu Bulan | Includes fact about plant | | | | |
| Kayu Cahang | Includes fact about plant and human use | | | | |
| ? | | | | | |
| Kenari | Includes fact about plant | | | | |
| Malam Malam | Includes fact about plant and specific animal (Fio and Chilli) | | | | |
| Manggis Hutan | Includes fact about plant and human use | | | | |
| Nyatoh Burung | Includes fact about plant | | | | |

|  |  |
|---|---|
|  | and human use |
| Nyatoh Gagas | Includes fact about plant |
| Pisang Pisang Besar | Includes fact about plant and specific animal (Fio) |
| Ponak | Includes fact about plant |
| Termite branch |  |
| Terontang | Includes fact about plant |
| ? |  |
| Air Quality Meter | Includes fact about researcher use |
| Butterfly Trap | Includes fact about researcher use |
| Hornbill Nest | Includes fact about animal use |
| Peat Probe | Includes fact about researcher use |
| Water Level Meter | Includes fact about researcher use |
| Webbing Bridge | Includes fact about plant and animal use |
| Litter | "AKA rubber boots - ideal for walking through peat-swamp forests" |
| Litter | "Used plastic food container - not to be left in forest" |
| Litter | "Used plastic liquid container - not to be left in forest" |
| ? |  |
| Litter | "Casual footwear, ideal for lounging around base camp" |
| Jambu Burung | Includes fact about plant and specific animal (Chilli) |

| | |
|---|---|
| Lunuk Bunyer | Includes fact about plant |
| Lunuk Punai | Includes fact about plant |
| ? | |
| Gibbon Poo | Includes fact about researcher use |
| Rambutan Hutan | Includes fact about plant and human use |
| Katiau | Includes fact about plant and specific animal (Fio) |
| Lilin Lilin | Includes fact about plant and specific animal (Chilli) |
| Jelutong | Includes fact about plant |
| Karinat | Includes fact about plant |
| Papong | Includes fact about plant |
| Botunga | Includes fact about plant and animal use |
| Botunga | Includes fact about plant and human use |
| Mboto | Includes fact about plant and human use |
| Bokoko | Includes fact about plant, human use, and animal use |
| Jolo A | Includes fact about plant |
| Jolo B | Includes fact about plant |
| Fusa | Includes fact about plant and human use |
| Bangi | Includes fact about plant and human use |
| Yonga | Includes fact about plant and human use |
| Bambu | Includes fact about plant and animal use |
| Nguluma | Includes fact about plant and human use |
| Mobel | Includes fact about plant |

| | and human use |
|---|---|
| Mbili | Includes fact about plant and human use |
| Solia | Includes fact about plant and human use |
| Antlaris | Includes fact about plant |
| Ngata | Includes fact about plant and human use |
| Mwase | Includes fact about plant and human use |
| Zanha | Includes fact about plant and human use |
| ? | |
| Kakala | Includes fact about plant and human use |
| Boboko Stem | Includes fact about plant and animal use |
| Tondolo Stem | Includes fact about plant and animal use |
| Bangi Leaves | Includes fact about plant and human use |
| Ngombe Leaves | Includes fact about plant and animal use |
| Termite Mound | Includes fact about plant and animal use |
| Termite Nest | Includes fact about researcher use |
| Satellite Phone | Includes fact about researcher use |

Interface Study:

| Place in App | Interface Items |
|---|---|
| Opening Screen 1 | Internet of Elephants Logo |
| Opening Screen 2 | Dedication |
| Opening Screen 3 | Loading Image |
| Chat | Name, profile pic, XP, Level name and bar, chat log with all characters, dialogue buttons, collect button |

Wildeverse        Animal selection (Fio, Buka, Chilli, Aida). List of missions including completed, active, and locked for each animal. Description of animal (name, species, location)

Journal        You tab, Team tab, Scan Log tab, Fio tab, Buka tab, Chill tab, Aida tab, Credits tab

You tab        About You card

Team tab        The Wildiverse Team card

Scan Log tab        Scan Log card

Fio Tab        Bio Card and Notes Card

Buka Tab        Bio Card and Notes Card

Chili Tab        Bio Card and Notes Card

Aida Tab        Bio Card and Notes Card

After Dialogue        Continue Button

In Wildeverse        Things to Scan, Walking Button, Camera Button, Back Button, LiDAR, Scanner, Scan Button, Warning

| Interface Item | On-Screen Image / Info | Effect | Other Information | Place in App | Place On Screen | Physical Interaction Type | Other |
|---|---|---|---|---|---|---|---|
| Dialogue options | Yellow box(es) with texts | Says dialogue option from 1-3 boxes | Options range Chat | | Bottom Center | Tap | |
| Collect Button | Green, featuring text and a check icon in black | Collects journal entry | Chat | | Bottom Right | Tap | |
| Update Pop-up | Update log from app developers | Close pop-up on tap | Chat | | Scrollable center | Tap + pull | |
| Wildiverse - Fio | Mission cards (name, status, description) | Prompts mission | Wildiverse Tab | | Scrollable center | Tap + pull | |
| Wildiverse - Buka | Mission cards (name, status, description) | Prompts mission | Wildiverse Tab | | Scrollable center | Tap + pull | |
| Wildiverse - Chilli | Mission cards (name, status, description) | Prompts mission | Wildiverse Tab | | Scrollable center | Tap + pull | |
| Wildiverse - Aida | Mission cards (name, status, description) | Prompts mission | Wildiverse Tab | | Scrollable center | Tap + pull | |
| "Enter Wildeverse" | Back text in green box and play | Starts Mission | | | | | |

button

| | | | | | | |
|---|---|---|---|---|---|---|
| Journal Tab - You | Profile pic, name, species, location, XP, Level name and progress bar) | None | Sometimes has ad for associated conservation org  Journal | Center | Tap | |
| Journal Tab - Team | Names, images, roles, locations, and description of characters | None applicable. | Number of locked characters if applicable.  Journal | Scrollable center | Tap + pull | |
| Journal Tab - Scan Log | Names, images, roles, locations, scan count, and description of scanned items | None | Numbers of scans collected out of total  Journal | Scrollable center | Tap + pull | |
| Journal Tab - Fio - Bio Card | Level name and progress bar, image, location on map, name, species, sex, age, location | None | Journal | Center | Tap | |
| Journal Tab - Fio - Notes Card | Notes sent from chat (Facts about individual animal or species, terms defined, and org info) | None total | Number of notes collected out of total  Journal | Center | Tap + pull | No option for entering your own notes. Previously collected in-game photos. |
| Journal Tab - Buka - Bio Card | Level name and progress bar, image, location on map, name, species, sex, age, location | None | Journal | Center | Tap | |
| Journal Tab - Buka - Notes Card | Notes sent from chat (Facts about individual animal or species, terms defined, and org | None total | Number of notes collected out of total  Journal | Center | Tap + pull | No option for entering your own notes. Previously collected in-game photos. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | info) | | | | | |
| Journal Tab - Chilli - Bio Card | Level name and progress bar, image, location on map, name, species, sex, age, location | None | Journal | Center | Tap | |
| Journal Tab - Chilli - Notes Card | Notes sent from chat (Facts about individual animal or species, terms defined, and org info) | None total | Number of notes collected out of Journal | Center | Tap + pull | No option for entering your own notes. Previously collected in-game photos. |
| Journal Tab - Aida - Bio Card | Level name and progress bar, image, location on map, name, species, sex, age, location | None | Journal | Center | Tap | |
| Journal Tab - Aida - Notes Card | Notes sent from chat (Facts about individual animal or species, terms defined, and org info) | None total | Number of notes collected out of Journal | Center | Tap + pull | No option for entering your own notes. Previously collected in-game photos. |
| Journal Tab - Credits | The Animals (featuring pics), Devs, Testers, Researchers, Partner Orgs, Funders (mostly KS) | None | Journal | Scrollable center | Tap + pull | |
| Continue Button | Green, featuring text and a play icon in black | Begins the next stage | After Dialogue | Center | Tap | |
| Accept Button (for terms) | Green, featuring text and a play | Grants permission and begins the next stage | After Dialogue | Center Bottom | Tap | |

| | | | | | |
|---|---|---|---|---|---|
| | icon in black | | | | |
| Accept Button (for mission) | Green, featuring text and a check icon in black | Begins the next stage | After Dialogue | Center Bottom | Tap |
| OK Button | Green, featuring text and a play icon in black | Grants permission and begins the next stage | After Dialogue | Center Bottom | Tap |
| I'm Ready Button | Green, featuring text and a play icon in black | Begins the next stage | Warnings about surrounding and suggests best play space  Before entering Wildiverse | Center Bottom | Tap |
| Ready Button | Green, featuring text and a play icon in black | Begins the next stage | After entering Wildiverse | Center Bottom | Tap |
| Things to Scan | Current Mission Prompt, requirements, and start button | Begins the next stage | Shows optional items to gather too   In Wildiverse | Center | Tap |
| Walking Button | Silhouette of hiking boot | Moves forward | In Wildiverse | Bottom Center | Tap |
| Camera Button | Silhouette of camera | Takes photo | In Wildiverse | Bottom Right | Tap |
| Back Button | Backward play icon in black on orange button | Leaves Wildiverse | In Wildiverse | Bottom Right | Tap |
| LiDAR | Text and scanning rings | No discernable effect | In Wildiverse | Bottom Right | Tap |
| Scan Button | Green, featuring text and a play icon in black | Scans object   When scanning shows progress bar | In Wildiverse | Center | Tap |
| Scanner | Cross hair scope | Shows distance to nearest target (meters), and prompts scan button | In Wildiverse | Center | Tap |
| Keep Playing | Green, featuring text in black | Shows collected objects | When minimum requirements are met but more could be found In Wildiverse | Center | Tap |
| Finish Now | Red, featuring text and a play icon in | Shows collected objects | When minimum requirements are met but | Center | Tap |

| | black | more could be foundIn Wildiverse | | |
|---|---|---|---|---|
| Warning | Static, red overlay, "WARNING Too close to animal", Exclamation mark in a red circles (x2) | Disables other interactivity When too close to certain animals (Gorilla) In Wildiverse | Center | N/A |

Interaction Log:

| Touch Type | Camera Use | Interaction | Details | Notes |
|---|---|---|---|---|
| Fio | | | | |
| N/A | No | Dialogue | A: "Hey! Before we begin I need to know what we should call you!" | |
| Tap | No | Dialogue | Type name | |
| Tap | No | Tap "Continue" Button | | |
| Tap | No | Tap "Accept" Button | Accepted terms of app | |
| N/A | No | Dialogue | A: "Hello kailan!" | |
| N/A | No | Dialogue Button(s) | "Hi" | |
| Tap | No | Choose Dialogue Button | "Hi" | |
| N/A | No | Dialogue | A: "Welcome to Wildiverse [smile emoji]" | |
| N/A | No | Dialogue | A: "It's excellent you're here" | |
| N/A | No | Dialogue | A: "Let's start you off in our first location…" | |
| N/A | No | Dialogue | A: "… a swampy forest on the island of Borneo, in Indonesia [three tree emojis]" | |
| N/A | No | Dialogue | A: "Just visit it in augmented reality, and explore it as if you're really there" | |
| N/A | No | Dialogue | A: "You'll be helping to get our new tech working… and you might even do some science while you're at it!" | |

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | A: "So - get in there, and for your first mission just see if you can find any 'signs' of a very special lady who lives there. (Hint: [poop emoji]" | |
| Tap | No | Select Wildiverse Tab | | |
| Tap | No | Accept Mission | Move to Next Stage | |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | OK Button | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| N/A | Yes | Dialogue | A: "TIP: Walk around the holographic forest to find the things you need to scan" | |
| N/A | Yes | Dialogue | A: "TIP: Tap an object to mark it" | Didn't notice until taking notes |
| N/A | Yes | Dialogue | A: "TIP: To scan the object, get closer by walking… or by using the button below." | |
| N/A | Yes | Dialogue | A: "TIP: Tap the 'SCAN' button to scan the object." | |
| N/A | Yes | Dialogue | A: "TIP: To scan the object, get closer by walking… or by using the button below." | |
| N/A | Yes | Find nearest target | Walk around inside | |
| Tap | Yes | Unknown Object | Prompts scan option | |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Orangutan Poo |
| N/A | Yes | Dialogue | A: "TIP: Keep the target in your sights whilst scanning" |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "FANTASTIC" |
| Tap | No | Dialogue | "Thanks!" |
| N/A | No | Dialogue | A: "You did it [two poop emojis]..." |
| N/A | No | Dialogue | A: "and Wildiverse seems to be doing its job" |
| N/A | No | Dialogue | A: "Which is good because I'm sort of in charge [sweat smiley face]" |
| N/A | No | Dialogue | A: "We built it to beam real wild places to anywhere in the world - so people like you can help with our research" |
| N/A | No | Dialogue | A: "Your XP score up there [three red triangles] tells us how well you're doing" |
| N/A | No | Dialogue | E: "and we can learn loads by analyzing things like the animal [poop] you just scanned" |
| N/A | No | Dialogue | E: "we can see that the sample belonged to Fio!" |
| N/A | No | Dialogue | E: "an awesome orangutan who lives right here in Borneo" |
| N/A | No | Dialogue | A: "kailan, meet Eka! One of our wildlife conservationists on the ground" |
| N/A | No | Dialogue | E: "[clap emoji] from Sebangau National Park in Borneo!" |
| N/A | No | Dialogue | A: "Eka's working with the Borneo Nature Foundation..." |
| N/A | No | Dialogue | A: "Protecting Borneo's forests and animals who live in them" |
| N/A | No | Dialogue | A: "All through research and science" |
| N/A | No | Dialogue | E: "all true!" |
| N/A | No | Dialogue | A: "I was there a few years ago - but now I'm back at Wildiverse HQ, here in Kenya [smile emoji]" |
| N/A | No | Dialogue | E: "we miss you!" |

Sindelar 383

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "so kailan! what brings you to Wildiverse?" |
| N/A | No | Dialogue Button(s) | "I love the idea of virtual pets" ; "Anything to do with animals, I'm in" ; "I am an early-adopting tech vulture" |
| Tap | No | Choose Dialogue Button | "Anything to do with animals, I'm in |
| N/A | No | Dialogue | E: "well I think we're going to get along frankly [smile emoji]" |
| N/A | No | Dialogue | E: "do you know much about wildlife?" |
| N/A | No | Dialogue Button(s) | "Yes! I love wildlife and even get involved in conservation" ; "A bit… I like animals, but don't know much about them" ; "Not really. But I like a good adventure" |
| Tap | No | Choose Dialogue Button | "A bit… I like animals, but don't know much about them" |
| N/A | No | Dialogue | E: "who doesn't like animals, right?" |
| N/A | No | Dialogue | E: "but there's work being done all the time to learn about them and keep them safe" |
| N/A | No | Dialogue | A: "Yep - so it's great to have you on board kailan" |
| N/A | No | Dialogue | E: "sooo here's some data on Fio for your journal: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "basically… she's female about 8 years old, and just getting independent from her mum" |
| N/A | No | Dialogue | E: "and she likes fruit and sleeping (who doesn't) [bed emoji] |
| N/A | No | Dialogue | E: "we want you to enter Wildiverse again and find some of Fio's lunchtime leftovers for me! |
| N/A | No | Dialogue | E: "and Fio will be there too, so make sure you get a scan of her as well" |
| N/A | No | Dialogue | E: "she'll be somewhere in the trees above you - look up!" |
| N/A | No | Dialogue | A: "In fact kailan it's important to get regular scans of all the animals in the Wildiverse" |
| N/A | No | Dialogue | A: "so keep an eye on your mission and you'll see when you need them" |
| N/A | No | Dialogue | E: "yup! So - scan some lunchtime leftovers and Fio please! Accept?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready | Move to Next Stage |

| | | Button | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| N/A | Yes | Dialogue | A: "TIP: Use LiDAR to help find objects" | Arrows points down at LiDAR button. I don't notice but press at a later point with no discernable effect |

| | | | |
|---|---|---|---|
| N/A | Yes | Find nearest target | Walk around inside few seconds | When I look up, the holographic forest often freezes for a |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Unknown Object | Prompts scan option |
| Tap | Yes | Scan Button | Lunik Buhis |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | Yes | Dialogue | E: "MISSION COMPLETE! Nice one kailan [sunglasses emoji]" |
| N/A | No | Choose Dialogue Button | "You are very welcome, Eka" |
| N/A | Yes | Dialogue | E: "brilliant scan of Fio and one of her favorite lunchtime meals" |
| N/A | Yes | Dialogue | E: "so… what do you think so far?" |
| N/A | No | Dialogue Button(s) | "Very special - show me more!" ; So… am I a scientist now?" ; "When do we start feeding Fio?" |
| Tap | No | Choose Dialogue Button | "So… am I scientist now?" |
| N/A | Yes | Dialogue | E: "I'm voting yes, tbqh, and welcome aboard ha ha! [tree emoji]" |
| N/A | Yes | Dialogue | E: "srsly, you never forget the first wild orang you meet, it's special" |
| N/A | Yes | Dialogue | E: "let's try another easy mission. Fio's going to be doing some snacking anytime now - and I want to see what she's eating" |
| N/A | Yes | Dialogue | E: "and don't forget to scan her as well details in the mission" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |

| | | | |
|------|------|------------------|-------------------------------------------------------|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Ponak |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Ponak |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Ponak |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey" |
| N/A | No | Dialogue Button(s) | "hey" |
| Tap | No | Choose Dialogue | "hey" |

| | | Button | |
|---|---|---|---|
| N/A | No | Dialogue | A: "hey [smile emoji]" |
| N/A | No | Dialogue | E: "you're a natural at orang tracking [two thumbs up emojis]" |
| N/A | No | Dialogue | E: "we've been following Fio's family for years, learning about them..." |
| N/A | No | Dialogue | A: "Fio literally grew up with one of us around" |
| N/A | No | Dialogue | A: "She's pretty used to people now" |
| N/A | No | Dialogue | E: "her mum Feb used to throw fruit at me years ago" |
| N/A | No | Dialogue | E: "here's a note for your journal about her family tree" |
| N/A | No | Dialogue | A: "I've still got a photo of that pinned to our notice board" |
| N/A | No | Dialogue | A: "Have you been taking any photos inside Wildiverse?" |
| N/A | No | Dialogue Button(s) | "No" ; "Not yet…" ; "Yes" |
| Tap | No | Choose Dialogue Button | "Yes" |
| N/A | No | Dialogue | A: "We take loads out in the wild all the time" |
| N/A | No | Dialogue | E: "good for raising money for our work out here [money bag emoji and shhh emoji]" |
| N/A | No | Dialogue | A: "Borderline cynical but that is why we love you, Eka" |
| N/A | No | Dialogue | E: "You know it's true ha ha!" |
| N/A | No | Dialogue | A: "Well we have to prove things live here if we want the cash to protect them..." |
| N/A | No | Dialogue | A: "Anyway… back to fruit" |
| N/A | No | Dialogue | A: "It's time to get out and find some more" |
| N/A | No | Dialogue | A: "If you can scan four different fruits that should do it" |
| N/A | No | Dialogue Button(s) | "Fruit? Again? Why do you need more fruit?" ; "This is beginning to sound like an '80's arcade game but OK" |
| Tap | No | Choose Dialogue Button | "This is beginning to sound like an '80's arcade game but OK" |
| N/A | No | Dialogue | E: "I see what you did there [ghost emoji]" |
| N/A | No | Dialogue | E: "we do spend a lot of time collecting samples" |
| N/A | No | Dialogue | E: "and clearly… variety matters!" |
| N/A | No | Dialogue | E: "see you when you've scanned three more fruits!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse | |

|  |  | Tab |  |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Lunuk Buhis |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Nyatoh Burung |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Jangkang Kuning |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "well, that's a lot of food" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "I know!" |
| Tap | No | Choose Dialogue Button | "I know!" |
| N/A | No | Dialogue | E: "there's a fruit here that doesn't grow anywhere else in the world, things I'd never even heard of… 70% of fio's diet is fruit" |
| N/A | No | Dialogue | E: "anyway - how are you finding life in Sim-donesia? Ha ha [tongue out face]" |
| N/A | No | Dialogue Button(s) | "So… if I'm a scientist now, am I doing enough?" ; "So… where can I buy a frothy coffee in the forest" |
| Tap | No | Choose Dialogue Button | "So… if I'm a scientist now, am I doing enough?" |
| N/A | No | Dialogue | E: "yeah… we just do what we can! Doing anything at all is good -" |
| N/A | No | Dialogue | E: "and you're def doing something - getting to know Fio, learning how our work is done [clap emoji]" |
| N/A | No | Dialogue | E: "anyway, ready to get back in there? We don't just spend all day picking up half eaten food you know - there's other stuff too" |
| N/A | No | Dialogue | E: "and right now… I need you to identify something wildiverse can't identify… probably because it's up in the trees" |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan Poo |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan Nest |
| Tap | Yes | Continue Button | Shows summary of scanned objects |

