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# Developing E-Learning at the British Postal Museum & Archive

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# **Bringing Entertainment to Education: E-Learning at the BPMA**

Sponsored by the British Postal Museum and Archive  
**London Project Center**

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## **Abstract**

In this project, we designed an educational e-learning game for the British Postal Museum & Archive. Our game targets children ages 7-11 and builds on topics in the U.K.'s National Curriculum for this age group. The game highlights time periods to be featured in BPMA's upcoming new exhibit space, introducing visitors to facts, characters, and stories from postal history. Our design's flexible structure will allow the BPMA to modify the content as their exhibit design evolves.

## Executive Summary

Our project, titled “Bringing Entertainment to Education: E-Learning at the BPMA,” started the development process of an e-learning tool for the British Postal Museum & Archive (BPMA). Our overall project objective was to evaluate different e-learning programs and design a cost-efficient and interactive e-learning prototype for the BPMA. We worked with Andy Richmond, the BPMA’s Access and Learning Manager, Martin Devereux, the Deputy Catalogue Manager, and Alison Bean, the Web Officer.

The BPMA, a small museum with limited space, hopes to expand their audience base through an e-learning tool. Their current exhibition only has space to display a few artifacts, and the Museum Store is difficult to open to the public for daily visits. The BPMA is currently planning a New Centre, which would provide more exhibition space. Their goals for our project, combined with information gathered from archival research, interviews with e-learning experts, and evaluations of existing museum e-learning tools led to our decision to create a game. This game, if designed in tandem with the exhibits at the New Centre, could provide visitors with an immersive, interactive museum experience, and highlight the importance of postal history.

Our design was shaped by evaluations of online and in-museum e-learning tools offered at the London Science Museum, the Museum of London, London Transport Museum, and the Bank of England Museum. We ranked these tools in terms of their effectiveness in several key areas. These key areas were aspects such as ease of navigation, look & feel, educational content, and age appropriateness. This list of key e-learning components was based on information gathered through interviews with e-learning experts and discussions with our sponsor. These evaluations allowed us to determine what options were available to us, while highlighting the key components of each tool. Through these evaluations, we decided that a game would be the most effective for the BPMA.

The BPMA is trying to expand their audience base to families and school groups with children ages 7-11. Our design targeting the following key goals: visually appealing and easy to navigate; include educational content relevant to the U.K. National Curriculum; offer reward features; directly link to the future exhibit; adaptable to future changes in the exhibit; encourage users to visit the museum; diminish the stigma that postal history is a niche learning topic.

After going through the plans for the New Centre, we consulted our sponsors and conducted research into the five areas of postal history that are going to be presented in the future exhibit. We cross-referenced this data with the KS2 units of the National Curriculum and selected pieces of postal history that are most relevant to the KS2 material.

In our proposed game, “Mail Tales,” the user travels through time to learn about the five time periods in postal history that will be highlighted in the BPMA’s New Centre. To do this, the user creates an avatar in their image. This avatar is guided through the time periods by Tibs the Cat, a cat who was formerly employed by the Post Office to catch rats.

Each time period contains several mini-games. These mini-games fulfill our design goals by teaching interesting, relatable facts about postal history. Key figures from history introduce each mini-game, providing educational content and context for the games. After each mini-game, the user is presented with a stamp and, in some cases, an inventory item as rewards for completing the mini-game. These items are collected in a Stamp Book and an Inventory. Potential inventory items include old postal uniforms their avatar can wear and items the BPMA would like to highlight from their collections. Some stamps and inventory items can be acquired only during museum visits, motivating users to return to the BPMA.

We designed “Mail Tales” to be completed online after starting it during a museum visit