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "you did it! high five [hands emoji]" |
| N/A | No | Dialogue Button(s) | "Thanks!" |
| Tap | No | Choose Dialogue Button | "Thanks!" |
| N/A | No | Dialogue | A: "That was a high ten Eka [kiss emoji]" |
| N/A | No | Dialogue | E: "[smile emoji] and kailan - looks like that was one of Fio's nests!" |
| N/A | No | Dialogue Button(s) | "'Nest'? Are we orang-o'tangs birds then?" ; "I've forgotten how to spel 'orangeutange'" |
| Tap | No | Choose Dialogue Button | "'Nest'? Are we orang-o'tangs birds then?" |
| N/A | No | Dialogue | E: "er, no! ha ha. Orangutans are apes, but we call their beds 'nests'" |
| N/A | No | Dialogue | E: "orangutans learn to make them from their mothers: " |
| N/A | No | Dialogue | E: "pillow, blanket, mattress, all out of branches and leaves [bed emoji]" |
| N/A | No | Dialogue | E: "make a new one every night and leave it in the morning, so if your see a nest you know an orangutan's been there" |
| N/A | No | Dialogue | A: " kailan I've got a note for your journal about it, check it out" |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "And let's get you back into Wildiverse" |
| N/A | No | Dialogue | A: "Not sure whether Fio's around…but we're receiving some new things to find and scan" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |

| | | | |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Terontang |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Kenari |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey, nice job out there!" |
| N/A | No | Dialogue Button(s) | "Thank you Eka" |
| Tap | No | Choose Dialogue Button | "Thank you Eka" |
| N/A | No | Dialogue | E: "We're seeing some pretty typical orangutan action… here's a note about it: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "basically, they're up at 6am for fruit breakfast [banana emoji lemon emoji cherry emoji]" |
| N/A | No | Dialogue | E: "then out looking for ([can emoji] snacking en route)" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "a nap after lunch in a new nest [Zs emoji]" |
| N/A | No | Dialogue | E: "then make another nest at bedtime, before sunset! |
| N/A | No | Dialogue | E: "we know this because we follow them from the moment they wake until their bedtime.. every day [sweating smile emoji]" |
| N/A | No | Dialogue Button(s) | "Doesn't Fio mind you being in her space all the time?" ; "Seems like a lot of work!" ; "I wish I could spend my entire day following wild animals" |
| Tap | No | Choose Dialogue Button | "I wish I could spend my entire day following wild animals" |
| N/A | No | Dialogue | E: "follow your dreams, kailan I did and now look I'm literally in an apy swamp" |
| N/A | No | Dialogue | E: "it is hard work, but it's really the best way to study and protect them" |
| N/A | No | Dialogue | E: "you know Fio's mum Feb was one of the first we studied here. Took her quite a while to get used to us! |
| N/A | No | Dialogue | E: "and until she did, she was throwing fruit at us all the time |
| N/A | No | Dialogue | E: "we call it habituation' here's a note about it: |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "anyway - time to get back in there" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Pisang Pisang Bisar |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Pisang Pisang Bisar |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Pisang Pisang Bisar |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey kailan" |
| N/A | No | Dialogue Button(s) | "Hi Eka" |

| | | | |
|---|---|---|---|
| Tap | No | Choose Dialogue Button | "Hi Eka" |
| N/A | No | Dialogue | E: "'Pisang-pisang besar' literally means 'banana-banana big' in our language…" |
| N/A | No | Dialogue | E: "not because the fruit has anything to do with bananas - the tree's branches just look like bananas! |
| N/A | No | Dialogue | E: "pity, because orangutans love [three banana emojis] |
| N/A | No | Dialogue | E: "anyway! Fio's really covering a lot of ground for a female orangutan..!" |
| N/A | No | Dialogue | E: "usually only males travel over such large areas… makes them difficult to study" |
| N/A | No | Dialogue | E: "we know a lot more about Fio's mum, Feb, than we do about her dad… we don't even know who the dad is!" |
| N/A | No | Dialogue | A: "When we've got the DNA scanning working we'll be able to find out who it is. Maybe" |
| N/A | No | Dialogue | A: "And in other news kailan, I want you to meet someone" |
| N/A | No | Dialogue | A: "My friend Johannes, the Field Coordinator for Chester Zoo" |
| N/A | No | Dialogue | A: "He's been nagging me to see Wildiverse working, so… OK, Johannes, Field Coordinator of Chester Zoo, meet kailan |
| N/A | No | Dialogue | J: "kailan, JOLLY pleased to meet you!" |
| N/A | No | Dialogue Button(s) | "Hello Johannes" |
| Tap | No | Choose Dialogue Button | "Hello Johannes" |
| N/A | No | Dialogue | E: "chester zoo helps fund our work here at the borneo nature foundation, so be very nice lol" |
| N/A | No | Dialogue | J: "I'm stuck at my desk here in the UK most of the year. So I want to see this working! |
| N/A | No | Dialogue | J: "As a field Coordinator I coordinate the work of our researchers and conservationists in the field..." |
| N/A | No | Dialogue | A: "kailan - here is a note for your journal to explain what a field coordinator is…" |
| Tap | No | Collect Button | Journal Entry |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | J: "Sorry yeah, I can go on a bit. As Amyra knows no doubt" |
| N/A | No | Dialogue | J: "But hey I want to check something kailan… everyone has different opinions of zoos. What do you think about them?" |
| N/A | No | Dialogue Button(s) | "Keeping animals caged up is cruel… Free Willy!" ; "They're OK if the animals are happy and zoos help protect them" ; "I love zoos - they're fun and interesting!" |
| Tap | No | Choose Dialogue Button | "They're OK if the animals are happy and zoos help protect them" |
| N/A | No | Dialogue | J: "Indeed, and not all zoos are created equal" |
| N/A | No | Dialogue | J: "So it's important to support accredited zoos and find out what conservation work they do" |
| N/A | No | Dialogue | J: "Let's see if we can find some of our Borneo work in Wildiverse" |
| N/A | No | Dialogue | J: "But first…." |
| N/A | No | Dialogue | J: "Could you find Fio and some of her poop so I can see how this tech works?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Back Button | Camera is frozen so I back out |
| Move Arm | Yes | Enter Wildiverse | Move to Next Stage |

| | | Button | |
|---|---|---|---|
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan Poo |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan Poo |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Kayu Bulan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Kayu Bulan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan Poo |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "you have a gift for collecting dung. that is a cold stone fact" |
| N/A | No | Dialogue Button(s) | "I'll take that as a compliment" |
| Tap | No | Choose Dialogue Button | "I'll take that as a compliment" |
| N/A | No | Dialogue | J: "Wildiverse is going to be REALLY useful." |
| N/A | No | Dialogue | J: "A tool for visiting hard-to-reach places. Wow." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "How? Useful to a zoo?" |
| Tap | No | Choose Dialogue Button | "How? Useful to a zoo?" |
| N/A | No | Dialogue | J: "WELL. What do you think zoos are for these days kailan?" |
| N/A | No | Dialogue Button(s) | "They're places where we can stop species from going extinct." ; "They're places where desperate parents take their kids." ; "They're evil prisons for animals and must be eradicated." |
| Tap | No | Choose Dialogue Button | "They're evil prisons for animals and must be eradicated." |
| N/A | No | Dialogue | J: "OK. I hear where you're coming from and get it." |
| N/A | No | Dialogue | J: "But conservation is a science. And a lot of that science is done at institutions like ours." |
| N/A | No | Dialogue | A: "kailan maybe you'll get a better picture after hanging out in Wildiverse" |
| N/A | No | Dialogue | E: "[two distressed face emojis] AND THINK OF MY FUNDING! |
| N/A | No | Dialogue | J: "Ok, I think I can show you something interesting now." |
| N/A | No | Dialogue | J: "If I'm right, you're near an area we had some test projects" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to | |

|       |     | Scan                  |                                  |
|-------|-----|-----------------------|----------------------------------|
| N/A   | Yes | Find nearest target   | Walk around inside               |
| Tap   | Yes | Scan Button           | Malam malam                      |
| N/A   | Yes | Find nearest target   | Walk around inside               |
| Tap   | Yes | Scan Button           | Webbing Bridge                   |
| Tap   | Yes | Finish Now Button     | Shows summary of scanned objects |

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "OK - So what has kailan just found?" |
| N/A | No | Dialogue | J: "It's an old webbing bridge! For orangutans!" |
| N/A | No | Dialogue Button(s) | "I need more information here" |
| Tap | No | Choose Dialogue Button | "I need more information here" |
| N/A | No | Dialogue | E: "ok so when the big old trees on the banks of the rivers are gone (long story)" |
| N/A | No | Dialogue | E: "orangutans can't cross the water… they can't access the entire forest" |
| N/A | No | Dialogue | E: "which means they can't socialize, seek food sources…" |
| N/A | No | Dialogue | J: "SO we designed and tested a solution at Chester's Zoo - to hang across rivers." |
| N/A | No | Dialogue | J: "And now it's in the real FOREST" |
| N/A | No | Dialogue | E: "our orangutans started using the bridges almost instantly" |
| N/A | No | Dialogue | E: "expanded their range overnight |
| N/A | No | Dialogue | J: "Yep. It's easier to test VITAL solutions in a zoo." |
| N/A | No | Dialogue | J: "A zoo isn't a wild place. BUT we can help the wild." |
| N/A | No | Dialogue | J: "This one however looks like it's in need of repair… it shouldn't be on the ground like that!" |
| N/A | No | Dialogue | J: "Thanks for finding it kailan. Eka can you get someone to fix it?" |
| N/A | No | Dialogue | E: "of course! [smile face emoji]" |
| N/A | No | Dialogue | J: "And kailan can you go out and check the condition of our 'designer nests'?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter | Move to Next Stage |

| | | | | |
|---|---|---|---|---|
| Tap | No | Wildiverse I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| N/A | Yes | Find nearest target | Walk around inside | |
| Tap | Yes | Scan Button | Orangutan nest | |
| N/A | Yes | Find nearest target | Walk around inside | |
| Tap | Yes | Scan Button | Hornbill nest | |
| Tap | Yes | Continue Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | A: "Everybody meet kailan. Nest Finder in Chief!" | |
| N/A | No | Dialogue Button(s) | "OK can someone explain please" | |
| Tap | No | Choose Dialogue Button | "OK can someone explain please" | |
| N/A | No | Dialogue | J: "The artificial hornbill's nest you found was designed at Chester Zoos!" | |
| N/A | No | Dialogue | E: "hornbills need mature trees to nest in [bird | |

| | | | |
|---|---|---|---|
| | | | emoji]" |
| N/A | No | Dialogue | E: "but old trees can be hard to find these days (again, long story)" |
| N/A | No | Dialogue | E: "enter Johannes and Chester Zoo!" |
| N/A | No | Dialogue | J: "We've been prototyping artificial nests for hornbills" |
| N/A | No | Dialogue | J: "and we're going to keep testing them, improving them" |
| N/A | No | Dialogue | J: "This one looks in pretty good shape! |
| N/A | No | Dialogue | E: "hopefully before long there'll be trees old enough for hornbill nests..." |
| N/A | No | Dialogue | J: "Did you know that zoos did conservation work like this?" |
| N/A | No | Dialogue Button(s) | "Yes, of course" ; "Totally, mm hm" ; "Are you joking? 'Zoo' is my middle name" |
| N/A | No | Choose Dialogue Button | "Totally, mm hm" |
| N/A | No | Dialogue | J: "Indeed!" |
| N/A | No | Dialogue | J: "kailan things like the bridges and nests in Borneo we research and design at home in Chester/" |
| N/A | No | Dialogue | J: "Other conservation projects we just send money to." |
| N/A | No | Dialogue | J: "We're doing research and conservation work in 30 countries." |
| N/A | No | Dialogue | J: "Take a look at https://www.chesterzoo.org/" |
| N/A | No | Dialogue | J: "Read all about it, basically!" |
| N/A | No | Dialogue | J: "But now, I'm getting back to my desk! Sniff." |
| N/A | No | Dialogue | E: "Probably a good time to say thanks for the last grant Johannes [hand up emoji hands clapping emoji]" |
| N/A | No | Dialogue | A: "We literally couldn't do what we do without the help from orgs like yours" |
| N/A | No | Dialogue Button(s) | "I'm glad that all that ice cream money is going to good causes" |
| N/A | No | Choose Dialogue | "I'm glad that all that ice cream money is going to good causes" |

| | | Button | |
|---|---|---|---|
| N/A | No | Dialogue | J: "I'm looking forward to the next project!" |
| N/A | No | Dialogue | J: "Bye bye!" |
| N/A | No | Dialogue | E: "hey guys - while we've been chatting I noticed something really odd in the data" |
| N/A | No | Dialogue | E: "fio made like 4 minutes of long throaty calls" |
| N/A | No | Dialogue | A: "Four minutes? Unusual for female orangs, right?" |
| N/A | No | Dialogue | E: "yeah exactly [thinking emoji]" |
| N/A | No | Dialogue | A: "Anyway -kailan- our Wildiverse satellites are getting better all the time now - and we're picking some more types of things for you to find" |
| N/A | No | Dialogue | A: "Now that Johannes has gone get in there, check in on Fio, and help us Figure out what the new items are" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Jelutong |
| N/A | Yes | Find nearest target | Walk around inside |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Jelutong |
| N/A | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Termite Branch |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey!" |
| N/A | No | Dialogue Button(s) | "Oh hello there, Eka" |
| N/A | No | Choose Dialogue Button | "Oh hello there, Eka" |
| N/A | No | Dialogue | A: "you found Fio… and a termite branch!" |
| N/A | No | Dialogue | E: "orangutan snack [four ant emojis]" |
| N/A | No | Dialogue | E: "a rotten branch of termites" |
| N/A | No | Dialogue | E: "fio sucks them out [ant emoji, fork and knife emoji, drink with straw emoji] |
| N/A | No | Dialogue Button(s) | "Sounds, tasty" |
| N/A | No | Choose Dialogue Button | "Sounds, tasty" |
| N/A | No | Dialogue | A: "I remember when I saw Feb teaching Fio how to do that" |
| N/A | No | Dialogue | A: "Feb's her mum, remember?" |
| N/A | No | Dialogue | A: "Here's a note on that: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "I love Feb" |
| N/A | No | Dialogue | E: "though I don't think the love was mutual to begin with" |
| N/A | No | Dialogue | E: "she peed on me once from Ponak tree when trying to collect a sample [tongue out emoji] |
| N/A | No | Dialogue Button(s) | "A pee sample? Why were you collecting ape pee?" ; "What's it like being peed on by an orangutan?" |
| N/A | No | Choose Dialogue Button | "What's it like being peed on by an orangutan?" |
| N/A | No | Dialogue | E: "everyone just runs" |
| N/A | No | Dialogue | E: "sucks getting peed on at 6 am but you laugh about it later" |
| N/A | No | Dialogue | E: "Well, everyone else does" |
| N/A | No | Dialogue | E: "it's the price we sometimes pay to get a pee sample…. So we |

| | | | can check her health, stress or if she's pregnant" |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "I want to go back in" |
| N/A | No | Choose Dialogue Button | "I want to go back in" |
| N/A | No | Dialogue Button(s) | "With a hat" |
| N/A | No | Choose Dialogue Button | "With a hat" |
| N/A | No | Dialogue | E: "Ha. OK. Here's what you can do now. Details in the mission: " |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan urine |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | target | |
|---|---|---|---|
| Tap | Yes | Scan Button | Leaf Handkerchief |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "cool!" |
| N/A | No | Dialogue | E: "you just scanned one of Fio's leaf handkerchiefs" |
| N/A | No | Dialogue Button(s) | "Explain why Fio has a handkerchief" |
| N/A | No | Choose Dialogue Button | "Explain why Fio has a handkerchief" |
| N/A | No | Dialogue | E: "well, I can't for sure" |
| N/A | No | Dialogue | E: "but we've seen orangutans wipe their faces with leaves..." |
| N/A | No | Dialogue | E: "maybe to clean their eyes and noses, or to cool down?" |
| N/A | No | Dialogue | E: "they use a lot of tools, just like us - here's some info: " |
| N/A | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "Guys - there's something weird about the DNA from that pee sample" |
| N/A | No | Dialogue | A: "don't know if it's just Wildiverse playing up or what" |
| N/A | No | Dialogue | A: "can we get some, um… 'special samples' to cross-check? [wink emoji]" |
| N/A | No | Dialogue | E: "[cry laugh emoji] Sure!" |
| N/A | No | Dialogue | E: "kailan… I've got a [hug emoji] REALLY GOOD MISSION [hug emoji] for you [laugh cry emoji]" |
| N/A | No | Dialogue | E: "..." |
| N/A | No | Dialogue | E: "we need some orangutan poo [poop emoji] some urine samples [umbrella emoji] - and lots of it" |
| N/A | No | Dialogue | E: "to work out what's up with all the weird DNA data Amyra's seeing..." |
| N/A | No | Dialogue | E: "are you up for collecting?" |
| N/A | No | Dialogue Button(s) | "Um. I'm not massive on ape [poop emoji]. Convince me" ; "Yes. I have always wanted to hunt ape [poop emoji] in a forest" ; "No. I refuse the task of collecting ape [poop emoji]" |
| N/A | No | Choose | "Um. I'm not massive on ape [poop emoji]. Convince me" |

| | | | |
|---|---|---|---|
| | | Dialogue Button | |
| N/A | No | Dialogue | E: "dung is great. all I can say is trust me. Two samples of each should be more than enough" |
| N/A | No | Dialogue | E: "I'll also get into the jungle here to find some samples myself, just to double check it's all working properly" |
| N/A | No | Dialogue Button(s) | "ALL RIGHT THEN I'M GOING IN TO GET YOUR [poop emoji]" |
| N/A | No | Choose Dialogue Button | "ALL RIGHT THEN I'M GOING IN TO GET YOUR [poop emoji]" |
| N/A | No | Dialogue | E: "Excellent - details in the mission - and don't forget your hat" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lunuk Punai |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lunuk Punai |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

|     |     |                      |                                          |
| --- | --- | -------------------- | ---------------------------------------- |
|     |     | target               |                                          |
| Tap | Yes | Scan Button          | Lunuk Punai                              |
| Tap | Yes | Find nearest target  | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Orangutan Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Urine |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Urine |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey - how you getting on with the dung collecting? [poop emoji]" |
| N/A | No | Dialogue Button(s) | "It's awesome" ; "It's fantastic" ; "It's completely wonderful" |
| N/A | No | Choose Dialogue Button | "It's awesome" |
| N/A | No | Dialogue | E: "ha ha [cry laugh emoji]" |
| N/A | No | Dialogue | E: "You're doing great!" |
| N/A | No | Dialogue | E: "I first came here because I wanted to track apes - didn't realize quite how much [poop emoji] I'd be handling" |
| N/A | No | Dialogue | E: "I'm now doing work protecting the whole forest ecology" |
| N/A | No | Dialogue | E: "… tho I still go out collecting [poop emoji]" |
| N/A | No | Dialogue | E: "I kind of make a game out of it!" |
| N/A | No | Dialogue | E: "And from your scans we can tell fio's healthy, not too stressed, not pregnancy [hands up emoji] - which matches exactly what I'm seeing in the samples I found [OK emoji]" |
| N/A | No | Dialogue | A:Er. That's not all we can tell" |
| N/A | No | Dialogue | A: "The Wildiverse DNA analysis suggests that Fio's not a female. Fio's a boy. There's no doubt [male sign emoji]" |
| N/A | No | Dialogue | E: "[thinking emoji]" |
| N/A | No | Dialogue | E: "I KNEW IT! I thought the real samples must be contaminated |

| | | | | |
|---|---|---|---|---|
| | | | or something" | |
| N/A | No | Dialogue | E: "totally explains what I've seen - and all her weird behavior!" | |
| N/A | No | Dialogue | E: "*his" | |
| N/A | No | Dialogue | E: "and no wonder the pregnancy test was negative" | |
| N/A | No | Dialogue | E: "[laugh cry emoji] (this is me in real life right now" | |
| N/A | No | Dialogue | E: "*Amyra - Wildiverse is really amazing! | |
| N/A | No | Dialogue | A: "smile blush emoji" | |
| N/A | No | Dialogue | E: "what does this mean for fio? Shall we change her name? | |
| N/A | No | Dialogue Button(s) | "Fio is a great name for a boy" ; "Change it to <PLAYERNAME>" | |
| N/A | No | Choose Dialogue Button | "Fio is a great name for a boy" | |
| N/A | No | Dialogue | E: "I agree! Fio's a great name" | |
| N/A | No | Dialogue | A: "OK, done. I've updated your journal kailan." | |
| N/A | No | Dialogue | A: "Anyway enough of all this excitement" | |
| N/A | No | Dialogue | A: "Wildiverse is picking up some mysterious items… can you have a look and check up on Fio while you're there?" | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Tap | Yes | Scan Button | Orangutan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Litter - Plastic Bottles |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Back Button | Camera Froze |
| Tap | No | Select Wildiverse Tab | Camera froze; restarting. |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Bottles |
| Tap | No | Select Wildiverse Tab | App froze; restarting. |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |

Sindelar 412

| | | | |
|---|---|---|---|
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Bottles |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Boot |
| Tap | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Walk around inside |
| Tap | Yes | Scan Button | Orangutan |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Hey" |
| N/A | No | Dialogue Button(s) | "Hi Amyra" |
| N/A | No | Choose Dialogue Button | "Hi Amyra" |
| N/A | No | Dialogue | E: "[wave emoji] Amyra" |
| N/A | No | Dialogue | A: "Eka, kailan just scanned a load of rubbish in there. Are you seeing that yourself?" |
| N/A | No | Dialogue | E: "yeah…hunters? [shrug emoji]" |
| N/A | No | Dialogue | E: "Remember when we first got here, seeing hunters walk through base camp with all those fruit bats just hanging from a stick? [sad face emoji]" |
| N/A | No | Dialogue | A: "[sad face emoji] At least there's less of that these days" |
| N/A | No | Dialogue | E: "[straight face emoji] yeah" |

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | E: "one good thing about having us in the forest…just our presence is good for stopping a lot of this" | |
| N/A | No | Dialogue | A: "Something's different" | |
| N/A | No | Dialogue | A: "Eka, you're using capital letters and punctuation" | This is weird because she wasn't |
| N/A | No | Dialogue | E: "I was trying to pick up some rubbish and fell into a canal. Lost my phone. So now I'm at basecamp on my computer. With autocorrect turned on." | |
| N/A | No | Dialogue | A: "I lost count of the phones I lost when I was in Borneo" | |
| N/A | No | Dialogue Button(s) | "Canals? In a forest? Er… why?" | |
| N/A | No | Choose Dialogue Button | "Canals? In a forest? Er… why?" | This also felt weird because I (and probably not others) would think or know that forests don't have canals. |
| N/A | No | Dialogue | E: "Good question." | |
| N/A | No | Dialogue | E: "People used to cut trees down for cash[angry face emoji]" | |
| N/A | No | Dialogue | E: "They dug canals to float the wood out of the forest..." | |
| N/A | No | Dialogue | E: "Orangutans need trees, so yeah that was an issue." | |
| N/A | No | Dialogue Button(s) | "I'm going back in. With my phone in a plastic bag" | |
| N/A | No | Choose Dialogue Button | "I'm going back in. With my phone in a plastic bag" | This also felt weird because I haven't been given a mission AND there is no actual water for me. |
| N/A | No | Dialogue | A: "OK! And speaking of canals, try to get some water level readings when you're in there" | |
| Tap | No | Accept Mission | Move to Next Stage | |
| Tap | No | Select Wildiverse Tab | | |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |

| | | | | |
|---|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Kayu Cahang | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Kayu Cahang | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Water Level Meter | |
| Tap | Yes | Continue Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | A: "Hi" | |
| N/A | No | Dialogue Button(s) | "What is up Amyra" | |
| N/A | No | Choose Dialogue Button | "What is up Amyra" | Awkward |
| N/A | No | Dialogue | A: "Well, for you, probably an orangutan" | |
| N/A | No | Dialogue | A: "But - the water level readings are looking to be really useful" | |
| N/A | No | Dialogue Button(s) | "Thanks" | |
| N/A | No | Choose Dialogue Button | "Thanks" | |
| N/A | No | Dialogue | "Actually, why do we need water level readings?" | |

| | | Button(s) | |
|---|---|---|---|
| N/A | No | Choose Dialogue Button | "Actually, why do we need water level readings?" |
| N/A | No | Dialogue | E: "long answer, this forest is a "peat-swamp forest": " |
| N/A | No | Dialogue | E: "all the trees grow in very wet soil made from thousands of years of plants… often underwater" |
| N/A | No | Dialogue | E: "wet coal, basically" |
| N/A | No | Dialogue | E: "so if the peat ever dries out, it burns really easily" |
| N/A | No | Dialogue | E: "which all means we need to keep an eye on the water levels" |
| N/A | No | Dialogue | E: "I've added a note to your journal about it: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "Eka - you've got a new phone I see" |
| N/A | No | Dialogue | E: "is it that obvious? [skeptical face emoji] |
| N/A | No | Dialogue | E: "kailan Wildiverse is now picking up even more food - can you get in and find some samples for me?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | | target |
|---|---|---|---|
| Tap | Yes | Scan Button | Alulup |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Manggis Hutan |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Nyatoh Gagas |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey, good work kailan" |
| N/A | No | Dialogue Button(s) | "thanks Eka" |
| N/A | No | Choose Dialogue Button | "thanks Eka" |
| N/A | No | Dialogue | E: "some haze in the air today here" |
| N/A | No | Dialogue | A: "not in Wildiverse!" |
| N/A | No | Dialogue | E: "because you've not built that feature yet Amyra? [kiss face emoji] |
| N/A | No | Dialogue | E: "[blush smile emoji]" |
| N/A | No | Dialogue Button(s) | "'haze'?" |
| N/A | No | Choose Dialogue Button | "'haze'?" |
| N/A | No | Dialogue | E: "smoke from fires" |
| N/A | No | Dialogue | E: "farmers nearby make little fires to clear the weeds, which sometimes grow into bigger fires [facepalm emoji]" |
| N/A | No | Dialogue | E: "we have to wear masks sometimes [face mask emoji]" |
| N/A | No | Dialogue | E: "hey sorry kailan - fires are a bit of a heavy topic" |
| N/A | No | Dialogue | E: "do you feel alright about me talking about these kinds of threats?" |

| N/A | No | Dialogue Button(s) | "I do feel a bit helpless" ; "It's hard but I'd rather know than not" ; "Yes, it's OK. Tough things happen everywhere, this is no different" |
| N/A | No | Choose Dialogue Button | "It's hard but I'd rather know than not" |
| N/A | No | Dialogue | E: "nice attitude [sunglasses face emoji]" |
| N/A | No | Dialogue | E: "nature is amazing, but there is also a lot of bad news" |
| N/A | No | Dialogue | E: "it's important to know the good and the bad, and you seem ready for all of it [thumbs up emoji]" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "this is there is always something you can do and every bit helps" |
| N/A | No | Dialogue | E: "for most people the hardest thing is just finding out how to start" |
| N/A | No | Dialogue | E: "but you're doing it right now" |
| N/A | No | Dialogue | E: "this is how you start [star eyes emoji]" |
| N/A | No | Dialogue | A: "Yep. And I just started out as a volunteer… now look at me" |
| N/A | No | Dialogue | A: "Anyway kailan, you'd better get back in there. No need for a mask though |
| N/A | No | Dialogue | A: "Let's get you back on some water level readings. Here's the mission: " |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Pisang Pisang Bisar |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kemuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Hi" |
| N/A | No | Dialogue Button(s) | "Hiiiii" |
| N/A | No | Choose Dialogue Button | "Hiiiii" |
| N/A | No | Dialogue | A: "Superb water level reading there!" |
| N/A | No | Dialogue | E: "thanks so much, kailan!" |
| N/A | No | Dialogue Button(s) | "Is this really helping?" |
| N/A | No | Choose Dialogue Button | "Is this really helping?" |
| N/A | No | Dialogue | E: "yes!" |
| N/A | No | Dialogue | E: "the levels are confirmed with HQ, and it looks like we're doing ok! [thumbs up emoji]" |
| N/A | No | Dialogue | E: "here's a note about why we collect data on this stuff -" |
| Tap | No | Accept Button | Journal Entry |
| N/A | No | Dialogue | A: "Now - Eka and I have been working on something big for you… just need to complete a final test of Wildiverse" |
| N/A | No | Dialogue | A: "I've set up your mission for you to scan a few more bits for us…" |
| N/A | No | Dialogue | E: "… and then it's CONGO TIME [gorilla emoji]" |
| N/A | No | Dialogue | A: "Eka that was going to be a surprise" |

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | A: "Well - here it is - your final mission with Fio, kailan, should you choose to accept it: " | |
| Accept Button | No | Tap | No | Accept |
| Wildiverse Tab | No | Tap | No | mission |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Hampuak Galaget | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Orangutan Nest | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Hampuak Galaget | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Termite Branch | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Orangutan | |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |

| N/A | No | Dialogue | A: "Well… wow! |
|-----|-----|----------|----------------|
| N/A | No | Dialogue Button(s) | "Is that a good or bad wow?" |
| N/A | No | Choose Dialogue Button | "Is that a good or bad wow?" |
| N/A | No | Dialogue | A: "Hood. Good wow. [smile face emoji]" |
| N/A | No | Dialogue | A: "You've really proven yourself" |
| N/A | No | Dialogue | A: "And we think you're definitely ready to help us in the Congo" |
| N/A | No | Dialogue | E: "and I'm going to make the official hand-over from BORNEO to CONGO" |
| N/A | No | Dialogue | E: "IN FACT THIS CALLS FOR THE CAPS LOCK BECAUSE THIS IS A MOMENT [stars emoji 1 and stars emoji 2] |
| N/A | No | Dialogue | E: "I WANT TO MAKE SOME INTRODUCTIONS" |
| N/A | No | Dialogue | E: "kailan, Espoir is BRILLIANT. And urgently needs some assistance with his work" |
| N/A | No | Dialogue | E: "Espoir kailan is possibly the best dung-finder in the world [poop emoji]" |
| N/A | No | Dialogue | Es: "Mon dieu, hold your ponies." |
| N/A | No | Dialogue | Es: "kailan welcome to the Republic of Congo." |
| N/A | No | Dialogue Button(s) | ""Hold your ponies"?" ; "Hello Espoir! Pleased to meet you" ; "Enchanté! Très heureux de vous recontrer, Espoir" |
| N/A | No | Choose Dialogue Button | Hold your ponies"?" |
| N/A | No | Dialogue | Es: "Ponies, horses whatever." |
| N/A | No | Dialogue | A: "If it's alive in this forest, Espoir can tell you what it had for breakfast [smile face emoji]" |
| N/A | No | Dialogue | Es: "Justa conservationist following apes & living his dream Amyra." |
| N/A | No | Dialogue | Es: "& now it's time to meet Buka." |
| N/A | No | Dialogue | Es: "Here's everything for your journal." |

I didn't select the Accept Button at this point, and when I restarted the app it was not there. The game would not let me proceed, so I had to clear my data and replay the game (roughly two hours).

**Buka**

| Tap | No | Collect | Journal Entry |
|-----|-----|---------|---------------|

|     |    | Button   |                                                                        |
| --- | -- | -------- | ---------------------------------------------------------------------- |
| N/A | No | Dialogue | A: "Yep! Wildiverse installation upgraded so you can track Buka as well as Fio" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | A: "Not at the same time of course… this isn't Planet of the Apes"" |
| N/A | No | Dialogue | A: "kailan… you're going to the Congo!" |
| N/A | No | Dialogue | A: "Or rather - the Congo is coming to you" |
| N/A | No | Dialogue | A: "Can you get out into the forest and see how well we've calibrated Wildiverse gorillas?" |
| Tap | No | Dialogue | Accept Button |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "I am delighted to confirm: it works. You have found Buka, & one of his old nests. |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "I learned from the best" |
| N/A | No | Choose Dialogue Button | "I learned from the best" |
| N/A | No | Dialogue | E: "[blush smile face]" |
| N/A | No | Dialogue Button(s) | "I was thinking of Fio" |
| N/A | No | Choose Dialogue Button | "I was thinking of Fio" |
| N/A | No | Dialogue | Es: "Well, it's good you learned." |
| N/A | No | Dialogue | Es: "Because Nouabale-Ndoki National Park is 1,500 square miles" |
| N/A | No | Dialogue | Es: "One of the last intact forests & largest concentration of wildlife in Africa." |
| N/A | No | Dialogue | Es: "& gorillas can walk all day through thick jungle." |
| N/A | No | Dialogue | Es: "So you need to be on your game." |
| N/A | No | Dialogue Button(s) | "So gorillas make their nests on the ground, then?" |
| N/A | No | Choose Dialogue Button | "So gorillas make their nests on the ground, then?" |
| N/A | No | Dialogue | Es: "Young gorillas sometimes nest in trees, like orangutans." |
| N/A | No | Dialogue | Es: "Big gorillas like Buka… are too big." |
| N/A | No | Dialogue | Es: "Here's a note about gorillas for your journal: " |
| N/A | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "Can you find a newer nest?" |
| N/A | No | Dialogue | Es: "I would love to get a DNA scan from some hair." |
| N/A | No | Dialogue | Es: "Well, it's good you learned." |
| Tap | No | Accept Mission | Move to Next Stage |

| | | | |
|---|---|---|---|
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "kailan ! Would you like the good news or the bas news first?" |
| N/A | No | Dialogue Button(s) | "The good news" ; "The bad news" |
| N/A | No | Choose Dialogue Button | "The good news" |
| N/A | No | Dialogue | Es: "The good news is… you found a nest!" |
| N/A | No | Dialogue | Es: "Superb!" |
| N/A | No | Dialogue | Es: "But the bad news…" |
| N/A | No | Dialogue | Es: "It must be an old one." |
| N/A | No | Dialogue | Es: "It's a big forest, kailan." |
| N/A | No | Dialogue | Es: "And Eka was correct. You are a nest-finding machine." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "I heart the rain forest. Wildiverse version at least" |
| N/A | No | Choose Dialogue Button | "I heart the rain forest. Wildiverse version at least" |
| N/A | No | Dialogue | Es: "For me, this is the last untouched forest we have." |
| N/A | No | Dialogue | Es: "When our lead scientist got here 25 years ago, he found chimpanzees & gorillas that may have never met humans." |
| N/A | No | Dialogue | Es: "He founded the Goualougo Triangle Ape Project." |
| N/A | No | Dialogue | Es: "It's the only place in the world where chimps & gorillas have been seen eating together." |
| N/A | No | Dialogue | Es: "Now it's one of the most important ape & rainforest research sites in the world." |
| N/A | No | Dialogue Button(s) | "I'd better be on my best behavior, then." |
| N/A | No | Choose Dialogue Button | "I'd better be on my best behavior, then." |
| N/A | No | Dialogue | Es: "Yes. The gorillas will notice your manners. & they will judge you." |
| N/A | No | Dialogue Button(s) | "Seriously?" |
| N/A | No | Choose Dialogue Button | "Seriously?" |
| N/A | No | Dialogue | Es: "No." |
| N/A | No | Dialogue | Es: "Let's see if you can find a newer nest with some hair left in it - & keep an eye open for Buka too!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse | |

| | | Tab | |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Scan Button | Gorilla Nest | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Mbili | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Mbili | |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | Es: "Still no gorilla hair kailan, but it's really useful to see Buka's eating mbili." | |
| N/A | No | Dialogue Button(s) | "Great!" | |
| N/A | No | Choose Dialogue Button | "Great!" | |
| N/A | No | Dialogue Button(s) | "How similar are guerrillas to orangutans?" ; "how similar are gorrilers to orangutans?" ; "How similar are gÖrril gurillag gerbill iskskjsdkjskjd I give up" | Weird. Same joke. |
| N/A | No | Choose Dialogue Button | "How similar are guerrillas to orangutans?" | |
| N/A | No | Dialogue | Es: "That is not how you spell 'gorilla'." | |
| N/A | No | Dialogue | Es: "They are both apes. But they are very different." | |
| N/A | No | Dialogue | Es: "Here er have western lowland gorillas (scientific name 'Gorilla gorilla gorilla')." | |
| N/A | No | Dialogue | Es: "Breakfast is at 5:30 AM. They make their nests at around 5 PM." | |
| N/A | No | Dialogue | Es: "Between that: eating, moving& napping. They like fruit, leaves and stems." | |
| N/A | No | Dialogue | Es: "So they have structured days. In this way, they are similar." | |
| N/A | No | Dialogue | Es: "Unlike orangutans, gorillas live in groups led by big silverbacks like Buka." | |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "Being a gorilla is largely about family politics and food." |
| N/A | No | Dialogue | Es: "It is high-stakes reality TV. There's comedy. Drama. Heartbreak." |
| N/A | No | Dialogue | Es: "Buka is the lead. He is pure muscle, probably around 1.7 meters tall, & 150kg." |
| N/A | No | Dialogue | Es: "That's 5 foot 6 and 330 pounds if you prefer)" |
| N/A | No | Dialogue | Es: "& all that on a vegetarian diet, if you don't count the termites." |
| N/A | No | Dialogue | A: "Actually kailan talking about gorilla food…" |
| N/A | No | Dialogue | A: "Can you keep an eye out for some new types?" |
| N/A | No | Dialogue | A: "I'm still fine-tuning Wildiverse for this ecosystem!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

|   |   |   |   |   |
|---|---|---|---|---|
|   |   |   | target |   |
| Tap | Yes | Scan Button | Fusa |   |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |   |
| Tap | Yes | Scan Button | Mbili |   |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |   |
| Tap | Yes | Scan Button | Mbili |   |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |   |
| Tap | Yes | Scan Button | Mbili |   |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |   |
| Tap | Yes | Scan Button | Mboto |   |
| Tap | Yes | Continue Button | Shows summary of scanned objects |   |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |   |
| N/A | No | Dialogue | A: "Thanks kailan - Congo seems to be working *almost* as well as Borneo [conifer tree emoji and deciduous tree emoji] |   |
| N/A | No | Dialogue Button(s) | "Phew" | Weird. Same joke. |
| N/A | No | Choose Dialogue Button | "Phew" |   |
| N/A | No | Dialogue | E: "hey espoir how's it going?" |   |
| N/A | No | Dialogue | Es: "Kickin back by the new pool sippin cocktails listenin to rhumba [dancing women in costume emoji]" |   |
| N/A | No | Dialogue | E: "you lie [big nose emoji and winking emoji] |   |
| N/A | No | Dialogue | Es: "I do lie. Eka, I'm literally digging a hole." |   |
| N/A | No | Dialogue | Es: "For a drop toilet." |   |
| N/A | No | Dialogue | Es: "But yes it's going OK. Setting up again. A full three months until I'm home." |   |
| N/A | No | Dialogue Button(s) | "Three months! That must be hard" | Weird. Same |

joke.

| | | | |
|---|---|---|---|
| N/A | No | Choose Dialogue Button | "Three months! That must be hard" |
| N/A | No | Dialogue | Es: "Actually? It's OK. For me. Don't have a family of my own/on the road a lot anyway." |
| N/A | No | Dialogue | Es: "Some people who work here only get a couple of months a year with their families." |
| N/A | No | Dialogue | Es: "It's tougher for them. But income is income." |
| N/A | No | Dialogue | A: "Speaking of family. Can you get a scan of Buka's family dinner?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Boboko Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Boboko Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| Tap | Yes | Scan Button | Mboto |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |

| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
|---|---|---|---|
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Spendide! Food scanned. Boboko & tondolo stems." |
| N/A | No | Dialogue Button(s) | "Tasty" |
| Tap | No | Choose Dialogue Button | "Tasty" |
| N/A | No | Dialogue | Es: "Typical "terrestrial herbaceous vegetation", delicious." |
| N/A | No | Dialogue | A: "Ah, good old "THV" [leaf stem emoji]." |
| N/A | No | Dialogue Button(s) | "That sounds like dinner at Gwyneth Paltrow's house" ; "That sounds like dinner at Area 51" ; "That sounds like non-woody plants with broad leaves that grow between trees" |
| Tap | No | Choose Dialogue Button | "That sounds like non-woody plants with broad leaves that grow between trees" |
| N/A | No | Dialogue | Es: "You are suddenly an expert on the diet of the western lowland gorilla?" |
| N/A | No | Dialogue | Es: "I am suspicious, but OK." |
| N/A | No | Dialogue | Es: "Gorillas love THV. But they also love fruit & can eat a lot when it's available. As it happens to be now." |
| N/A | No | Dialogue | Es: "In total, Buka eats up to 18 kilos of food every day!" |
| N/A | No | Dialogue | Es: "He also eats termites… although we're not picking any up right now." |
| N/A | No | Dialogue | Es: "Keep following him… & perhaps soon we will find some." |

| | | | |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Branches |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mbili |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Branches |

Training you how to engage with the real world. Modeling it. Or at least trying to do so.

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Merci kailan." |
| N/A | No | Dialogue Button(s) | "No termites. Sorry. Scanned a lot of gorilla dung, though" |
| Tap | No | Choose Dialogue Button | "No termites. Sorry. Scanned a lot of gorilla dung, though" |
| N/A | No | Dialogue | Es: "I saw. Dung emoji." |
| N/A | No | Dialogue | Es: "C'est bizarre. Poor Buka. I hope he's all right." |
| N/A | No | Dialogue | A: "kailan - Espoir's phone doesn't do emojis [two poop emojis]" |
| N/A | No | Dialogue | Es: "It's true - but I still like trying to use them. Smile emoji." |
| N/A | No | Dialogue | A: "[crying laugh emoji]" |
| N/A | No | Dialogue | Es: "Anyway - all these dung samples are very useful to understand Buka's health." |
| N/A | No | Dialogue | Es: "Stress. Parasites. Diet. Whatever Buka's got." |
| N/A | No | Dialogue | A: "Test results! The hair in the nest is not Buka's. The [poop emoji] is, however." |
| N/A | No | Dialogue | A: "Analyzing that further" |
| N/A | No | Dialogue | Es: "Ah! The hair's probably from one of Buka's ladies. He has four in his group." |
| N/A | No | Dialogue | Es: "Two young males too. Could be theirs." |
| N/A | No | Dialogue | Es: "Buka's group isn't as big as other groups.." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "But he seems to like it that way. He is remarkably laid back." |
| N/A | No | Dialogue | Es: "Here's a note about his family: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "OK kailan - Wildiverse is detecting a little bit more. Go and scan it for me and then I think we are done with dung: " |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | Es: "Theme of the day is apparently dung." | |
| N/A | No | Dialogue Button(s) | "I need to de-dung my life. This is not what I signed up for." | |
| Tap | No | Choose Dialogue Button | "I need to de-dung my life. This is not what I signed up for." | |
| N/A | No | Dialogue | Es: "Stop. Wait. If you think YOU have it hard, listen: " | Feels a but finger wagging |
| N/A | No | Dialogue | Es: "Just to get from HQ to basecamp in Goualougo we have to: " | |
| N/A | No | Dialogue | Es: "Drive two hours through the forest." | |
| N/A | No | Dialogue | Es: "Paddle for two hours through the forest." | |
| N/A | No | Dialogue | Es: "Walk 17 km &then wade through chest-high black water for 45 minutes." | |
| N/A | No | Dialogue | Es: "This is one of the most inaccessible places on the planet. Here's a note about it: " | |
| N/A | No | Dialogue | Es: "If it's not raining, it is so humid you sweat until you drip." | |
| N/A | No | Dialogue | Es: "This brings the sweat bees, which don't sting, but are seriously annoying." | |
| N/A | No | Dialogue | Es: "& do not et me started on keeping watch for forest elephants." | |
| N/A | No | Dialogue Button(s) | "Hey Espoir, I think I just saw some silverback hair and some termites" | |
| Tap | No | Choose Dialogue Button | "Hey Espoir, I think I just saw some silverback hair and some termites" | This feels like such a cold response. And how can I see that? |
| N/A | No | Dialogue | Es: "I believe you are trying to distract me from my tale of woe." | |
| N/A | No | Dialogue | Es: "…" | |
| N/A | No | Dialogue | Es: "But actually - you might be right. Get in there kailan!" | |
| N/A | No | Dialogue | A: "Oh - wait" | |
| N/A | No | Dialogue | A: "before you do. I've got someone to introduce! [hug emoji]" | |

Sindelar 438

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | A: "kailan, meet Jodi of Zoo Atlanta!" |
| N/A | No | Dialogue | A: "JODIIIIIIIIIII WE MISS YOU OVER HERE" |
| N/A | No | Dialogue | Jo: "Ha ha! Espoir! We miss YOU [gorilla emoji]" |
| N/A | No | Dialogue | Es: "If you like gorillas, you'll love Jodi, kailan." |
| N/A | No | Dialogue Button(s) | "Espoir, did you just compare Jodi to a gorilla?" |
| Tap | No | Choose Dialogue Button | "Espoir, did you just compare Jodi to a gorilla?" |
| N/A | No | Dialogue | Jo: "Ha ha! What Espoir MEANS is that I live and breathe gorillas" |
| N/A | No | Dialogue | Jo: "I've been working with primates my whole life - " |
| N/A | No | Dialogue | Jo: "I'm head of gorilla care at Zoo Atlanta" |
| N/A | No | Dialogue | Jo: "We care for one of the largest groups of western lowland gorillas in North America" |
| N/A | No | Dialogue | Jo: "So we're working a lot with the Goualougo Triangle Ape Project -" |
| N/A | No | Dialogue | Jo: "Exchanging findings and research (and pictures of apes doing hilarious things)" |
| N/A | No | Dialogue | Es: "All of this is true." |
| N/A | No | Dialogue | Jo: "To be honest, I'd love to see Wildiverse working? Cool if I look over your shoulder kailan?" |
| N/A | No | Dialogue Button(s) | "Oui. As we say in the Congo" |
| Tap | No | Choose Dialogue Button | "Oui. As we say in the Congo" |
| N/A | No | Dialogue | Es: "Enough tongue wagging. BRING ME TERMITES!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter | Move to Next Stage |

| Tap | No | Wildiverse I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| N/A | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Nest |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Who ordered the dung and termite combo?" |
| N/A | No | Dialogue Button(s) | "Espoir?" |
| Tap | No | Choose Dialogue Button | "Espoir?" |
| N/A | No | Dialogue | Es: "Merci kailan! Let's get it all analysed." |
| N/A | No | Dialogue | Es: "Gorillas love termites. They rip open their nests & shovel them in like popcorn." |
| N/A | No | Dialogue | Es: "They like to vary their diet with a bit of animal protein." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | A: "Ding dong [bell emoji]" |
| N/A | No | Dialogue | A: "DUNG ANALYSIS UPDATE" |
| N/A | No | Dialogue | A: "Lab says Buka had 'bad guts'. Something he ate [three poop emojis]" |
| N/A | No | Dialogue | Jo: "Even I could tell that from the amount of dung kailan has been finding" |
| N/A | No | Dialogue | Jo: "At Zoo Atlanta we could really observe a sick gorilla closely, diagnose this quick" |
| N/A | No | Dialogue | Jo: "kailan can you get me some samples of what Buka has been eating?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bambu |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Bambu |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bambu |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Branches |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Boboko |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Boboko |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Boboko |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Jo: "Thank you kailan! Evidence of an animal's eating habit s in the wild is so important for us" |
| N/A | No | Dialogue Button(s) | "Jodi I've been thinking. You work with gorillas in the zoo right?" |
| Tap | No | Choose Dialogue Button | "Jodi I've been thinking. You work with gorillas in the zoo right?" |
| N/A | No | Dialogue | Jo: "Yep. As caretaker my primary work is to care and health of gorillas at Zoo Atlanta" |
| N/A | No | Dialogue | Jo: "We share what we know with other zoos so that gorillas get care of the best quality" |
| N/A | No | Dialogue | Jo: "We want to reproduce wild conditions as closely as we can in the zoo" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Jo: "Let people see wild behavior. Inspire visitors to action." |
| N/A | No | Dialogue Button(s) | "But isn't a gorilla's life best in the wild?" ; "Makes sense!" |
| Tap | No | Choose Dialogue Button | "But isn't a gorilla's life best in the wild?" |
| N/A | No | Dialogue | Jo: "I'm not going to argue with that. But here's the thing -" |
| N/A | No | Dialogue | Jo: "At the zoo we can study and treat gorillas very closely" |
| N/A | No | Dialogue | Jo: "Like - ultrasound scans for heart conditions/vaccinations [vax emoji] |
| N/A | No | Dialogue | Jo: "We literally train gorillas to volunteer blood pressure readings" |
| N/A | No | Dialogue | Es: "If I tried to take Buk'a blood pressure, I would need a new face." |
| N/A | No | Dialogue | Es: "& he has been habituated to humans." |
| N/A | No | Dialogue | Jo: "EXACTLY and you have an excellent face Espoir" |
| N/A | No | Dialogue | Jo: "So we can study diseases, find treatments, share it with projects like Goualougo" |
| N/A | No | Dialogue | Jo: "Here's a journal note for your journal kailan: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Jo: "And this may sound ridiculous until you see it, but our gorillas are part of a team" |
| N/A | No | Dialogue | Jo: "Their contribution is honorable" |
| N/A | No | Dialogue | Es: "Oh hey, speaking of |

| | | | contributions kailan…" |
|---|---|---|---|
| N/A | No | Dialogue | Es: "We've got some scientists visiting from the UK." |
| N/A | No | Dialogue | Es: "Their researching the effects of tree logging on biodiversity." |
| N/A | No | Dialogue | Es: "& they really want some data on different seed pods. Can you scan some for them?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Baso |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Baso |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Baso |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Great work! A gorilla nest which actually contains some hair…" |
| N/A | No | Dialogue Button(s) | "Finally" |
| N/A | No | Choose Dialogue Button | "Finally" |
| N/A | No | Dialogue | Es: "& baso and yonga. Buka loves …" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "The elephant chased us… but it was only a warning." |
| N/A | No | Dialogue | Es: "But someone very foolish lost a tablet with all he observation data on." |
| N/A | No | Dialogue | Es: "He also dropped an unlocked satellite phone set to the Wildiverse chat channel."     Could have been a cool pic opportunity |
| N/A | No | Dialogue | A: "Was this foolish person you, Espoir?" |
| N/A | No | Dialogue | Es: "All I can say is yjay man was alamrmed by an ELPHNT." |
| N/A | No | Dialogue | Es: "We need to find these things or this person will have to do the washing up for a month." |
| N/A | No | Dialogue | Jo: "Amyra isn't this just the kind of thing Wildiverse was built for?" |
| N/A | No | Dialogue | A: "Well, no not really… but it should be able to scan for Espoir's stuff." |
| N/A | No | Dialogue | Jo: "Amazing! Well I'll leave you to it then - and thanks for your help kailan" |
| N/A | No | Dialogue | Jo: "I'll be back when I need more help with great ape health!" |
| N/A | No | Dialogue | A: "See you in a bit Jodi [hand emoji]" |
| N/A | No | Dialogue | A: "Wildiverse just finished a new scan of your area Espoir" |
| N/A | No | Dialogue | Es: "OK kailan - let's see if Wildiverse can spot any of my lost things!" |
| N/A | No | Dialogue | Es: "And anything else of interest nearby." |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Poncho |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "That poncho… possibly one I dropped." |
| N/A | No | Dialogue Button(s) | "A clue!" |
| N/A | No | Choose Dialogue Button | "A clue!" |
| N/A | No | Dialogue | A: "And according to DNA analysis, one of those nests is Kingo's and the other belongs to one of Buka's daughter's - Mette" |
| N/A | No | Dialogue | Es: "Of course! A couple of years ago Kingo took Mette." |
| N/A | No | Dialogue | Es: "It's every silverback's responsibility to maintain & expand its group." |
| N/A | No | Dialogue | Es: "Now Kingo is back and so is Mette. I'd love to see their interaction." |
| N/A | No | Dialogue Button(s) | "What does it take to be a silverback?" |
| N/A | No | Choose Dialogue Button | "What does it take to be a silverback?" |
| N/A | No | Dialogue | Es: "About 12 years to get to the silver hair, about 18 to become the big guy." |
| N/A | No | Dialogue | Es: "When you get to full adulthood, you either go solo to try and start your own group, or fight to be boss. Here's a note about it all: |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "Salut mon choux kailan gorilla, never in sweat bee chimpanzee, tool stick, please true Amyra & extrapolate gorilla, goodnight kailan before |

| | | | Wildiverse be alive in Goualougo never on a canoe kailan but OK;;;" |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "Excuse me?" |
| N/A | No | Choose Dialogue Button | "Excuse me?" |
| N/A | No | Dialogue | Es: "I did not write that! Something has found the lost satellite phone." |
| N/A | No | Dialogue | Es: "And it is writing texts using autocorrect." |
| N/A | No | Dialogue | Es: "Maybe a chimpanzee. Their fingers are small enough." |
| N/A | No | Dialogue | Es: "A putty-nosed monkey or a gre4y-cheeked mangabey does not have the brains." |
| N/A | No | Dialogue Button(s) | "Wait. An ape just sent us a group message from the forest?" |
| N/A | No | Choose Dialogue Button | "Wait. An ape just sent us a group message from the forest?" |
| N/A | No | Dialogue | Es: "I believe so. It has become important that we find those devices I lost." |
| N/A | No | Dialogue | Es: "Thankfully I've finally finished the drop toilet I'm making." |
| N/A | No | Dialogue | Es: "It even has a toilet roll holder." |
| N/A | No | Dialogue | Es: "Have that, Sebangau. With your microwave and surround sound home movie theater." |
| N/A | No | Dialogue | E: "tbh we have neither of those things at our camp in Borneo" |
| N/A | No | Dialogue | E: "don't get salty just because u jealous of our gibbons" |
| N/A | No | Dialogue Button(s) | "Eka. Espoir. Can't we get along?" |
| N/A | No | Choose Dialogue Button | "Eka. Espoir. Can't we get along?" |
| N/A | No | Dialogue | Es: "You literally have 4G and Netflix there, Eka." |
| N/A | No | Dialogue | E: "salty" |
| N/A | No | Dialogue | Es: "Extrapolate the primate tool use before breakfast if I poke it with a stick it will dance and that is kailan kailan kailan;;;" |
| N/A | No | Dialogue | E: "please for the love of all that is holy and pure on this good earth [hands together emoji]" |
| N/A | No | Dialogue | E: "find that satellite phone and throw it into a swamp" |
| N/A | No | Dialogue | A: "I'm picking up a digital signal, and I've calibrated Wildiverse kailan - get out there!" |

| | | | |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bongi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bongi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Tondolo Stem |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ngombe Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ngombe Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| N/A | No | Dialogue Button(s) | "But it sounds… a bit much out in Goualougo" ; "But it sounds like I'd never want to leave Goualougo ; "But I have no idea what you have to do to get to Goualougo"  *No option to say otherwise here* |
| N/A | No | Choose Dialogue Button | "But I have no idea what you have to do to get to Goualougo" |
| N/A | No | Dialogue | Es: "Honestly, getting involved in conservation work is much easier than you think." |
| N/A | No | Dialogue | Es: "I grew up on the edge of a forest kind of like this one." |
| N/A | No | Dialogue | Es: "But I've contributed to seminars and projects from Scandinavia to New Zealand." |
| N/A | No | Dialogue | Es: "I promise you, wherever you are, there's a local project." |
| N/A | No | Dialogue | Es: "meet extrapolate Wildiverse to gorilla or never cross the canoe to the dugout Goualougo for kailan kailan kailan;;;" |
| N/A | No | Dialogue | A: "I promise you that if that phone isn't found soon I will come to Goualougo myself" |
| N/A | No | Dialogue | Es: "Sounds like a threat but OK." |
| N/A | No | Dialogue | A: "We haven't found its signal yet…but it looks like another man-made object is being detected… as well as A LOT of food [thinking emoji]" |
| N/A | No | Dialogue | Es: "Do what needs to be done, kailan" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |

| Tap | No | Enter Wildiverse | Move to Next Stage |
|---|---|---|---|
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Zanha |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Zanha |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ngata |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ngata |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Head Net |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Extrapolate the tree data for the canoe, you are a big dug out tool user canoe in the face for fruit breakfast dung samples kailan kailan kailain;;;" |
| N/A | No | Dialogue Button(s) | "?" |
| Tap | No | Choose Dialogue Button | "?" |
| N/A | No | Dialogue | A: "I hope whatever has the phone accidentally drops it into a bai" |
| N/A | No | Dialogue | Jo: "NOOOO,find it and give it to us" |
| N/A | No | Dialogue | Es: "Ah Jodi you are back?" |
| N/A | No | Dialogue | Jo: "I'm a lurker, I admit it" |
| N/A | No | Dialogue | Jo: "But this is relevant to me" |
| N/A | No | Dialogue | Jo: "They're mining coltan for phone batteries only a few hundred miles from you right now" |
| N/A | No | Dialogue | Jo: "The mining's threatening gorilla populations, so we have recycling points for phones at the zoo…" |
| N/A | No | Dialogue | Jo: "A small thing to reduce the demand" |
| N/A | No | Dialogue | Jo: "And all part of our education programmes… explaining what ACTIONS we can all take [strong arm]" |
| N/A | No | Dialogue Button(s) | "No recycling in the swamp. But what is this "mesh'?" |
| Tap | No | Choose Dialogue Button | "No recycling in the swamp. But what is this "mesh'?" |
| N/A | No | Dialogue | Es: "I dropped that during the ELPHNT chase." |
| N/A | No | Dialogue | Es: "It's for keeping sweat bees off your face." |
| N/A | No | Dialogue | Es: "They will swarm you and get in your ears." |
| N/A | No | Dialogue | Es: "Best to just let them do their thing cause you'll never |

| | | | get them out." |
|---|---|---|---|
| N/A | No | Dialogue | A: "Espoir - bad news - I've lost the signal. I'm just getting lots of animal activity instead." |
| N/A | No | Dialogue | A: "kailan can you investigate?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bird feathers |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Nguluma |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "kailan can you investigate?" |
| N/A | No | Dialogue Button(s) | "Thanks" |
| Tap | No | Choose Dialogue | "Thanks" |

| | | Button | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "A lot of my work is recording when trees flower, when they fruit." |
| N/A | No | Dialogue | Es: "Densities of different tree species. What animals eat and don't eat." |
| N/A | No | Dialogue | Es: "The diversity of life here is really something." |
| N/A | No | Dialogue | Es: "310 different kinds of trees. 700 species of plants. And then the animals." |
| N/A | No | Dialogue | Es: "Everything needs something else. When you see it, it's basically miraculous." |
| N/A | No | Dialogue | Es: "I just hope we can continue to control the logging. Here's a note about it. |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "What do you think is the biggest effect of logging here in the Congo?" |
| N/A | No | Dialogue Button(s) | "Deforestation and loss of habitats?" ; "Loggers - people - poachers?" ; "Loss of special trees that animals depend on? |
| Tap | No | Choose Dialogue Button | "Deforestation and loss of habitats?" |
| N/A | No | Dialogue | Es: "We're lucky so far that this hasn't happened here, though it is happening in other parts of the African rainforest." |
| N/A | No | Dialogue | Es: "OK, how much time do you have?" |
| N/A | No | Dialogue | Es: "(that was a rhetorical question)" |
| N/A | No | Dialogue | Es: "They don't chop down everything, like in Latin America or Asia." |
| N/A | No | Dialogue | Es: "They select specific trees for, for export." |
| N/A | No | Dialogue | Es: "But we don't know that long term impacts, since the trees take so long to grow back." |
| N/A | No | Dialogue | Es: "So… still a big risk, and that's why our research is so important." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "But the loggers make roads." |
| N/A | No | Dialogue | Es: "And then trouble drives in and out on those roads." |
| N/A | No | Dialogue Button(s) | "What kind of trouble?" |
| Tap | No | Choose Dialogue Button | "What kind of trouble?" |
| N/A | No | Dialogue | Es: "Ah, kailan. Rather than explain, you should see for yourself." |
| N/A | No | Dialogue | Es: "I'm detecting some human traces." |
| N/A | No | Dialogue | A: "Not your phone Espoir. I think we may have lost it… for now [straight face emoji]" |
| N/A | No | Dialogue | Es: "Zut alors!" |
| N/A | No | Dialogue | Es: "Well, find these other human traces, and that will tell you what you need to know." |
| N/A | No | Dialogue | Es: "kailan gorilla kailan extrapolate sweat bee tools after breakfast I will canoe the sweat bees; hello;;;: |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to | |

|     |     | Scan | |
| --- | --- | --- | --- |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Flip Flop |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Campfire |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Flip Flop |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Flip Flop |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Someone's old sandal. A camp fire. Some trash. Sad emoji. |

| N/A | No | Dialogue Button(s) | "This stuff isn't yours, is it Espoir?" |
|-----|----|--------------------|------------------------------------------|
| Tap | No | Choose Dialogue Button | "This stuff isn't yours, is it Espoir?" |
| N/A | No | Dialogue | Es: "No. This is the 'trouble' I was talking about, sadly." |
| N/A | No | Dialogue | Es: "The logging industry creates new villages and towns." |
| N/A | No | Dialogue | Es: "& the people who live there need to eat." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "The logging roads give people easy access deep into the forest to hunt for bushmeat.. Sometimes right up to the park." |
| N/A | No | Dialogue Button(s) | "Dare I ask what bushmeat is?" |
| Tap | No | Choose Dialogue Button | "Dare I ask what bushmeat is?" |
| N/A | No | Dialogue | Es: "Anything. Everything. Reptiles. Antelope. Apes. Monkeys. Here's a note: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "The human need for protein can drain the forest of animals" |
| N/A | No | Dialogue Button(s) | "Wow. Oh. My. Apes. That's… gorillas?" |
| Tap | No | Choose Dialogue Button | "Wow. Oh. My. Apes. That's… gorillas?" |
| N/A | No | Dialogue | Es: "I've seen everything for sale in a market somewhere." |
| N/A | No | Dialogue | Es: "Gorillas get injured by snares meant for other animals." |
| N/A | No | Dialogue | Es: "& people sell baby gorillas as pets. Don't ask me why." |
| N/A | No | Dialogue | Es: "Look, let's do something useful. I think Buka's near some more man-made items… which are mine!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready | Move to Next Stage |

| | | Button | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Twig |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Surgical Mask |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Twig |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Broken Twig |

| Tap | Yes | Continue Button | Shows summary of scanned objects |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "What a haul kailan!" |
| N/A | No | Dialogue Button(s) | "A facemask, broken twigs, termite nest, gorilla nest and dung…" |
| Tap | No | Choose Dialogue Button | "A facemask, broken twigs, termite nest, gorilla nest and dung…" |
| N/A | No | Dialogue | A: "Some kind of gorilla hospital? [wink emoji]" |
| N/A | No | Dialogue | Es: "The logging industry creates new villages and towns. No. We always wear facemasks when we spend time with gorillas." |
| N/A | No | Dialogue | Es: "They don't want what we've got and we don't want they've got." |
| N/A | No | Dialogue | Es: "Gorillas are really susceptible to human respiratory illnesses." |
| N/A | No | Dialogue | Es: "And that's just for a start." |
| N/A | No | Dialogue | Es: "[face mask emoji]" |
| N/A | No | Dialogue | Es: "Humans and gorillas can pass diseases back and forth. Here's a note about it." |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "We've found ebola in gorilla populations outside Ndoki." |
| N/A | No | Dialogue | Es: "That would decimate our gorillas. And we don't want that." |
| N/A | No | Dialogue | A: "[three face mask emojis]!" |
| N/A | No | Dialogue | Es: "Speaking of health, actually…" |
| N/A | No | Dialogue | Es: "We're detecting some fresh samples from Buka's group… and some nearby man-made items!" |
| N/A | No | Dialogue | A"Surely it's not your satellite phone Espoir" |
| N/A | No | Dialogue | A: "I'm not picking up any signals…" |
| N/A | No | Dialogue | Es: "kailan you had better get in there and see |

| | | | what's going on: " |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Fusa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bullets |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bullets |

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Oh, man. Bullets. |
| N/A | No | Dialogue Button(s) | "And lots of gorilla food" |
| Tap | No | Choose Dialogue Button | "And lots of gorilla food" |

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | Es: "Oui. But mon dieu." | |
| N/A | No | Dialogue | Es: "Those are poacher's bullets." | |
| N/A | No | Dialogue | Es: "They're not here for Buka though - do not worry." | |
| N/A | No | Dialogue | Es: "The poachers come for the ivory from elephants." | |
| N/A | No | Dialogue | Es: "And it's now easy for the, to get it out because of the new logging roads." | Accessibility can be a very bad thing |
| N/A | No | Dialogue Button(s) | "There are men with guns in this national park?" | Funny because there are here too |
| Tap | No | Choose Dialogue Button | "There are men with guns in this national park?" | |
| N/A | No | Dialogue | Es: "Oui." | |
| N/A | No | Dialogue | Es: "Machine guns aren't hard to find in former conflict zones." | |
| N/A | No | Dialogue | Es: "People are poop. Guns are cheap. Ivory is valuable." | |
| N/A | No | Dialogue | Es: "If we see poachers, we turn around." | |
| N/A | No | Dialogue | Es: "I mean… I have never held a gun in my life. We let them be." | |
| N/A | No | Dialogue | E: "hey" | |
| N/A | No | Dialogue | E: "I know this feeling" | |
| N/A | No | Dialogue | E: "it's a bad feeling [cry face emoji]" | |
| N/A | No | Dialogue | Es: "kailan if a poacher is caught, what do you think should happen to them?" | |
| N/A | No | Dialogue Button(s) | "Lock them up for life" ; "Punish them, but don't ruin their lives" ; "Let the, go… they're just trying to survive" | |
| Tap | No | Choose Dialogue Button | Punish them, but don't ruin their lives | |
| N/A | No | Dialogue | Es: "You know it's a tough situation, and everyone has a different opinion." | |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "I know some poachers. They are really poor with few other options to feed their families." |
| N/A | No | Dialogue | Es: "I do believe we need to punish illegal activity…" |
| N/A | No | Dialogue | Es: "But the blame really lies with the people behind buying ivory, and the cartels that run the market." |
| N/A | No | Dialogue | Es: "That's who er really need to go after." |
| N/A | No | Dialogue | Es: "Right now, when we find a poacher we just carry on & do our jobs & report everything we find, so the eco-guards can do their job." |
| N/A | No | Dialogue | E: "I feel you Espoir." |
| N/A | No | Dialogue | E: "next time you come to Borneo you can use our microwave" |
| N/A | No | Dialogue | Es: "Merci Eka." |
| N/A | No | Dialogue | Es: "And you can charge your phone on our solar panel if ever you make it out here." |
| N/A | No | Dialogue | Es: "Meanwhile, kailan I think you owe me some fresh dung." |
| N/A | No | Dialogue | A: "Actually you lot… speaking of fresh…" |
| N/A | No | Dialogue | A: "If you can complete this mission we have some exciting news for you…" |
| N/A | No | Dialogue | E: "We do [tongue out emoji]" |
| N/A | No | Dialogue | Es: "ALREADY?!" |
| N/A | No | Dialogue | A: "already" |
| N/A | No | Dialogue | Es: "Well, in that case kailan… it sounds like this is your last mission with our dear friend Buka." |
| N/A | No | Dialogue | Es: "When you are done, you will advance to your next research subject." |
| N/A | No | Dialogue | Es: "So… let's make it a good one! Do you accept?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| | | target | |
| Tap | Yes | Scan Button | Buka |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Wellkailan that was a huge haul… thank you! |
| N/A | No | Dialogue Button(s) | "You are very welcome" |
| Tap | No | Choose Dialogue Button | "You are very welcome" |
| N/A | No | Dialogue | Es: "You have proved yourself gorilla research prowess." |
| N/A | No | Dialogue | Es: "I've blocked messages from the satellite phone for now… we'll have to find it later…" |
| N/A | No | Dialogue | Es: "…Because Eka has something to say here…" |
| N/A | No | Dialogue | E: " I DO, HELLO" |
| N/A | No | Dialogue Button(s) | "Sup?" |
| Tap | No | Choose Dialogue Button | "Sup?" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "as you can see I'm using capital letters. Which means this is SERIOUS |
| N/A | No | Dialogue | E: "YOU'RE READY" |
| N/A | No | Dialogue Button(s) | "For what?" |
| Tap | No | Choose Dialogue Button | "For what?" |
| N/A | No | Dialogue | E: "it's Gibbon Day" |
| N/A | No | Dialogue | E: "we want you to meet a gibbon" |
| N/A | No | Dialogue Button(s) | "A gibbon?" |
| Tap | No | Choose Dialogue Button | "A gibbon?" |
| N/A | No | Dialogue | A: "Yes. A white-bearded gibbon" |
| N/A | No | Dialogue | A: "His name's Chilli and here's all his data: " |
| N/A | No | Dialogue | A: "I've just upgraded your Wildiverse installation, so you can now track Fio, Buka, AND Chilli" |
| N/A | No | Dialogue | A: "Chili lives in Borneo, in the same forest as Fio" |
| N/A | No | Dialogue | A: "There's a huge variety of life there - here's a not about that" |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "Fio and Chilli are actually friends!" |
| N/A | No | Dialogue | A: "I mean - We've seen them interacting, which is rare" |
| N/A | No | Dialogue | E: "so let's leave the Congo for now and et back to Borneo and meet him!" |
| N/A | No | Dialogue | E: "and put your sound on, you have to hear him sing!" |
| N/A Chilli | No | Dialogue | E:: "start by scanning him… and what he's having for breakfast" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jambu Burung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jambu Burung |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey! Well done kailan! Jambu fruit is one of Chilli's favourites [peach emoji and purple heart emoji]" |
| N/A | No | Dialogue Button(s) | "You're welcome. Gibbons really move fast" |
| Tap | No | Choose Dialogue Button | "You're welcome. Gibbons really move fast" |
| N/A | No | Dialogue | E: "Chilli isn't just any gibbon!" |
| N/A | No | Dialogue | E: "(not supposed to have favorites but chilli is mine)" |
| N/A | No | Dialogue | E: "(been following his family since he was a baby)" |
| N/A | No | Dialogue | E: "did you have your sound on?" |
| N/A | No | Dialogue Button(s) | "Yes I did. I heard Chilli singing!" ; "No I did not, what did I miss?" |
| Tap | No | Choose Dialogue Button | Yes I did. I heard Chilli singing! |
| N/A | No | Dialogue | E: "yeah! [mic emoji]" |
| N/A | No | Dialogue | E: "chilli's singing is famous (well, at our basecamp, lol)" |
| N/A | No | Dialogue | E: "he sings so much we can track him by listening" |

| | | | |
|---|---|---|---|
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "kailan get back in there and find us some more gibbon food please!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jongkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jongkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jongkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lunuk Bunyer |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | target | |
|---|---|---|---|
| Tap | Yes | Scan Button | Lunuk Bunyer |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "thanks kailan - Chilli has a slightly different diet to Fio" |
| N/A | No | Dialogue | E: "How are you finding gibbon tracking?" |
| N/A | No | Dialogue Button(s) | "Harder than orangutans and gorillas" ; "it's my calling" ; "I think gibbons are my spirit animal" |
| Tap | No | Choose Dialogue Button | "Harder than orangutans and gorillas" |
| N/A | No | Dialogue | E: "yep!" |
| N/A | No | Dialogue | E: "they're up early to sing with the family" |
| N/A | No | Dialogue | E: "eat a fruity breakfast, have a late morning rest" |
| N/A | No | Dialogue | E: "then it's high speed swinging until early bedtime at about 2:30" |
| N/A | No | Dialogue | E: "and no naps… probably to avoid meeting orangutans at fruit trees…" |
| N/A | No | Dialogue | E: "they are pretty gentle, really" |
| N/A | No | Dialogue | A: "But they can really move!" |
| N/A | No | Dialogue | E: "TELL ME ABOUT IT" |
| N/A | No | Dialogue | E: "gibbons can jump like 6 meters between trees, and swing like 12" |
| N/A | No | Dialogue | E: "sometimes we have to run to keep up" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "which is really difficult/dangerous in an actual swamp - here's a note about it all: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | A: "NEWS: Our scanners are now able to identify butterfly traps… so you should see some appearing from now on" |
| N/A | No | Dialogue | A: "Insect life's a really useful indication of the forest's health… and we use the traps to measure it" |
| N/A | No | Dialogue | A: "Get in there and find the first one to verify it's all working!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Butterfly trap |

| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | A: "Hey!" | |
| N/A | No | Dialogue Button(s) | "Hey Amyra… I scanned that butterfly trap!" | |
| Tap | No | Choose Dialogue Button | "Hey Amyra… I scanned that butterfly trap!" | |
| N/A | No | Dialogue | A: "I know! Thanks so much!" | |
| N/A | No | Dialogue | A: "No butterflies today, but Wildiverse detected some dragonflies in there…" | |
| N/A | No | Dialogue Button(s) | "Oh no. I feel like a murderer" ; "Excellent. I feel like I'm contributing to our knowledge of the forest" | What a dichotomy |
| Tap | No | Choose Dialogue Button | "Oh no. I feel like a murderer" | |
| N/A | No | Dialogue | A: "Well, look, we need to count them, too" | |
| N/A | No | Dialogue | A: "Eka what wisdom can you share with kailan about the dragonflies there?" | |
| N/A | No | Dialogue | E: "weeeell, they live under the water as babies for up to 15 years" | |
| N/A | No | Dialogue | E: "eating things like baby mosquitoes" | |
| N/A | No | Dialogue | E: "you should check out what they look like - and how their mouths work. Search for a video sometime" | |
| N/A | No | Dialogue | E: "when they finally turn into dragonflies, they fly around for a few days" | |
| N/A | No | Dialogue | E: "they mate, lay their eggs in the swamp, and then die" | |
| N/A | No | Dialogue | A: "Lovely… but bringing it back to gibbons, how about you get in there now and check on Chilli's DNA? | odd conclusion |
| Tap | No | Accept Mission | Move to Next Stage | |

| Tap | No | Select Wildiverse Tab | |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kenari |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kenari |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kenari |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gibbon Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kenari |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gibbon Poo |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Good work in there!" |
| N/A | No | Dialogue Button(s) | "Thanks- I've scanned quite a lot of gibbon [poop emoji] |
| Tap | No | Choose Dialogue Button | "Thanks- I've scanned quite a lot of gibbon [poop emoji] |
| N/A | No | Dialogue | A: "I just saw!" |
| N/A | No | Dialogue | A: "We've got DNA samples from Chilli's whole family!" |
| N/A | No | Dialogue | A: "Gibbons mate for life like humans (well, some humans, anyway)." |
| N/A | No | Dialogue | A: "Typically family is parents and two kids" |
| N/A | No | Dialogue Button(s) | "No way" |
| Tap | No | Choose Dialogue Button | "No way" |
| N/A | No | Dialogue | E: "way" |
| N/A | No | Dialogue | E: "and just like humans, they sleep in high in treetops to escape predators" |
| N/A | No | Dialogue Button(s) | "Eka. I've never met anyone who sleeps in a tree to avoid predators" |
| Tap | No | Choose Dialogue Button | "Eka. I've never met anyone who sleeps in a tree to avoid predators" |
| N/A | No | Dialogue | E: "/r/whoosh" |
| N/A | No | Dialogue | A: "OK you two. Kailan here's a note about apes: " |
| Tap | No | Collect Button | Journal Entry |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | A: "And we're now detecting a few more new foodstuff in Wildiverse" |
| N/A | No | Dialogue | A: "Can you take a look and make sure they're coming through? |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Katiou |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Katiou |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Rabutan Hutan |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Webbing Bridge |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Rabutan Hutan |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "You found the food!" |
| N/A | No | Dialogue Button(s) | "I did!" |
| Tap | No | Choose Dialogue Button | "I did!" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "rambutan is actually a very popular fruit here" |
| N/A | No | Dialogue | E: "Basically an Indonesian lychee" |
| N/A | No | Dialogue | A: "Very tasty!" |
| N/A | No | Dialogue | A: "How's everything at basecamp, Eka?" |
| N/A | No | Dialogue | E: "well, we've also had a feast [two ramen emojis, two taco emojis, and two watch emojis] |
| N/A | No | Dialogue Button(s) | "So is the food good at basecamp?" |
| Tap | No | Choose Dialogue Button | "So is the food good at basecamp?" |
| N/A | No | Dialogue | E: "yeah considering we're 20 people is the middle of a swampy forest it's [100 emoji]" |
| N/A | No | Dialogue | E: "maybe not the best place to be vegan but whatever" |
| N/A | No | Dialogue | E: "srsly we've got it all, showers, nice cabins" |
| N/A | No | Dialogue | E: "makes the 4:00 AM starts to track orangutans and gibbons [ok emoji]" |
| N/A | No | Dialogue | E: "could be worse… you've seen basecamp in congo…" we have not |
| N/A | No | Dialogue | Es: "Sounds like you'd be traumatised without Netflix, but OK." |
| N/A | No | Dialogue | A: "Espoir's still lurking then" |
| N/A | No | Dialogue | Es: "Red face emoji" |
| N/A | No | Dialogue | A: "And kailan - while collecting data on what Chilli is eating is important and all.." |
| N/A | No | Dialogue | A: "we're going to get back on to some serious habit research now" |
| N/A | No | Dialogue | Es: "So get back in, and look out for Chilli and some water level meters" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Terontang |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bajakah Luaa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bajakah Luaa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Terontang |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jangkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jangkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jangkang Kuning |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | target | |
|---|---|---|---|
| Tap | Yes | Scan Button | Jangkang Kuning |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Branch |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "Thanks! Nice work" |
| N/A | No | Dialogue Button(s) | "I live to serve. Gibbons and other apes" |
| Tap | No | Choose Dialogue Button | "I live to serve. Gibbons and other apes" |
| N/A | No | Dialogue | E: "the water data helps us understand how the ecosystem is changing - for better or worse" |
| N/A | No | Dialogue | E: "but it's not all doom and gloom" |
| N/A | No | Dialogue | E:are you an expert on gibbons songs yet? |
| N/A | No | Dialogue Button(s) | "Yes. I am a big fan of G-Pop. Questions: why do gibbons sing?" ; "To be honest I haven't actually been listening to Chilli" ; "I have no idea what you're talking about basically" |
| Tap | No | Choose Dialogue Button | Yes. I am a big fan of G-Pop. Questions: why do gibbons sing? |
| N/A | No | Dialogue | E: "oh good question… gibbons sing to strengthen social bonds" |
| N/A | No | Dialogue | E: "they sing to mark their territory… to find mates…" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "chilli sings when he goes too far from his fam and gets lost…" |
| N/A | No | Dialogue | E: "even the family duets at 4:30 am are totally worth it! |
| N/A | No | Dialogue Button(s) | "4:30 AM is kind of early, Eka, but OK" |
| Tap | No | Choose Dialogue Button | "4:30 AM is kind of early, Eka, but OK" |
| N/A | No | Dialogue | E: "well if you're feeling lazy, go out on a rainy day… they start at about 9" |
| N/A | No | Dialogue Button(s) | "That makes all the difference" |
| Tap | No | Choose Dialogue Button | "That makes all the difference" |
| N/A | No | Dialogue | E: "now get back out there on water level duty - and apparently there are some new food items to find as well" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to | |

| | | Scan | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Katiau |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Katiau |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "thanks kailan!" |
| N/A | No | Dialogue | E: "I still think it's amazing Wildiverse can pickup singing" |
| N/A | No | Dialogue Button(s) | "How do gibbons learn to sing, then?" |
| Tap | No | Choose Dialogue Button | "How do gibbons learn to sing, then?" |

Sindelar 483

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "well, Chilli learned from his dad, Captain" |
| N/A | No | Dialogue | E: "Chili's sister Cynthia learned from their mum, Coklat" |
| N/A | No | Dialogue Button(s) | "Er… their names all start with 'c'" |
| Tap | No | Choose Dialogue Button | "Er… their names all start with 'c'" |
| N/A | No | Dialogue | E: "yeah chilli's part of the 'c' gibbon group, so… all called by 'c' names" |
| N/A | No | Dialogue | E: "I don't know what we'll do when chilli leaves home and starts a family [strong arm emoji]" |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "he spends a lot of his time exploring away from his family (and getting lost) - that's what you're seeing" |
| N/A | No | Dialogue | E: "and one day he'll have to teach his 'I'm lost' song to his son [cry face emoji]" |
| N/A | No | Dialogue | A: "I'm strangely moved" |
| N/A | No | Dialogue | A: "Even more new fruit being detected by Wildiverse now - kailan can you check them out?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |

| Tap | No | Ready Button | Move to Next Stage |
|---|---|---|---|
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jambu Burung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jambu Burung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Butterfly Trap |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lunuk Bunyer |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Leaf Handkerchief |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lunuk Bunyer |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |

| N/A | No | Dialogue | A: "Thanks kailan - these new fruits are all gibbon favourites aren't they Eka?" |
|---|---|---|---|
| N/A | No | Dialogue | E: "they are! How are you getting on with Chilli kailan?" |
| N/A | No | Dialogue Button(s) | Does he mind me just following him around everywhere?" |
| Tap | No | Choose Dialogue Button | Does he mind me just following him around everywhere?" |
| N/A | No | Dialogue | E: "well. Chilli had to get used to us, just like Fio did" |
| N/A | No | Dialogue | E: "(tho he's the first gibbon we tracked since he was a baby)" |
| N/A | No | Dialogue | E: "we just listen out for songs, find gibbons, and then quietly follow them" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | E: "a bit more each day until we're just like… forest furniture to them. Here's a note about it: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "just takes patience" |
| N/A | No | Dialogue Button(s) | "I can be patient" |
| N/A | No | Choose Dialogue Button | "I can be patient" |
| N/A | No | Dialogue | A: "Hey Eka - can kailan help with your grant thing?" |
| N/A | No | Dialogue | E: "YES!" |
| N/A | No | Dialogue | E: "we're applying for money from an international conservation body [three money bags]" |
| N/A | No | Dialogue | E: "so basically we need data… like loads of fresh juicy data" |
| N/A | No | Dialogue Button(s) | "What shall I keep an eye out for?" |
| N/A | No | | "What shall I keep an eye out for?" |
| N/A | No | Dialogue | E: "everything… fruit, litter, and gibbon [poop emoji] |
| N/A | No | Dialogue Button(s) | "I LOVE GIBBON [poop emoji]" |
| N/A | No | Choose Dialogue Button | "I LOVE GIBBON [poop emoji]" |
| N/A | No | Dialogue | A: "Excellent - here's a mission for you then!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildli… | |

Is the implication that people here are also the problem?

Sindelar 487

| Tap | No | Select Wildiverse Tab | |
| --- | --- | --- | --- |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Manggis Hutan |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Manggis Hutan |
| Tap | Yes | Scan Button | Orangutan Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Air Quality Meter |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | A: "Hey you two… all good? | |
| N/A | No | Dialogue Button(s) | "I found that air quality meter! Is that useful?" | |
| N/A | No | Choose Dialogue Button | "I found that air quality meter! Is that useful?" | |
| N/A | No | Dialogue | E: "it is! The smoke stops gibbons from singing…" | |
| N/A | No | Dialogue | E: "they simply can't get enough air to sing in this haze" | Not visualized |
| N/A | No | Dialogue | E: "and if they don't sing, their basic social like is kinda compromised…" | |
| N/A | No | Dialogue | E: "they can't find mates, they can't sing to mark their territory…" | |
| N/A | No | Dialogue | E: "so… are you ready to get some water level; measurements? | |
| N/A | No | Dialogue Button(s) | "YES… but why?" ; "I'd rather focus on my poo collection… so why?" ; "Do I actually have a choice?" | |
| N/A | No | Choose Dialogue Button | YES… but why? | |
| N/A | No | Dialogue | E: "great!" | |
| N/A | No | Dialogue | E: "this forest is all about water" | |
| N/A | No | Dialogue | E: "but when people cut down trees" | |
| N/A | No | Dialogue | E: "they build canals to float the logs out" | |
| N/A | No | Dialogue | E: "remember us talking about that?" | |
| N/A | No | Dialogue | E: "those canals drains the forest floor… which is all peat" | typo |
| N/A | No | Dialogue | E: "and dry peat burns and burns [five fire emojis]" | |
| N/A | No | Dialogue | E: "so - I want to see if we can get a measure of the fire risk" | Not visualized |
| N/A | No | Dialogue | E: "can you find some more water level readings, and check up on the peat itself? | |

Sindelar 489

| | | | |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Branch |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Peat Probe |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Peat Probe |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "hey" |
| N/A | No | Dialogue Button(s) | "hey hey hey" |

| | | | |
|---|---|---|---|
| N/A | No | Choose Dialogue Button | "hey hey hey" |
| N/A | No | Dialogue | E: "thanks for getting those scans" |
| N/A | No | Dialogue | E: "we build lots of dams to stop the canals drying out the forest floor" |
| N/A | No | Dialogue | E: "is the peat dries up and the trees can't get nutrients, the trees die" |
| N/A | No | Dialogue | E: "and if they go, then the whole ecosystem takes a hit" |
| N/A | No | Dialogue | E: "…" |
| N/A | No | Dialogue | E: "so - all these peat depth and water level readings you're getting help us see if the dams are working" |
| N/A | No | Dialogue | E: "and understand the risk of fire" |
| N/A | No | Dialogue | E: "and speaking of which… there's more smoke in the air today" |
| N/A | No | Dialogue | E: "a lot of burning somewhere [sad face emoji]" |
| N/A | No | Dialogue | E: "it's hard for all the animals" |
| N/A | No | Dialogue Button(s) | "You OK? |
| N/A | No | Choose Dialogue Button | "You OK? |
| N/A | No | Dialogue | E: "yeah" |
| N/A | No | Dialogue | E: "sad though" |
| N/A | No | Dialogue | E: "but we keep going" |
| N/A | No | Dialogue Button(s) | "YES,LET'S GO. More gibbon poo please!" ; "I feel like that sometimes" ; "How do you not just give up?" |
| N/A | No | Choose Dialogue Button | How do you not just give up? |
| N/A | No | Dialogue | A: "TBH it's totally normal to feel down sometimes" |
| N/A | No | Dialogue | A: "But knowing that we are doing our bit to |

| | | | make things better, in whichever we can…" |
|---|---|---|---|
| N/A | No | Dialogue | A: "That's what keeps me going, anyway" |
| N/A | No | Dialogue | A: "And so - I've got more for you to do! [robot emoji] |
| N/A | No | Dialogue | A: "W need some gibbon poo and some air quality readings for some tests we're running" |
| Tap | No | Accept Mission | Move to Next Stage |

| Tap | No | Select Wildiverse Tab | |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Air Quality Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gibbon Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ponak |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Ponak |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Ponak |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Air Quality Meter |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "thanks for all this gibbon [poop emoji] and air quality data" |
| N/A | No | Dialogue Button(s) | "pleasure" |
| N/A | No | Choose Dialogue Button | "pleasure" |
| N/A | No | Dialogue | E: "there is method to our madness" |
| N/A | No | Dialogue | E: "see - we think there's a link between the amount of smoke in the air…" |
| N/A | No | Dialogue | E: "and cortisol levels in gibbon [poop emoji]" imagining an animal's stress and then referencing the immediate life/place of the user |
| N/A | No | Dialogue | E: "(when there's smoke, the gibbons are stressed, in other words" |
| N/A | No | Dialogue | E: "how's the air where you live |
| N/A | No | Dialogue Button(s) | "It's great. Fresh air every day!" ; "It's not good. So much pollution..." ; "I never think about it. I just breathe it" |
| N/A | No | Choose Dialogue Button | "It's great. Fresh air every day!" |
| N/A | No | Dialogue | E: "you're super lucky" |
| N/A | No | Dialogue | E: "it's something we can easily take for granted" |
| N/A | No | Dialogue | E: "very cool that you appreciate what you |

| | | | |
|---|---|---|---|
| | | | have" |
| N/A | No | Dialogue | E: "check out this site - real time air quality readings from all over the world https://waqi.info" |
| N/A | No | Dialogue | E: "anyway - this data you've found has given us enough data for out grant application…" |
| N/A | No | Dialogue | E: "let's see what happens… we'll know soon…" |
| N/A | No | Dialogue | A: "Well done Eka. And you kailan" |
| N/A | No | Dialogue | A: "Now get back in there and see how Chilli is coping. Would be good to know that he's finding enough fruit" |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Webbing Bridge |
| Tap | Yes | Scan Button | Water Level Meter |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lilin Lilin |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Lilin Lilin |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Hey everyone… about this grant application…" |
| N/A | No | Dialogue Button(s) | "Fingers crossed" |
| N/A | No | Choose Dialogue | "Fingers crossed" |

| | | Button | | |
|---|---|---|---|---|
| N/A | No | Dialogue | E: "FORGET THE GRANT I JUST WANT TO BE SOMEWHERE DRY" | |
| N/A | No | Dialogue | E: "kailan your water level scans remind me" | |
| N/A | No | Dialogue | E: "living in a swamp is cool and all" | |
| N/A | No | Dialogue | E: "but the camp's made of wood" | |
| N/A | No | Dialogue | E: "everything rots and rusts in minutes" | |
| N/A | No | Dialogue | E: "and today? i've basically had enough of fixing things [pick axe emoji]" | showing humanity |
| N/A | No | Dialogue | A: "Ha ha! Oh dear" | |
| N/A | No | Dialogue | E: "Is that little train track still OK?" | |
| N/A | No | Dialogue | E: "yeah we fixed all the rotting supports yesterday.." | |
| N/A | No | Dialogue | E: "without the train, the only way to basecamp is by boat" | |
| N/A | No | Dialogue | E: "and even the boats are rotting, it's kind of impressive tbqh" | |
| N/A | No | Dialogue | A: "Do you want to know what else is impressive?" | |
| N/A | No | Dialogue | E: "What?" | |
| N/A | No | Dialogue | A: "WE GOR THE GRANT EKA [money bag emoji]" | |
| N/A | No | Dialogue Button(s) | "LET'S SPEND IT ON A REALLY BIG PARTY" | |
| N/A | No | Choose Dialogue Button | "LET'S SPEND IT ON A REALLY BIG PARTY" | |
| N/A | No | Dialogue | E: "[shocked face emoji] That's amazing Amyra! [clap emoji and happy face emoji]" | |
| N/A | No | Dialogue | E: "but no kailan let's not do that, let's spend it on..." | |
| N/A | No | Dialogue | E: "new boots, jackets, GPS units" | |
| N/A | No | Dialogue | E: "and let's fix the boats before they sink" | |
| N/A | No | Dialogue Button(s) | "Oh" | |
| N/A | No | Choose Dialogue | "Oh" | |

| N/A | No | Button Dialogue | E: "Yeah. It's rare to get a grant we can just spend on basics like these" |
|-----|----|----|----|

| | | | |
|---|---|---|---|
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | E: "yeah…" |
| N/A | No | Dialogue | E: "let's celebrate… but first we need to make sure everything is nice and tidy…" |
| N/A | No | Dialogue | E: "…and I think I saw some trash out there with your name on it kailan" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Bottles |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Boot |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "well, we're obviously seeing a lot of litter still" |
| N/A | No | Dialogue Button(s) | "What does it belong to?" |
| N/A | No | Choose Dialogue Button | "What does it belong to?" |
| Tap | No | Dialogue | A: "People taking a shortcut to work at a palm oil plantation? [red angry face]" |
| Tap | No | Dialogue | A: "Palm oil is basically evil" |
| Tap | No | Dialogue | E: "well… not... quite... It's kind of complicated…" |
| Tap | No | Dialogue | A: "Nah, it's not. Palm oil is the devil [angry face]" |
| Tap | No | Dialogue | E: "oh no. here we go again!" |
| Tap | No | Dialogue | E: "not this argument again lol lol" |
| Tap | No | Dialogue | A: "We have different ideas about palm oil. As you might guess kailan" |
| Tap | No | Dialogue | A: "why don't you get back in while Eka and 'chat'?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | | | |
|---|---|---|---|---|
| | | | target | |
| Tap | Yes | Scan Button | Gibbon Poo | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Katiau | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Katiau | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Katiau | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Rabutan Hutan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Rabutan Hutan | |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | E: "kailan just wanted to say thanks for all this LOVELY DATA" | |
| N/A | No | Dialogue | E: "Fruit and DNA. Fantastic" | |
| N/A | No | Dialogue Button(s) | "Cool. But I'm confused. Is palm oil evil or not?" | |
| N/A | No | Choose Dialogue Button | "Cool. But I'm confused. Is palm oil evil or not?" | |
| N/A | No | Dialogue | E: "evil? nah, local economy would collapse without it" | |
| N/A | No | Dialogue | E: "and then it would be a free-for-all in the forest, clearing trees & hunting - like before" | Are they not evil for creating such a power dynamic? |
| N/A | No | Dialogue | E: "so… it's not ideal but it's not 'evil;, like eeeevil evil [upside down smile face]" | |
| N/A | No | Dialogue | A: "TOTALLY evil: in Borneo oil palm plantations are…" | |
| N/A | No | Dialogue | A: "#1 cause of deforestation" | |

Sindelar 500

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | A: "#1 cause of species loss" | |
| N/A | No | Dialogue | A: "#1 cause of environmental damage [angry face emoji]" | |
| Tap | No | Collect Button | Journal Entry | |
| N/A | No | Dialogue | E: "but the alternatives are… basically worse" | |
| N/A | No | Dialogue | E: "so what are you going to do?" | What is the Indigenous take on this? What can ACTUALLY be done? |
| N/A | No | Dialogue | E: "best thing is to find places to grow the oil palms responsibly, right?" | |
| N/A | No | Dialogue | A: "Hmm… what do you think kailan?" | |
| N/A | No | Dialogue Button(s) | "I'm with you Amyra. I avoid anything that says "palm oil" on it" ; "I still don't know what you're talking about. "Palm oil"???" ; "I get that it can be bad | Weird options |
| N/A | No | Choose Dialogue Button | "I'm with you Amyra. I avoid anything that says palm oil" on it" | |
| N/A | No | Dialogue | A: "[first emoji]" | |
| N/A | No | Dialogue | A: "but seriously, like so many things, it's not black and white" | |
| N/A | No | Dialogue | A: "I'm not sure we'll ever resolve it really" | |
| N/A | No | Dialogue | A: "Johannes was working on some interesting projects at the zoo about it though - right Johannes?" | |
| N/A | No | Dialogue | J: "I have been summoned! Yes, we made Chester the first Sustainable Palm Oil City in the WORLD [world emoji]" | |
| N/A | No | Dialogue | J: "We got loads of organizations committing to sustainable palm oil" | |
| N/A | No | Dialogue | J: "We get loads of organizations committing to sustain palm oil" | |
| N/A | No | Dialogue | J: "We're trying to influence people at HOME to conserve life OUT THERE" | |
| N/A | No | Dialogue | A: "Oh wow - I didn't know it was that big" | |
| N/A | No | Dialogue | J: "It's quite huge actually!" | |
| N/A | No | Dialogue | J: "kailan - here are some things you can do too: https://www.chesterzoo.org/what-you-can-do" | |

N/A     No     Dialogue     J: "And you DON'T have to live in Chester!
N/A     No     Dialogue     E: "[star eyes emoji]"

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | A: "When you're done with that kailan, can you go in and get some more air readings for us?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Peat Probe |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kairnat |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap Phone died | Yes | Scan Button | Kairnat |
| Tap | No | Select | |

| | | Wildiverse Tab | |
|---|---|---|---|
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Peat Probe |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chilli |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kairnat |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kairnat |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Manggis Hutan |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Manggis Hutan |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jetutong |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| | | | target |
| Tap | Yes | Scan Button | Jetutong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Air Quality Meter |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | E: "thanks kailan - great air quality data!" |
| N/A | No | Dialogue | E: "hey - speaking of air quality - funny thing happened in town lol" |
| N/A | No | Dialogue Button(s) | "What?" |
| N/A | No | Choose Dialogue Button | "What?" |
| N/A | No | Dialogue | E: "I went to a school to see how the haze is affecting everyone." |
| N/A | No | Dialogue | E: "asked if they wonder why sometimes they can't hear the gibbons singing" |
| N/A | No | Dialogue | E: "and one of the parents, lives right next to the forest" |
| N/A | No | Dialogue | E: "who hears gibbons singing everyday..." |
| N/A | No | Dialogue | E: "didn't they+D3230 what was making the sound [shocked emoji]" |
| N/A | No | Dialogue Button(s) | "Seriously?" |
| N/A | No | Choose Dialogue Button | "Seriously?" |
| N/A | No | Dialogue | E: "srsly" |
| N/A | No | Dialogue | E: "but look, not everyone here understands this treasure" |
| N/A | No | Dialogue | E: "right on their doorstep, no where else in the world" |
| N/A | No | Dialogue | E: "so part of my job is showing people" |

Sindelar 505

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | E: "that what they've got is unique" | I'm sure important, but a bit savior-y. also v true of most place |
| N/A | No | Dialogue | E: "if we can get everyone to value it, then this place will be safe" | this puts undue blame on the most marginalized groups |
| Tap | No | Collect Button | Journal Entry | |
| N/A | No | Dialogue | A: "kailan we've got a big mission for you now." | |
| N/A | No | Dialogue | A: "before we send you back to the Congo" | |
| N/A | No | Dialogue | A: "Do you, or do you not, accept?" | |
| Tap | No | Accept Mission | Move to Next Stage | |
| Tap | No | Select Wildiverse Tab | | |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Air Quality Meter | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Gibbon Poo | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |

| Tap | Yes | Scan Button | Chili |
|-----|-----|-------------|-------|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Orangutan Poo |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Papong |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Butterfly Trap |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | A: "Mission complete kailan. Borneo salutes you" |
| N/A | No | Dialogue Button(s) | "I am ready for more. Bring me more animals" |
| N/A | No | Choose Dialogue Button | "I am ready for more. Bring me more animals" |
| N/A | No | Dialogue | Es: "You sound like a Roman emperor on his birthday but OK." |
| N/A | No | Dialogue | E: "hi Espoir!" |
| N/A | No | Dialogue | Es: "how is it going in the Congo?" |
| N/A | No | Dialogue | Es: "It's humid. It's alive. Leaves are rusting. Sweat bees are buzzing." |
| N/A | No | Dialogue | Es: "We do not have 4G. Or indeed walls." |
| N/A | No | Dialogue | Es: "But for the next few months it's home." |
| N/A | No | Dialogue | Es: "& kailan as soon as Amyra gets your update ready, it's time to meet someone new." |
| N/A | No | Dialogue | A: "It's just processing now, won't be long [clock emoji]" |
| N/A | No | Dialogue | Es: "OK." |
| N/A | No | Dialogue | Es: "kailan while we wait, I'm curious." |
| N/A | No | Dialogue | Es: "What do you think about the life of a wildlife researcher so far? Would you want to do it? |
| N/A | No | Dialogue Button(s) | "Jungles, bags of dung. Biting things. Nuh uh, no. Nope. No." ; "I think so… but I'm not sure I have what it takes..." ; "Yes, I'd love to!" |
| N/A | No | Choose Dialogue Button | "I think so… but I'm not sure I have what it takes..." |
| N/A | No | Dialogue | Es: "I'm sure you do kailan" |
| N/A | No | Dialogue | A: "And it's never too late. Whether you're still in school or you've had a long career, there is always room for one more! [smile emoji]" |
| N/A | No | Dialogue | Es: "and now…" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "IT'S PROCESSED AND READY [glasses emoji]" |
| N/A | No | Dialogue | Es: "OK. Kailan meet Aida! Here's the journal data: |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "Aida is, & I cannot stress this enough, a chimpanzee" |
| N/A | No | Dialogue | Es: "She's 15, she likes being groomed & socializing." |
| N/A | No | Dialogue | Es: "And - like our friends, Fio, Buka, and Chilli - she loves fruit." |
| N/A | No | Dialogue | Es: "So… get back into Congo and find her! |
| Tap Aida | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Litter - Plastic Food Container |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "So. What do you think of chimpworld?" |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue Button(s) | "I think I made a friend today" |
| N/A | No | Choose Dialogue Button | "I think I made a friend today" |
| N/A | No | Dialogue | Es: "Chimps are the best. You can totally see that they're our closest living relatives. With bonobos." |
| N/A | No | Dialogue | Es: "Aida lives in a community of about 50 others, called the 'Moto' community." |
| N/A | No | Dialogue | Es: "She joined from another community… probably because she had problems with the other females." |
| N/A | No | Dialogue | Es: "I totally respect t her. She had to work her way up from the bottom rung after she joined. |
| N/A | No | Dialogue Button(s) | "I'm getting that ape reality TV vibe again." |
| N/A | No | Choose Dialogue Button | "I'm getting that ape reality TV vibe again." |
| N/A | No | Dialogue | Es: "100%! Just wait and see. And listen to them too. They can really talk your ear off." |
| N/A | No | Dialogue | Es: "We've been studying the community for 25 years and there's always something new." |
| N/A | No | Dialogue | A: "kailan. I'm afraid Wildiverse only has bandwidth to track individuals at the moment" |
| N/A | No | Dialogue | Es: "But if you have to pick one to follow, then Aida's the best choice! |
| N/A | No | Dialogue | Es: "Actually, could you get in and see what her movements are? Some food she's eating will tell us a lot." |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |

| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
|-----|-----|---------------------|-------------------------------------------|
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Fusa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Bangi |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "You appear to have found a feast!" |
| N/A | No | Dialogue Button(s) | "Yes! Lots of gorilla food, right?" |
| N/A | No | Choose Dialogue Button | "Yes! Lots of gorilla food, right?" |
| N/A | No | Dialogue | Es: "That's not just food for gorillas… chimps & gorillas eat a lot of the same things." |
| N/A | No | Dialogue | Es: "Chimps really like fruit, & termites, if they're around." |
| N/A | No | Dialogue | Es: "& we've even seen them hunt small antelope. Here's a note for you!" |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "Are you surprised chimpanzees eat meat?" |
| N/A | No | Dialogue Button(s) | "Nothing surprises me anymore after Wildiverse" ; "No way! You learn something new every day" ; "YOU LIE. CHIMPANZEES ARE MILITANT VEGANS" |
| N/A | No | Choose Dialogue Button | "No way! You learn something new every day" |
| N/A | No | Dialogue | Es: "So trust me, chimps are omnivores. Meat, fruit, leaves, insects, honey…" |
| N/A | No | Dialogue | Es: "Although their favourite food is fruit." Especially figs, judging by Aida." |
| N/A | No | Dialogue | Es: "& there's so much fruit here that they can't really be bothered to hunt." |
| N/A | No | Dialogue | Es: "But we've finally detected some nests and would really love some recent data on the Moto community!" |
| N/A | No | Dialogue | Es: "Can you exercise your genius for nest-finding?" |
| Tap | No | Accept | Move to Next Stage |

| | | | |
|---|---|---|---|
| Tap | No | Mission Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Jackpot. There's the nests I was after! That's where the chimps slept last night." |
| N/A | No | Dialogue Button(s) | "Chimps plural?" |
| N/A | No | Choose Dialogue Button | "Chimps plural?" |
| N/A | No | Dialogue | Es: "Oui! Well, some of them." |
| N/A | No | Dialogue | Es: "The community splits up & re-emerges all the time." |
| N/A | No | Dialogue | Es: "We call it a fission-fusion society. Here's a little |

note about them: "

| | | | |
|---|---|---|---|
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "The entire community is never in the same place." |
| N/A | No | Dialogue | Es: "Might be months before Aida will see some of the other members of the group." |
| N/A | No | Dialogue Button(s) | "So chimpanzees live in trees then?" |
| N/A | No | Choose Dialogue Button | "So chimpanzees live in trees then?" |
| N/A | No | Dialogue | Es: "Well, partially." |
| N/A | No | Dialogue | Es: "They actually spend a lot of time on the ground." |
| N/A | No | Dialogue | Es: "They do most of their movement on the forest floor." |
| N/A | No | Dialogue | Es: "But Aida will spend all day up a fig tree eating if she can. Chimps heart figs." |
| N/A | No | Dialogue | Es: "Let's see what other snacks they heart." |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Walk | Yes | Tap + Hold | Yes - but problems decreased it |

Moved toward closest object via the

| Button | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | button. This still required turning my body around, upward, and downward. Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Antiaris |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mboto |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Fusa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Fusa |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Botunga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Botunga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Antiaris |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Antiaris |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue | Shows summary of points earned and leaves Wildiverse |

responsibility

Sindelar 517

| | | | |
|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "nice researching!" |
| N/A | No | Dialogue Button(s) | "If you want nest data, I'm the alpha nest-spotter" |
| N/A | No | Choose Dialogue Button | "If you want nest data, I'm the alpha nest-spotter" |
| N/A | No | Dialogue | Es: "you are! & speaking of alpha, you've just identified Mark's nest." |
| N/A | No | Dialogue | Es: "He is the alpha male in these parts. Where he goes, the other chimps follow" |
| N/A | No | Dialogue Button(s) | "The alpha community of the Moto community is called 'Mark'?" |
| N/A | No | Choose Dialogue Button | "The alpha community of the Moto community is called 'Mark'?" |
| N/A | No | Dialogue Button(s) | "You should have called him…" |
| N/A | No | Choose Dialogue Button | "You should have called him…" |
| N/A | No | Dialogue Button(s) | "Thor" ; "Chimp Diesel" ; "GREAT CHAD CHIMPAZOID THE MIGHTY FIG-EATER OF MOTO, PRAISE HIM, PRAISE HIM" |
| N/A | No | Choose Dialogue Button | "Chimp Diesel" |
| N/A | No | Dialogue | Es: "It is true. Quite a terrible name for an alpha male." |
| N/A | No | Dialogue | Es: "Well, I would pay to see Chimp Diesel on the big screen, certainly" |
| N/A | No | Dialogue | Es: "Either way , chimpanzees are very much into status. Status is everything." |
| N/A | No | Dialogue | Es: "You can see this by who's grooming who, & who's eating what." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "The Moto community is like a moving, eating, napping, village with neighborhoods that continually split & re-join according to changing alliances, & food." |
| N/A | No | Dialogue | Es: "Mark's in charge. But he has to be super political to stay in charge." |
| N/A | No | Dialogue | Es: "Even he needs to form alliances to keep his place on top. Here's a note about it: " |
| N/A | No | Dialogue | Es: "Anyway kailan: another mission for you!" |
| N/A | No | Dialogue | Es: "We've detected a rare paring… go and scan some samples for us!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |

| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
|-----|-----|---------------------|-------------------------------------------|
| Tap | Yes | Scan Button | Bokoko |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bokoko |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bokoko |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Gorilla dung & chimpanzee dung together!" |
| N/A | No | Dialogue Button(s) | "Is that your 'rare paring'?" |
| N/A | No | Choose Dialogue Button | "Is that your 'rare paring'?" |
| N/A | No | Dialogue | Es: "Oui." |
| N/A | No | Dialogue | Es: "The Goualougo Triangle is the only place in the world where we've observed chimps and gorillas feeding |

| | | | |
|---|---|---|---|
| | | | together at the same tree." |
| N/A | No | Dialogue | Es: "Actually, it's the best chance you'll have to see chimps and gorillas on the same day." |
| N/A | No | Dialogue | Jo: "Cough zoo cough" |
| N/A | No | Dialogue | Es: "Return of the Jodi!" |
| N/A | No | Dialogue | Es: "Pardon - on the same day in the wild." |
| N/A | No | Dialogue | Es: "Extrapolate the dugout canoe for tool use in chimpanzees or kailan will speak to gibbon trees; or kailan before sunset on the large tool use;;;" |
| N/A | No | Dialogue | Es: "Mon dieul! It's alive." |
| N/A | No | Dialogue | A: "Already on it Espoir [glasses face emoji]" |
| N/A | No | Dialogue | A: "I'm calibrating Wildiverse to the satellite phone, kailan" |
| N/A | No | Dialogue | A: "Give me a few minutes - it won't get away this time!" |
| N/A | No | Dialogue | Es: "& kailan , if we're looking for techy chimps, here are some items that might lead us in the right direction. I'll explain later…" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|-----|-----|-----------------------|-----------------------------------------|
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| Tap | Yes | Scan Button | Bangi Leaves | |
|-----|-----|-------------|--------------|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Bullets | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Termite Fishing probe | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Termite Fishing probe | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Bangi | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Club Stick | |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| Tap | Yes | Continue Button | Es: "Excellent spots!" | |
| N/A | No | Choose Dialogue Button | OK, what does this mean? Chewed stick, stick that looks like a club?" | |
| N/A | No | Choose Dialogue Button | OK, what does this mean? Chewed stick, stick that looks like a club?" | Juxtaposition of this and bullets |
| Tap | Yes | Continue Button | Es: "This, kailan, is chimp technology!" | |
| Tap | Yes | Continue Button | Es: "The sweat bees in this forest make honey." And the chimps like honey." | |
| Tap | Yes | Continue Button | Es: "So they use tools to get it! Lot's of tools." | |
| Tap | Yes | Continue Button | Es: "They'll bang the nests with clubs for literally hours until they break." | |

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Continue Button | Es: "& then they'll use thin tools to extract the honey." | |
| Tap | Yes | Continue Button | Es: "They'll even make clubs beforehand and store them for later." | |
| Tap | Yes | Continue Button | Es: "extrapolate tool gorilla kailan in a dugout canoe tools;;;" | |
| Tap | Yes | Continue Button | A: "Quick!!! I think I've isolated a signal from that phone…" | |
| Tap | Yes | Continue Button | A: "I think I've isolated a signal from that phone…" | |
| Tap | Yes | Continue Button | Es: "patching that area to you know kailan…" | |
| Tap | Yes | Continue Button | Es: "Oh! Go in and locate it!" | So am I fetching a physical object??? |
| Tap | No | Accept Mission | Move to Next Stage | |
| Tap | No | Select Wildiverse Tab | | |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Boboko Stem | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |

Sindelar 524

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Scan Button | Boboko Stem | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Chimp Nest | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Chimp Nest | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Satellite Phone | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Chimp Nest | |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | A: "You found the satellite phone! Sending exact coordinates by dm Espoir..." | Okay, so I did not have a physical effect |
| N/A | No | Dialogue Button(s) | "Espoir, you can stop doing the washing up!" | |
| N/A | No | Choose Dialogue Button | "Espoir, you can stop doing the washing up!" | |
| N/A | No | Dialogue | Es: "Merci, merci, merci! Fantastique!" | |
| N/A | No | Dialogue | A: "DNA says it was under a nest belonging to a chimp Espoir calls Theresa" | |
| N/A | No | Dialogue | Es: "Theresa's daughter must have been playing with it." | |
| N/A | No | Dialogue | Es: "She's two and a half. And very sweet." | Feels very human |
| N/A | No | Dialogue Button(s) | "No more chimp texts? I'm actually sad" | |
| N/A | No | Choose Dialogue Button | "No more chimp texts? I'm actually sad" | INTERESTING SPECULATION AND OBSERVATION. CURIOSITY FOR COMMUNICATION |
| N/A | No | Dialogue | Es: "If chimpanzees sent texts, it would be CAN I PICK STUFF FROM YR FUR PLS" | |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "GO AWAY 4 EVER CHIMP DEISEL I AM BOSS CHIMP NOW LOL" |
| N/A | No | Dialogue | Es: "WHY DO ALL THESE LOGGERS CHOP DOWN THE BEST FOOD TREES confused face emoji" |
| N/A | No | Dialogue | Es: "I've heard distinct calls for happiness, danger, anger." |
| N/A | No | Dialogue | Es: "& they cheer when they're in a tree with a lot of good fruit!" |
| N/A | No | Dialogue | A: "And Espoir - I think this is a tool hotspot… if you can find some more tools that would be great!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Termite Mound |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Termite Fishing probe |
| N/A | Yes | "Connecting to Location" | Loading Message |

| | | | |
|---|---|---|---|
| Tap | Yes | OK Button - Things to Scan | Fusa |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Fusa |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Aida |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Termite Fishing probe |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Termite Fishing probe |

| | | | |
|---|---|---|---|
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Elephant Dung |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Club Stick |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | Club Stick |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "We need to add 'chimpanzee tool expert' to your CV" |
| N/A | No | Dialogue Button(s) | "I'm going to start a blog on chimp tech" |
| N/A | No | Choose Dialogue Button | "I'm going to start a blog on chimp tech" |
| N/A | No | Dialogue | A: "This chewed stick…. this opened termite mound" |
| N/A | No | Dialogue | A: "Even I can see what's happening here" |
| N/A | No | Dialogue | Es: "Indeed. Chimps fray one end of the stick and use it to fish for termites." |
| N/A | No | Dialogue | Es: "Chimpanzees are some of the only creatures on earth that modify tools." |
| N/A | No | Dialogue | Es: "True engineers. Here's a note about them: " |
| Tap | No | Collect Button | Journal Entry |
| N/A | No | Dialogue | Es: "That chewed stick is literally technology made |

| | | | from forest materials." |
|---|---|---|---|
| N/A | No | Dialogue | Es: "I have seen Aida use leaves as a sponge to soak up water from holes in a tree" |
| N/A | No | Dialogue | Es: "I've even seen her use a stick to wedge open gboyo fruit to get the seeds." |
| N/A | No | Dialogue | A: "Speaking of amazing tech..." |
| N/A | No | Dialogue | A: "There's some evidence of human activity coming up..." |
| N/A | No | Dialogue | A: "And a vaguely worrying ELPHNT trace..." |
| N/A | No | Dialogue | A: "kailan can you get in there and check it out?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Elephant Dung |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Campfire |

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Finish Now Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| N/A | No | Dialogue | Es: "I hope you're not too anxious scanning ELPHNT dung." | |
| N/A | No | Dialogue Button(s) | "Not the Wildiverse kind!" | |
| N/A | No | Choose Dialogue Button | "Not the Wildiverse kind!" | |
| N/A | No | Dialogue | Es: "It's really fine, even in reality." | |
| N/A | No | Dialogue | Es: "As long as there's someone keeping a lookout." | |
| N/A | No | Dialogue | Es: "Elephants are also extremely useful. They create 'highways' through the forest." | |
| N/A | No | Dialogue | Es: "Which helps other animals move around & researchers too." | |
| N/A | No | Dialogue | Es: "The campfire, though… oh dear…" | |
| N/A | No | Dialogue | Es: "kailan as a chimp technology expert, what is your diagnosis?" | |
| N/A | No | Dialogue Button(s) | "Chimps make fires. I knew it" ; "Chimps cook antelope and fruit kebabs. I knew it" ; "Chimps sit around telling stories about fruit. I knew it" | Terrible options |
| N/A | No | Choose Dialogue Button | "Chimps sit around telling stories about fruit. I knew it" | |
| N/A | No | Dialogue | Es: "No. This is humans. For bushmeat or ivory." | |
| N/A | No | Dialogue | Es: "Many people don't have very much & this forest is a reserve of free protein." | Weird omission of the fact you don't need meat for protein |
| N/A | No | Dialogue | Es: "Chimpanzee numbers are healthy here." | |
| N/A | No | Dialogue | Es: "But when I see signs of hunters from outside the forest." | |
| N/A | No | Dialogue | Es: "I just. Well you know. I have to stay busy. Keep my mind off it." | Dealing with eco trauma |
| N/A | No | Dialogue | A: "You're doing great Espoir." | |
| N/A | No | Dialogue | Es: "kailan how about a mission? Some more human | |

technology to find for us... Congo style: "

| | | | |
|---|---|---|---|
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Weather Station |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Mound |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "There's the weather station. Wonderful." |
| N/A | No | Dialogue Button(s) | "Great" |
| N/A | No | Choose Dialogue Button | "Great" |
| N/A | No | Dialogue | Es: "Rain and temperature records really help us put the flowering and fruiting of different plants into context." Again not visualized |
| N/A | No | Dialogue | Es: "Another piece of the puzzle." |
| N/A | No | Dialogue | A: "By the way, these are fresh nests" |
| N/A | No | Dialogue | A: "And lots of freshly eaten figs" |
| N/A | No | Dialogue | Es: "Listen out for happy chimps" |
| N/A | No | Dialogue | Es: "And nest hunter! Do your work! Let's see who's in this part of Moto's community!" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting | Loading Message |

| | | to Location" | |
|---|---|---|---|
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |

| Tap | No | Ready Button | Move to Next Stage |
|---|---|---|---|
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Yonga |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mwase |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

|       |     |                       | target                                                       |
|-------|-----|-----------------------|--------------------------------------------------------------|
| Tap   | Yes | Scan Button           | Chimp Poo                                                    |
| Tap   | Yes | Find nearest target   | Move around in Wildiverse via Walk Button                    |
| Tap   | Yes | Scan Button           | Chimp Nest                                                   |
| Tap   | Yes | Finish Now Button     | Shows summary of scanned objects                             |
| Tap   | Yes | Continue Button       | Shows summary of points earned and leaves Wildiverse         |
| N/A   | No  | Dialogue              | Es: "kailan, you've still got it"                            |
| N/A   | No  | Dialogue Button(s)    | "Plenty o'nests"                                             |
| N/A   | No  | Choose Dialogue Button| "Plenty o'nests"                                             |
| N/A   | No  | Dialogue              | A: "DNA analysis says Aida's slept here. As well as our chimp friend Theresa" |
| N/A   | No  | Dialogue              | A: "And so did Chimp Diesel, or whatever we're calling Mark now" |
| N/A   | No  | Dialogue              | Es: "Interesting!"                                           |
| N/A   | No  | Dialogue Button(s)    | "Chimp reality TV time, I'm guessing"                        |
| N/A   | No  | Choose Dialogue Button| "Chimp reality TV time, I'm guessing"                        |
| N/A   | No  | Dialogue              | Es: "That is correct. You know how chimps are really status-oriented?" |
| N/A   | No  | Dialogue              | Es: "Well, all newcomers are low status, & Aida's a newcomer to the Moto community, relatively." |
| N/A   | No  | Dialogue              | Es: "Theresa was the dominant female when Aida came."        |
| N/A   | No  | Dialogue              | Es: "But Aida is a serious chimp!"                           |
| N/A   | No  | Dialogue              | Es: "She established herself in no time."                    |
| N/A   | No  | Dialogue              | Es: "In fact, she is the dominant female in her party now. Here's a note about her: " |
| Tap   | No  | Collect Button        | Journal Entry                                                |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "Theresa now grooms Aida rather than the other way around." |
| N/A | No | Dialogue Button(s) | "That's my chimp" |
| N/A | No | Choose Dialogue Button | "That's my chimp" |
| N/A | No | Dialogue | Es: "You know what, let's carry on following Aida to check if she's sticking with Theresa and Chimp Diesel." |
| N/A | No | Dialogue | Es: "I mean Mark." |
| N/A | No | Dialogue | Es: "It's good practice. We often spend all day observing a chimp group." |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Solla |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Solla |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mobel |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Mobel |

Kids are target audience?

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "I mean very wide." |
| N/A | No | Dialogue Button(s) | "You basically live in a nature documentary, Espoir" |
| N/A | No | Choose Dialogue Button | "You basically live in a nature documentary, Espoir" |
| N/A | No | Dialogue | Es: "I love this part of the work. Every 20 minutes we take a behaviour scan." |
| N/A | No | Dialogue | Es: "Your record the behaviour of every animal in sight." |
| N/A | No | Dialogue | Es: "Grooming, playing, feeding, calling." |
| N/A | No | Dialogue | Es: "Sometimes you don't realise what you've recorded until a lot later." |
| N/A | No | Dialogue | Es: "Back when I realised that Theresa was grooming Aida, it was amazing." |
| N/A | No | Dialogue | Es: "It really meant that Aida was on top." |
| N/A | No | Dialogue | Es: "How would you feel about watching chimps all day?" |
| N/A | No | Dialogue Button(s) | "At the moment I actually do?"        Why no other option???? |
| N/A | No | Choose Dialogue Button | "At the moment I actually do?" |
| N/A | No | Dialogue | Es: "Point taken." |
| N/A | No | Dialogue | A: "Not to get all meta… I'm picking up some fishy signs of research activity?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |

| | | | |
|---|---|---|---|
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bangi Leaves |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Sardine Can Fence |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Sardine Can Fence |
| Tap | Yes | Continue Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Oh, mon dieu. The sardine cans!" |
| N/A | No | Dialogue Button(s) | "Sardine cans?" |
| N/A | No | Choose Dialogue Button | "Sardine cans?" |
| N/A | No | Dialogue | E: "now kailan you may noe be an expert on tool use in apes" |
| N/A | No | Dialogue | E: "but it my belief that these sardine cans are" |
| N/A | No | Dialogue | E: "they're… er…" |
| N/A | No | Dialogue | E: "Espoir, what are these sardine cans for?" |
| N/A | No | Dialogue | Es: "Eka, where have you been?" |
| N/A | No | Dialogue | Es: "This is how you know you're at the camp." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "Firstly, we eat an enormous amount of sardines." |
| N/A | No | Dialogue | Es: "Secondly, we do not want elephants walking through when we're having breakfast." |
| N/A | No | Dialogue | Es: "A single elephant can destroy a camp in a matter of minutes." |
| N/A | No | Dialogue | Es: "These sardine cans are an elephant fence." |
| N/A | No | Dialogue | Es: "The sound scares them off… or at least warns us they are near." |
| N/A | No | Dialogue | Es: "Humans are many things, but of all the apes we're definitely best at tools." |
| N/A | No | Dialogue | E: "unfortunately" |
| N/A | No | Dialogue | Es: "Did you send that from your Xbox via 4G?" |
| N/A | No | Dialogue | A: "Burn" |
| N/A | No | Dialogue | E: "salteeeeee" |
| N/A | No | Dialogue | Es: "Pfff. Some of us have work to do." |
| N/A | No | Dialogue | Es: "For me, that means building a picture of the ape populations here…" |
| N/A | No | Dialogue | Es: "kailan it would help me if you could check in on Aida's movements to get an up-to-date picture of the Moto community size?" |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to | |

| | | Scan | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Gorilla Poo |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Nest |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kakala |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kakala |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Kakala |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Chimp Poo |

| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
|---|---|---|---|---|
| Tap | Yes | Scan Button | Gorilla Poo | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Weather Station | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Chimp Poo | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button | |
| Tap | Yes | Scan Button | Chimp Poo | |
| N/A | No | Dialogue | Es: "This kind of information is priceless, really. Two thumbs up emojis." | |
| N/A | No | Dialogue Button(s) | "kailan the Tracker: Animal Detective" | |
| N/A | No | Choose Dialogue Button | "kailan the Tracker: Animal Detective" | |
| N/A | No | Dialogue | Es: "Chimp poo, nests and half-eaten food really helps us understand the links between the community's size and their environment." | |
| N/A | No | Dialogue | Es: "We can't understand the decline and growth of ape numbers without a baseline!"" | |
| N/A | No | Dialogue | E: "when you start paying attention, I mean, like when you're tracking, the world really changes" | IMPORTANT |
| N/A | No | Dialogue | E: "and then when you start to put the data together and really think about what it means, everything changes in a different way" | |
| N/A | No | Dialogue | E: "it's hard to explain" | |
| N/A | No | Dialogue | Es: "There's a lot to be said for really looking." | |
| N/A | No | Dialogue | Es: "& my parents used to think it was impossible to make a decent living just 'watching chimps'." | |
| N/A | No | Dialogue | Es: "Get out there and prove them wrong!" | rebellious |
| Tap | No | Accept | Move to Next Stage | |

| Tap | No | Mission Select | |
| --- | --- | --- | --- |
| Tap | No | Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Bullets |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |

| | | | |
|---|---|---|---|
| Tap | Yes | Scan Button | Jolo B |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Termite Mound |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Jolo A |
| Tap | Yes | Finish Now Button | Shows summary of scanned objects |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse |
| N/A | No | Dialogue | Es: "Figs! Lots of figs!" |
| N/A | No | Dialogue Button(s) | "Indeed!" |
| N/A | No | Choose Dialogue Button | "Indeed!" |
| N/A | No | Dialogue | Es: "If you could hear chimps in a fruiting tree, they're literally cheering." |
| N/A | No | Dialogue | Es: "In fact I've counted more than 30 different vocalisations." |
| N/A | No | Dialogue | Es: "Happiness. Danger. Anger. Delight." |
| N/A | No | Dialogue | Es: "They can 'chew your ear off'. Smile emoji." |
| N/A | No | Dialogue | A: "I don't want to get all serious, but..." |
| N/A | No | Dialogue | A: "all this tool use, talking, family, and obsession with status kind of making me question the uniqueness of human beings" |
| N/A | No | Dialogue | Es: "Um… wow. Er, Yeah Amyra. Raised fist emoji." |

| | | | |
|---|---|---|---|
| N/A | No | Dialogue | Es: "Yeah. This place puts things into perspective." |
| N/A | No | Dialogue | Es: "All lifeforms are wonderful in their own ways, and everything is linked." |
| N/A | No | Dialogue | Es: "You really want to tell the world. You really want to take action." |
| N/A | No | Dialogue | Es: "Working here, just watching it and leaning, makes me feel like I'm doing that." |
| N/A | No | Dialogue | Es: "The thing about doing something is that it's SOMETHING." |
| N/A | No | Dialogue | A: "kailan, speaking of SOMETHING, I've got a special mission for you. I hope you'll accept it." |
| N/A | No | Dialogue | A: "I'm detecting a large wooden structure - probably man-made" |
| N/A | No | Dialogue | A: "Something is about to happen. See for yourself: " |
| Tap | No | Accept Mission | Move to Next Stage |
| Tap | No | Select Wildiverse Tab | |
| Tap | No | Enter Wildiverse | Move to Next Stage |
| Tap | No | I'm Ready Button | Move to Next Stage |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage |
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |
| Tap | Yes | OK Button - Things to Scan | |
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Dugout Canoe |
| Tap | Yes | Find nearest | Move around in Wildiverse via Walk Button |

|     |     | target      |            |
| --- | --- | ----------- | ---------- |
| Tap | Yes | Scan Button | Chimp Poo  |

| | | | |
|---|---|---|---|
| Tap | Yes | Find nearest target | Move around in Wildiverse via Walk Button |
| Tap | Yes | Scan Button | Aida |
| Tap | Yes | Continue Button | Resumed mission, but then no way to conclude. Restarted the app. |
| N/A | No | Dialogue | Es: "You found it. The dugout canoe. No roads in the forest. Only creeks and rivers. Canoes are essential here." |
| N/A | No | Dialogue Button(s) | "OK!" |
| N/A | No | Choose Dialogue Button | "OK!" |
| N/A | No | Dialogue | E: "thank you" |
| N/A | No | Dialogue | Es: "Merci." |
| N/A | No | Dialogue | A: "Thank you" |
| N/A | No | Dialogue Button(s) | "Everyone's here and saying 'thank you'" |
| N/A | No | Choose Dialogue Button | "Everyone's here and saying 'thank you'" |
| N/A | No | Dialogue Button(s) | "Um… why do I get the feeling this is the end?" |
| N/A | No | Choose Dialogue Button | "Um… why do I get the feeling this is the end?" |
| N/A | No | Dialogue | Es: "Because it is. For now. But something's starting." |
| N/A | No | Dialogue | Es: "That canoe's going t get me to the road." |
| N/A | No | Dialogue | Es: "I'm going to Wildiverse HQ." |
| N/A | No | Dialogue | A: "Espoir's going to help us expand" |
| N/A | No | Dialogue | A: "We're going to be scanning the Arctic. Savannahs. Mountains" |
| N/A | No | Dialogue | A: "Wildiverse is running. It's up. It's calibrated. It's scanning." |
| N/A | No | Dialogue | A: "You helped make this happen" |
| N/A | No | Dialogue | E: "And we couldn't have done this without you basically" |
| N/A | No | Dialogue | E: "So… thank you and see you soon.*" |
| N/A | No | Dialogue | E: "*Please note capital letters. Thank you. |
| N/A | No | Dialogue | Es: "I'm bad at goodbyes." |

| | | | | |
|---|---|---|---|---|
| N/A | No | Dialogue | Es: "So I'll just say 'See you'" | |
| N/A | No | Dialogue | Es: "And don't forget the forests." | |
| N/A | No | Dialogue | A: "So while you're waiting for us (well, me) to update the Wildiverse… what are you going to do?" | |
| N/A | No | Dialogue Button(s) | "I'd like to keep doing what I can to help! What should I do?" ; "I'm happy to take a break! See you all when the next Wildiverse update is ready" ; "I think I'm good. On to the next thing. Good luck everyone!" | |
| N/A | No | Choose Dialogue Button | I'd like to keep doing what I can to help! What should I do? | |
| N/A | No | Dialogue | A: "That's so great to hear [big smile face]" | |
| N/A | No | Dialogue | A: "There really are a lot of ways you can get involved" | |
| N/A | No | Dialogue | A: "Check out the Borneo Nature Foundation and Goualougo Triangle Ape Project sites for ideas about how you can help directly" | |
| N/A | No | Dialogue | A: "And we've put together a list of great ways to help here: www.wildiversegame.com/support-apes" | |
| N/A | No | Dialogue | A: "Thanks kailan" | |
| N/A | No | Dialogue | A: "Bye for now!" | |

Gameplay Log:

| Interactive Object/Being | Camera / Photos | Physical Touch Type | Haptic Visuality | Details |
|---|---|---|---|---|
| Dialogue Box | No | Tap | No | Type name |
| Continue Button | No | Tap | No | |
| Accept Button | No | Tap | No | Accepted Terms of app |
| Dialogue Button | No | Tap | No | "Hi" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| OK Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Things to Scan | | | | |
| Unknown object | Yes | N/A | Yes | Walk toward closest object |
| Unknown object | Yes | Tap | Yes | Open Scan option |
| Scan Button | Yes | Tap | No | Orangutan Poo |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "A bit… I like animals, but don't know much about them" |
| Collect Button | No | Tap | No | Journal item |
| Accept Button | No | Tap | No | Accept mission |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| "Holographic Forest" | Yes | N/A | Yes | Look around |
| Unknown object | Yes | N/A | Yes | Walk around inside |
| Camera Button | Yes | Tap | Yes - Viewing animal inside | Difficult to get photos as I like them because the holographic forest freezes when I look up |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan |
| Fio | Yes | N/A | Yes - Viewing animal inside | I was rotating around to keep the animal in the scanner area, but the holographic forest froze and the animal moved out of range |
| Fio | Yes | N/A | Yes | Walk around inside |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Difficult to get photos as I like them because the holographic forest freezes when I look up |
| Unknown object | Yes | N/A | Yes | Walk closer to object |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes | Open Scan option |
| Scan Button | Yes | Tap | No | Orangutan |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "You are very welcome, Eka" |
| Dialogue Button | No | Tap | No | "So… am I scientist now?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Fio | Yes | N/A | Yes | Walk around inside |
| Scan Button | Yes | Tap | No | Orangutan |
| Fio | Yes | N/A | Yes - but problems decreased it | (again) I was rotating around to keep the animal in the scanner area, but the holographic forest froze and the animal moved out of range |
| Fio | Yes | N/A | Yes - but problems decreased it | Walk around inside |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Difficult to get photos as I like them because the holographic forest freezes when I look up |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Difficult to get photos as I like them because the holographic forest freezes when I look up |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but | Open Scan option |

| | | | problems decreased it | |
| --- | --- | --- | --- | --- |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Yes" |
| Dialogue Button | No | Tap | No | "This is beginning to sound like an '80's arcade game but OK" |
| Accept Button | No | Tap | No | Accept mission |

| | | | | |
|---|---|---|---|---|
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Buhis |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Nyatoh Burung |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jangkang Kuning |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I know!" |
| Dialogue Button | No | Tap | No | "So… if I'm a scientist now, am I doing enough?" |

| | | | | |
|---|---|---|---|---|
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR. This time I tried to get closer to the carpet so that the forest floor would be closer to the actual floor, but it didn't work. |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Bend down to get closer to object; tapping while standing didn't work |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Difficult to get photos as I like them because the holographic forest freezes when I look up |
| Fio | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk around inside. Can't walk to object. Become frustrated because I didn't realize what the Walking Button was/did |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "Thanks!" |
| Dialogue Button | No | Tap | No | "'Nest'? Are we orang-o'tangs birds then?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - You | No | Tap | No | Tried tapping card for more details. Not responsive. |
| Journal Tab - Team | No | Tap | No | Only shows Amyra and Eka and "Three more to unlock" |
| Journal Tab - Team | No | Tap | No | Tried tapping card for more details. Not responsive. |
| Journal Tab - Scan Log | No | Tap | No | |
| Journal Tab - Scan Log | No | Tap + Pull | No | Repeated several times to scroll through entire list (mostly unknown/locked objects) |
| Journal Tab - Fio - Bio | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | Will scroll some, but nothing else loads |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Bio | No | Tap | No | Locked "Complete missions for previous animals to unlock one !" |
| Journal Tab - Chilli - Bio | No | Tap | No | Locked "Complete missions for previous animals to unlock one !" |
| Journal Tab - Aida - Bio | No | Tap | No | Locked "Complete missions for previous animals to unlock one !" |
| Journal Tab - Credits | No | Tap | No | Photos with labels that the AR animals are based off of. The people who built it (the app). Other supporters, delineated into groups. |
| Journal Tab - Credits | No | Tap + Pull | No | Scrolled through all credits |
| Wildiverse Tab | No | Tap | No | |
| Journal Tab - Team | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Journal Tab - Scan Log | No | Tap | No | |
| Journal Tab - Fio - Notes | No | Tap | No | |
| Journal Tab - Scan Log | No | Tap | No | |
| Journal Tab - Team | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| OK Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Terontang |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kenari |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Thank you Eka" |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "I wish I could spend my entire day following wild animals" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Unknown object | Yes | N/A | Yes - but problems decreased it | World froze and repopulated slightly different. Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Pisang Pisang Bisar |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| My dog | Yes | N/A | Yes | Seeing my dog next in the holographic forest made it feel more real |
| Camera Button | Yes | Tap | Yes - but problems decreased it | My dog (Solo) in Wildiverse |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown | Yes | Tap | Yes - but | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | problems decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Pisang Pisang Bisar |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Pisang Pisang Bisar |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Hello Johannes" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | "They're OK if the animals are happy and zoos help protect them" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Wildiverse Button | | | | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| My dog | Yes | N/A | Yes | Seeing my dog next in the holographic forest made it feel more real |
| Camera Button | Yes | Tap | Yes - but problems decreased it | My dog (Solo) in Wildiverse |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object. |
| Camera Froze | Yes | N/A | No | |
| Back Button | Yes | N/A | No | Camera freezes, so I back out |
| Enter Wildiverse Button | No | Tap | No | |
| Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | AR doesn't calibrate. Camera won't load. |
| Back Button | Yes | N/A | No | Camera freezes, so I back out |
| Enter Wildiverse Button | No | Tap | No | |
| Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | AR doesn't calibrate. Camera won't load. Restart app. |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse | Move to Next | |

| | | Button | Stage |
|---|---|---|---|
| Tap | No | Ready Button | Move to Next Stage |
| N/A | Yes | "Connecting to Location" | Loading Message |

| Tap | Yes | OK Button - Things to Scan | | |
|---|---|---|---|---|
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Won't load. Freezes. Walk around to reload world. Still can't get close enough to object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | I'm selecting the same Orangutan Poo that I scanned before, so it's not working. I don't understand and tap it many times. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| LiDAR | Yes | Tap | Yes - but problems decreased it | Shows light going outward, but nothing reloads or changes. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Won't load. Walk around to reload world. Still can't get close enough to object. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but | Kayu Bulan |

| | | | problems decreased it | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Won't load. Freezes. Walk around to reload world. Still can't get close enough to object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | I'm selecting the same objects that I scanned before, so it's not working. I don't understand and tap it many times. |
| Unknown object | Yes | N//A | Yes - but problems decreased it | Looking Upward. Walk around to reload world. Still can't get close enough to object. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object. After four minutes the world freezes and reloads enough times to allow me to do this. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kayu Bulan |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan. Toe seems to reach out and almost touch me. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan. Interesting swinging action. |
| Camera Button | Yes | Tap | Yes - but problems | Orangutan. Interesting hanging action. Repeated 8 times. |

| | | | decreased it | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Won't load. Walk around to reload world. Still can't get close enough to object. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kayu Bulan |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Disappeared. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I'll take that as a compliment" |
| Dialogue Button | No | Tap | No | "How? Useful to a zoo?" |
| Dialogue Button | No | Tap | No | "They're evil prisons for animals and must be eradicated." |
| Tap | No | Accept Mission | Move to Next Stage | |

| | | | | |
|---|---|---|---|---|
| Tap | No | Select Wildeverse Tab | | |
| Tap | No | Accept Mission | Move to Next Stage | |
| Tap | No | Enter Wildiverse | Move to Next Stage | |
| Tap | No | I'm Ready Button | Move to Next Stage | |
| Move Arm | Yes | Enter Wildiverse Button | Move to Next Stage | |
| Tap | No | Ready Button | Move to Next Stage | |
| N/A | Yes | "Connecting to Location" | Loading Message | |
| Tap | Yes | OK Button - Things to Scan | | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Malam malam |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Object seems to be resting on my Table. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Webbing bridge |

| | | | | |
|---|---|---|---|---|
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I need more information here" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Object disappears mid scan |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | I move out of scan range. |
| Unknown object | Yes | N/A | Yes - but problems | Walk toward closest object |

| | | | decreased it | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan nest |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Hornbill nest |
| Dialogue Button | No | Tap | No | "OK can someone explain please" |
| Dialogue Button | No | Tap | No | "Totally, mm hm" |
| Dialogue Button | No | Tap | No | "I'm glad that all that ice cream money is going to good causes" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Camera Button | Yes | Tap | Yes - but problems decreased it | My dog (Solo) in Wildiverse. Barking as an object appears over him. Repeated once. |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jelutong |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jelutong |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walk toward closest object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Discovered what this button did. Moved toward closest object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Oh hello there, Eka" |
| Dialogue Button | No | Tap | No | "Sounds, tasty" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | "What's it like being peed on by an orangutan?" |
| Dialogue | No | Tap | No | "I want to go back in" |

| | | | | |
|---|---|---|---|---|
| Button | | | | |
| Dialogue Button | No | Tap | No | "With a hat" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan urine |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Leaf Handkerchief |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |

| | | | | |
|---|---|---|---|---|
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Explain why Fio has a handkerchief" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | "Um. I'm not massive on ape [poop emoji]. Convince me" |
| Dialogue Button | No | Tap | No | "ALL RIGHT THEN I'M GOING IN TO GET YOUR [poop emoji]" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |

| World | Yes | Swing arm/wrist | No | Calibrate AR |
|---|---|---|---|---|
| Ready Button | No Yes Yes Tap Tap | | No No | |
| OK Button - Things to Scan Walk Button | | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunak Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunak Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunak Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Urine |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Urine |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "It's awesome" |
| Dialogue Button | No | Tap | No | "Fio is a great name for a boy" |
| Accept Button | No No No | Tap Tap Tap Tap | No No No No No | Accept mission |
| Wildiverse Tab | No Yes No | Swing arm/wrist | No No | |
| Enter Wildiverse | Yes | Tap | Yes - but problems decreased it | |
| Button I'm Ready Button | Yes | Tap Tap + Hold | | Calibrate AR |
| World Ready Button | | | | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| OK Button - Things to Scan Walk Button | | | | |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Bottles |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Litter - Plastic Food Container |

| | | | decreased it | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Unknown object  Back Button  Enter Wildiverse Button  I'm Ready Button  World Ready Button  OK Button - Things to Scan | Yes  Yes  No No  Yes  No | N/A  N/A  Tap  Tap Swing arm/wrist  Tap  Tap | Yes - but problems decreased it  Yes - but problems decreased it  No  No  No  No | Game is frozen  Try to move toward closest object via the button. This still required turning my body around, upward, and downward.  Calibrate AR |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Very difficult because of freezing, but I moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan, but moves out of area before I finish scanning. Bad tracking doesn't let me follow it |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Bottles |

| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. App Froze. |
|---|---|---|---|---|
| Back Button | Yes No No | N/A Tap Tap Tap | Yes - but problems decreased it No | Doesn't respond. App froze. |
| Wildiverse Tab | No Yes No | Swing arm/wrist | No | |
| Enter | Yes | Tap | No No No No No | |
| Wildiverse | Yes | Tap | Move around in | |
| Button  I'm | | Find nearest | Wildiverse via Walk | Calibrate AR |
| Ready Button | | target | | |
| World | | | | |
| Ready Button | | | | Button |
| OK Button - | | | | |
| Things to Scan | | | | |
| N/A | | | | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Bottles |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Boot |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Walked toward closest object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Walked toward closest object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan swinging in my hallway (lines up very well) |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan swinging in my hallway (lines up very well) |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Walked toward closest object. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Hi Amyra" |
| Dialogue | No | Tap | No | "Canals? In a forest? Er… why?" |

| Element | | | | |
|---|---|---|---|---|
| Button | | | | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kayu Cahang |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kayu Cahang |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "What is up Amyra" |
| Dialogue Button | No | Tap | No | "Thanks" |
| Dialogue Button | No | Tap | No | "Actually, why do we need water level readings?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Alulup |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Nyatoh Gagas |
| Walk Button | Yes | Tap + Hold | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "thanks Eka" |
| Dialogue Button | No | Tap | No | "It's hard but I'd rather know than not" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Pisang Pisang Bisar |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kemuning |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Foliage on ground by dog (Ahsoka) |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Hiiiii" |
| Dialogue Button | No | Tap | No | "Is this really helping?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - | No | Tap | No | |

You

| Item | | Action | | Notes |
|---|---|---|---|---|
| Journal Tab - Fio - Bio | No | Tap + Pull | No | |
| Journal Tab - Fio - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Fio - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Hampuak Galaget |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Hampuak Galaget |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Branch |
| Camera Button | Yes | T | Yes - but problems decreased it | Orangutan swinging by bookshelf |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fio |
| Back Button | Yes | Tap | Yes - but problems decreased it | Wanted to take more pics |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Orangutan swinging by bookshelf |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Is that a good or bad wow?" |
| Dialogue Button Buka | No | Tap | No | Hold your ponies"?" |
| Collect Button | No | Tap | No | Journal item |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

Things to Scan

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Did not happen with the orangutan. Not sure f because it was up high or because it was less dangerous. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Gorilla on bench |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "I learned from the best" |
| Dialogue Button | No | Tap | No | "I was thinking of Fio" |
| Dialogue Button | No | Tap | No | "So gorillas make their nests on the ground, then?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Finish Now | Yes | Tap | No | Summary of objects scanned |

| Button | | | | |
|---|---|---|---|---|
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "The good news" |
| Dialogue Button | No | Tap | No | "I heart the rain forest. Wildeverse version at least" |
| Dialogue Button | No | Tap | No | "I'd better be on my best behavior, then." |
| Dialogue Button | No | Tap | No | "Seriously?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Gorilla on near my dog Solo |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Gorilla on near my Table |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Sat in front of my Table |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

downward.

| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Great!" |
| Dialogue Button | No | Tap | No | "How similar are guerrillas to orangutans?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |

| | | | | |
|---|---|---|---|---|
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Sat by couch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka in warning |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward Buka for picture. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka by TV. Repeated 2x |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Phew" |
| Dialogue Button | No | Tap | No | "Three months! That must be hard" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Plant coming from carpet |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

| | | | | downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| object | | | decreased it | |
| --- | --- | --- | --- | --- |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Tasty" |
| Dialogue Button | No | Tap | No | "That sounds like non-woody plants with broad leaves that grow between trees" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Branches |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | decreased it | still required turning my body around, upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |

| | | | | |
|---|---|---|---|---|
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka in open space behind AR tree |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka in warning screen |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka by couch. Repeated x3 |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Branches |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Plant coming from carpet |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mbili |
| Continue | Yes | Tap | No | Summary of objects scanned |

| | | | | |
|---|---|---|---|---|
| Button | | | | |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Espoir. I haven't been able to find any termites" |
| Dialogue Button | No | Tap | No | "Just broken branches and chewed plants" |
| Dialogue Button | No | Tap | No | "What do you mean 'difficult things'?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Poop by me seat |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I need to de-dung my life. This is not what I signed up for." |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "Hey Espoir, I think I just saw some silverback hair and some termites" |
| Dialogue Button | No | Tap | No | "Espoir, did you just compare Jodi to a gorilla?" |
| Dialogue Button | No | Tap | No | "Oui. As we say in the Congo" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Unknown object | Yes | N/A | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue | Yes | Tap | No | Summary of points earned |

Button

| | | | | |
|---|---|---|---|---|
| Tap | Yes | Continue Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildiverse | |
| Dialogue Button | No | Tap | No | "Espoir?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bambu |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bambu |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Bambu |

| | | | | decreased it |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Branches |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Jodi I've been thinking. You work with gorillas in the zoo right?" |
| Dialogue Button | No | Tap | No | "But isn't a gorilla's life best in the wild?" |

| Collect Button | No | Tap | No | Journal item |
|---|---|---|---|---|

| Journal Tab - You | No | Tap | No | |
|---|---|---|---|---|
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | | still required turning my body around, upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Baso |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Baso |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Baso |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Finally" |
| Dialogue Button | No | Tap | No | "Are you going to make them a seed pod salad?" |
| Dialogue Button | No | Tap | No | "Espoir?" |
| Dialogue Button | No | Tap | No | "Espoir? 'ELPHNT' sounds worrying" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Branches |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Branches |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Botunga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| Scan Button | Yes | Tap | Yes - but problems decreased it | Botunga |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |

| | | | | |
|---|---|---|---|---|
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Phew" |
| Dialogue Button | No | Tap | No | "I was anxious. I found broken branches and elephant dung" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Object (Poncho) looks like it's really on my floor |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Poncho |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "A clue!" |
| Dialogue Button | No | Tap | No | "What does it take to be a silverback?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | Excuse me? |
| Dialogue Button | No | Tap | No | "Wait. An ape just sent us a group message from the forest?" |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "Eka. Espoir. Can't we get along?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

Sindelar 609

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Phone crashes | | | | |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bongi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo stem |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tondolo Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Tablet |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "And an enormous amount of nibbled leaves" |
| Dialogue Button | No | Tap | No | "I totally love the idea of studying gorillas in the wild" |
| Dialogue | No | Tap | No | "But it sounds… a bit much out in Goualougo" ; "But it sounds like I'd never |

| | | | | |
|---|---|---|---|---|
| Button | | | | want to leave Goualougo ; "But I have no idea what you have to do to get to Goualougo" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Camera Button | Yes | Tap | Yes - but problems decreased it | fruit scattered on ground |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Phone crashes | | | | |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

Things to Scan

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Zanha |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Zanha |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka sitting |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka nearby |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngata |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngata |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Head Net |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "?" |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "No recycling in the swamp. But what is this "mesh'?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Incomplete |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. |
| Moved back | Yes | Tap + Hold | Yes - but problems decreased it | Scooted away from object |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bird feathers |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka's face through warning screen |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Nguluma |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Camera Crashes | | | | |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |

| | | | | |
|---|---|---|---|---|
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bird feathers |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. |
| Moved back | Yes | Tap + Hold | Yes - but problems decreased it | Scooted away from object |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka in hallway |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |

| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| --- | --- | --- | --- | --- |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Nguluma |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka sitting in nest through warning screen |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Thanks" |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "Deforestation and loss of habitats?" |
| Dialogue Button | No | Tap | No | "What kind of trouble?" |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Flip Flop |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Campfire |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Flip Flop |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Trash on my floor |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |

| | | | | |
|---|---|---|---|---|
| Camera Button | Yes | Tap | Yes - but problems decreased it | Flip flop by my feet |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Flip Flop |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "This stuff isn't yours, is it Espoir?" |
| Dialogue Button | No | Tap | No | "Dare I ask what bushmeat is?" |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "Wow. Oh. My. Apes. That's… gorillas?" |
| Accept Button | No | Tap | No | Accept mission |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Twig |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka in hallway. Repeated 1x |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Surgical Mask |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Mask on floor. Pandemic significance |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

downward.

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Twig |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Broken Twig |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

Sindelar 625

| | | | | |
|---|---|---|---|---|
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Buka - Bio | No | Tap + Pull | No | |
| Journal Tab - Buka - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Buka - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bullets |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bullets |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "There are men with guns in this national park?" |
| Dialogue Button | No | Tap | No | Punish them, but don't ruin their lives |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Button | | | | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Preventing me from scanning objects. Waited for Buka to leave. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Buka |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Buka on floor |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This still required turning my body around, |

| | | | decreased it | upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Nest in tree in ceiling |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |

| | | | | |
|---|---|---|---|---|
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "You are very welcome" |
| Dialogue Button | No | Tap | No | "Sup?" |
| Dialogue Button | No | Tap | No | "For what?" |
| Dialogue Button | No | Tap | No | "A gibbon?" |
| Collect Button Chilli | No | Tap | No | Journal item |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "You're welcome. Gibbons really move fast" |
| Dialogue Button | No | Tap | No | Yes I did. I heard Chilli singing! |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jongkang Kuning |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jongkang Kuning |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jongkang Kuning |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Bunyer |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

Sindelar 634

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chili |
| Camera Button | Yes | Tap | Yes - but problems decreased it | First time seeing Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Bunyer |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Harder than orangutans and gorillas" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

Things to Scan

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Chilli in office |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Butterfly trap |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Hey Amyra… I scanned that butterfly trap!" |
| Dialogue Button | No | Tap | No | "Oh no. I feel like a murderer" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kenari |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kenari |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kenari |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kenari |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Thanks- I've scanned quite a lot of gibbon [poop emoji] |
| Dialogue Button | No | Tap | No | "No way" |
| Dialogue Button | No | Tap | No | "Eka. I've never met anyone who sleeps in a tree to avoid predators" |
| Collect Button | No | Tap | No | Journal item |
| Accept Button | No | Tap | No | Accept mission |
| Chat Log | No | Tap + Pull | No | Scrolling up to banner ad. Other have appeared, but |

I didn't pay them any attention.

| | | | | |
|---|---|---|---|---|
| Link External Site | No | Tap | No | Banner ad for Congo org. "Meet the animals that inspired wildeverse" |
| External Site | No | Tap + Pull | No | Scrolling through animals on website. |
| Phone menu button | No | Tap + Pull | No | Pull up open apps |
| Wildeverse App | No | Tap | No | Selecting from phone menu |
| Wildeverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiou |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Katiou |

decreased it

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Rabutan Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Webbing Bridge |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Rabutan Hutan |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "So is the food good at basecamp?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Terontang |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bajakah Luaa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bajakah Luaa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Terontang |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Water Level Meter |

| | | | decreased it | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jangkang Kuning |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Chilli in office |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jangkang Kuning |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jangkang Kuning |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Jangkang Kuning |

| | | | decreased it | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I live to serve. Gibbons and other apes" |
| Dialogue Button | No | Tap | No | "Yes. I am a big fan go G-Pop. Questions: why do gibbons sing?" |
| Dialogue Button | No | Tap | No | "4:30 AM is kind of early, Eka, but OK" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiau |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiau |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter very close to me |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "How do gibbons learn to sing, then?" |
| Dialogue Button | No | Tap | No | "Er… their names all start with 'c'" |
| Collect Button | No | Tap | No | Journal item |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

Things to Scan

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | fruit at base on tree |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Butterfly trap |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Bunyer |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Papong |

| | | | decreased it | |
|---|---|---|---|---|
| Camera Button | Yes | Tap | Yes - but problems decreased it | fruit at base on tree |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Leaf Handkerchief |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Bunyer |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | Does he mind me just following him around everywhere?" |

| | | | | |
|---|---|---|---|---|
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No  No | Tap + Pull  Tap | No  No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Dialogue Button | | | | "I can be patient" |
| Dialogue Button | No | Tap | No | "What shall I keep an eye out for?" |
| Dialogue Button | No | Tap | No | "I LOVE GIBBON [poop emoji]" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lunuk Punai |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Karinat |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Is that what you were looking for Eka" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | "I wish I could do more" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

| | | | | downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Camera Button | Yes | Tap | Yes - but problems decreased it | fruit at base on tree |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

downward.

| | | | | |
|---|---|---|---|---|
| | | | | downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jambu Burung |
| Camera Froze | Yes | Tap | Yes - but problems decreased it | Tapping many times to see if the app will come back |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Manggis Hutan |

|  |  |  | decreased it |  |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | |
| Phone died | | | | |
| Camera Froze | Yes | Tap | Yes - but problems decreased it | Tapping many times to see if the app will come back |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | |
| Phone Died | | | | |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Solo looks curious |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Air Quality Meter |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter | No | Tap | No | |

| Wildiverse Button | | | | |
|---|---|---|---|---|
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite branch |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite branch |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "hey hey hey" |
| Dialogue Button | No | Tap | No | "You OK? |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Air Quality Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ponak |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Air Quality Meter |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "pleasure" |
| Dialogue Button | No | Tap | No | "It's great. Fresh air every day!" |
| Accept Button | No  No | Tap  Tap | No  No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Chat Tab | | | | Went back to air quality link |
| Link External Site | No | Tap | No | Text link to interactive map with data. "Word's Air Pollution: Real-time Air Quality Index"" |
| External Site | No | Reverse Pinch | No | Zoom to Greenville. Worse air quality than I expected (Second highest, Moderate) |
| External Site | No | Tap | No | Tap air quality number to pull up details. Repeated several times. |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Doesn't calibrate. |
| Back Button | Yes | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Water Level Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Webbing Bridge |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lilin Lilin |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Webbing Bridge |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Lilin Lilin |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Webbing Bridge |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Finish Now | Yes | Tap | No | Summary of objects scanned |

| | | | | |
|---|---|---|---|---|
| Button | | | | |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Fingers crossed" |
| Dialogue Button | No | Tap | No | "LET'S SPEND IT ON A REALLY BIG PARTY" |
| Dialogue Button | No | Tap | No | "Oh" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic bottles |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Boot |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "What does it belong to?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| OK Button - | Yes | Tap | No | |
| Things to Scan Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiau |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiau |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Katiau |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Rambutan Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | decreased it | still required turning my body around, upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Rambutan Hutan |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "Cool. But I'm confused. Is palm oil evil or not?" |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | "Cool. But I'm confused. Is palm oil evil or not?" |
| Dialogue Button | No | Tap | No | "I'm with you Amyra. I avoid anything that says palm oil" on it" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Link External Site | No | Tap | No | Text link to Chester Zoo's webpage on sustainable palm oil |
| External Site | No | Tap + Pull | No | Scroll to read steps |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Peat Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kairnat |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kairnat |
| Phone Died | | | | |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Peat Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

downward.

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Karinat |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Karinat |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Manggis Hutan |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jetutong |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jetutong |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Air Quality Meter |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "What?" |
| Dialogue Button | No | Tap | No | "Seriously?" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | Shows journal notes that I've collected |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | Scroll to read new notes |
| Chat Tab | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Air Quality Meter |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gibbon Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chilli |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Orangutan Poo |

| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Papong |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Butterfly Trap |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I am ready for more. Bring me more animals" |
| Dialogue Button | No | Tap | No | "I think so… but I'm not sure I have what it takes…" |
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Chilli - Bio | No | Tap + Pull | No | |
| Journal Tab - Chilli - Notes | No | Tap | No | |
| Journal Tab - Chilli - Notes | No | Tap + Pull | No | |
| Chat Tab | No | Tap | No | |
| Accept Button Aida | No | Tap | No | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |

| Element | Col2 | Gesture | Col4 | Description |
|---|---|---|---|---|
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Litter - Plastic Food Container |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida in my hallway |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Chat Log | No | Tap + Pull | No | No new text was loading. Scrolling to bring about change. |
| Journal Tab - You | No | Tap | No | |
| Chat Log | No | Tap + Pull | No | No new text was loading. Scrolling to bring about change. Finally loads. |
| Dialogue Button | No | Tap | No | "I think I made a friend today" |
| Dialogue Button | No | Tap | No | "I'm getting that ape reality TV vibe again." |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |

| | | | | |
|---|---|---|---|---|
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida in my room |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |

| | | | | |
|---|---|---|---|---|
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| Dialogue Button | No | Tap | No | "Yes! Lots of gorilla food, right?" |
|---|---|---|---|---|
| Collect Button | No | Tap | No | Journal item |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Aida - Bio | No | Tap + Pull | No | |
| Journal Tab - Aida - Notes | No | Tap | No | |
| Journal Tab - Aida - Notes | No | Tap + Pull | No | |
| Chat Tab | No | Tap | No | |
| Dialogue Button | No | Tap | No | No way! You learn something new every day |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida moved before I finished scanning. |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida in hallway |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida in my room |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Chimp Nest |

| | | | decreased it | |
|---|---|---|---|---|
| Camera Button | Yes | Tap | Yes - but problems decreased it | Nest up my ceiling |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Nest up my ceiling |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| | | | | |
|---|---|---|---|---|
| Dialogue Button | No | Tap | No | "Chimps plural?" |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "So chimpanzees live in trees then?" |
| Accept Button | No | Tap | No | Accept mission |

| | | | | |
|---|---|---|---|---|
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Antiaris |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mboto |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida on my bench |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida by cabinet |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Botunga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Botunga |
| Warning Screen | Yes | N/A | Yes - but problems | Disabled other interactivity. |

| | | | decreased it | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Antiaris |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Antiaris |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "It doesn't seem that they have too far to go to find snacks, at least" |
| Dialogue Button | No | Tap | No | "How many chimpanzees are there?" |
| Dialogue Button | No | Tap | No | "Hmmm, is that good or bad? I'm filled with confusion" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida by door |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | decreased it | still required turning my body around, upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngata |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngata |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Ngombe Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| object | | | decreased it | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Baso |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Baso |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "If you want nest data, I'm the alpha nest-spotter" |
| Dialogue Button | No | Tap | No | "The alpha community of the Moto community is called 'Mark'?" |
| Dialogue Button | No | Tap | No | "You should have called him…" |
| Accept Button | No | Tap | No | Accept mission |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Aida - Bio | No | Tap + Pull | No | |
| Journal Tab - Aida - Notes | No | Tap | No | |
| Journal Tab - | No  No | Tap + Pull  Tap | No  No | |

| | | | | |
|---|---|---|---|---|
| Aida - Notes Chat Tab Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| object | | | decreased it | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Backed up |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Aida sitting on . Repeated 1x |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

| | | | | downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bokoko |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Is that your 'rare paring'?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Bangi Leaves |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bullets |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems | Moved toward closest object via the button. This |

| | | | decreased it | still required turning my body around, upward, and downward. |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Club Stick |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | OK, what does this mean? Chewed stick, stick that looks like a club?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |

| | | | | |
|---|---|---|---|---|
| Camera Button | Yes | Tap | Yes - but problems decreased it | Plants growing in my living room |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Boboko Stem |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Camera Button | Yes | Tap | Yes - but problems decreased it | Cell phone on floor |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Satellite Phone |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
|---|---|---|---|---|
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |

| Dialogue Button | No | Tap | No | "Espoir, you can stop doing the washing up!" |
|---|---|---|---|---|
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| Camera Button | Yes | Tap | Yes -more real than other things | Termite mound on floor |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Mound |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Didn't finish scan |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Fusa |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Backed up |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Camera Button | Yes | Tap | Yes -more real than other things | Aida near my seat |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Club Stick |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Club Stick |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "I'm going to start a blog on chimp tech" |
| Collect Button | No | Tap | No | Accept mission |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Aida - Bio | No | Tap + Pull | No | |
| Journal Tab - Aida - Notes | No | Tap | No | |
| Journal Tab - | No | Tap + Pull | No | |
| Aida - Notes | No | Tap | No | |
| Chat Tab | | | | |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter | No | Tap | No | |

| | | | | |
|---|---|---|---|---|
| Wildiverse Button | | | | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Elephant Dung |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Campfire |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Not the Wildiverse kind!" |
| Dialogue Button | No | Tap | No | "Chimps sit around telling stories about fruit. I knew it" |

| Accept Button | No | Tap | No | Accept mission |
|---|---|---|---|---|
| Wildiverse Tab | No | Tap | No | |

| Element | | Gesture | | Notes |
|---|---|---|---|---|
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Scan doesn't finish |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Waited for Aida to move on |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Camera Button | Yes | Tap | Yes -more real than other things | Chimp Nest in living room |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Weather Station |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Mound |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Great" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Camera Button | Yes | Tap | Yes -more real than other things | Chimp Nest in living room |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |

| | | | | |
|---|---|---|---|---|
| Camera Froze | Yes | Tap | Yes - but problems decreased it | Restart app |
| Back Button | Yes | N/A | No | Camera freezes, so I back out |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

| | | | | |
|---|---|---|---|---|
| | | | downward. | |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Yonga |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Camera Button | Yes | Tap | Yes -more real than other things | Mwase by my foot |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mwase |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Plenty o'nests" |
| Dialogue Button | No | Tap | No | "Chimp reality TV time, I'm guessing" |
| Collect Button | No | Tap | No | Journal item |
| Dialogue Button | No | Tap | No | "That's my chimp" |

| | | | | |
|---|---|---|---|---|
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Aida - Bio | No | Tap + Pull | No | |
| Journal Tab - Aida - Notes | No | Tap | No | |
| Journal Tab - Aida - Notes | No | Tap + Pull | No | |
| Wildiverse Tab | No | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Solla |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Solla |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mobel |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Mobel |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Camera Button | Yes | Tap | Yes -more real than other things | Aida on my floor repeated x1 |
| Unknown object | Yes | N/A | Yes | Walk toward closest object |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Backed up |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option. Aida moves before scan finishes |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Thanks!" |
| Collect Button | No | Tap | No | Journal item |
| Accept Button | No | Tap | No | |
| Wildiverse Tab Chat Tab | No  No | Tap  Tap | No  No | |
| Journal Tab - You | No | Tap | No | |
| Journal Tab - Aida - Bio | No | Tap + Pull | No | |
| Journal Tab - Aida - Notes | No | Tap | No | |
| Journal Tab - Aida - Notes | No  No | Tap + Pull  Tap | No  No | |
| Chat Tab Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Fishing Probe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Club Stick |
| Camera Button | Yes | Tap | Yes -more real than other things | Chimp poo in front of my dog |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |

| | | | | |
|---|---|---|---|---|
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Club Stick |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "No…" |
| Dialogue Button | No | Tap | No | "You basically live in a nature documentary, Espoir" |
| Dialogue Button | No | Tap | No | "At the moment I actually do?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - | Yes | Tap | No | |

Things to Scan

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bangi Leaves |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Sardine Can Fence |
| Camera Button | Yes | Rotate Wrist + Tap | Yes -more real than other things | Fence in my living room. Felt like it fit. |
| Sardine Can Fence | Yes | N/A | Yes | Walked backward for better angle |
| Camera Button | Yes | Rotate Wrist + Tap | Yes -more real than other things | Fence in my living room. Felt like it fit. |
| Camera Button | Yes | Rotate Wrist + Tap | Yes -more real than other things | Fence in my living room. Felt like it fit. Repeated 1x |

| | | | | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Sardine Can Fence |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Sardine cans?" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Aida |

| | | | | |
|---|---|---|---|---|
| | | | | decreased it |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Aida | Yes | Tap | Yes - but problems decreased it | Tapped many times. Not sure why. Confused? |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Nest |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Kakala |

| | | | | |
|---|---|---|---|---|
| | | | decreased it | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kakala |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Kakala |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Gorilla Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Weather Station |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Chimp Poo |

| | | | decreased it | |
|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Continue Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Tap | Yes | Continue Button | Shows summary of scanned objects | |
| Tap | Yes | Continue Button | Shows summary of points earned and leaves Wildeverse | |
| Dialogue Button | No | Tap | No | "kailan the Tracker: Animal Detective" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and |

| | | | | |
|---|---|---|---|---|
| | | | downward. | |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Bullets |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Warning Screen | Yes | N/A | Yes - but problems decreased it | Disabled other interactivity. Wait for Aida to pass |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo B |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Termite Mound |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Aida | Yes | Tap | Yes - but problems decreased it | Tapped many times. Not sure why. Confused? |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems | Jolo A |

| | | | | decreased it | |
|---|---|---|---|---|---|
| Walk Button | Yes | Tap + Hold | | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | | Yes - but problems decreased it | Jolo A |
| Walk Button | Yes | Tap + Hold | | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | | Yes - but problems decreased it | Open Scan option |

| | | | | |
|---|---|---|---|---|
| Scan Button | Yes | Tap | Yes - but problems decreased it | Jolo A |
| Finish Now Button | Yes | Tap | No | Summary of objects scanned |
| Continue Button | Yes | Tap | No | Summary of points earned |
| Dialogue Button | No | Tap | No | "Indeed!" |
| Accept Button | No | Tap | No | Accept mission |
| Wildiverse Tab | No | Tap | No | |
| Enter Wildiverse Button | No | Tap | No | |
| I'm Ready Button | No | Tap | No | |
| World | Yes | Swing arm/wrist | No | Calibrate AR |
| Ready Button | No | Tap | No | |
| OK Button - Things to Scan | Yes | Tap | No | |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Dugout Canoe |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown | Yes | Tap | Yes - but problems | Open Scan option |

| | | | | |
|---|---|---|---|---|
| object | | | decreased it | |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Chimp Poo |
| Walk Button | Yes | Tap + Hold | Yes - but problems decreased it | Moved toward closest object via the button. This still required turning my body around, upward, and downward. |
| Unknown object | Yes | Tap | Yes - but problems decreased it | Open Scan option |
| Scan Button | Yes | Tap | Yes - but problems decreased it | Aida |
| Continue Button | Yes | Tap | Yes - but problems decreased it | Observed Aida in AR for a little longer, but then there was no way to end the mission. Restarted the app. |
| Dialogue Button | No | Tap | No | "OK!" |
| Dialogue Button | No | Tap | No | "Everyone's here and saying 'thank you'" |
| Dialogue Button | No | Tap | No | "Um… why do I get the feeling this is the end?" |
| Dialogue Button | No | Tap | No | "I'd like to keep doing what I can to help! What should I do?" |
| Link External Site | No | Tap | No | Link to how the user can help. Hosted on WildiverseGame.com |
| WildiverseGame.com | No | Tap + Scroll | No | Scroll through page. Features explanation on how learning and attitude matter, and where to go from there |
| Get the Details | No | Tap | No | Open page on specifics |
| Internet of Elephants | No | Tap + Scroll | No | Scroll through page. Features numbered list and more links |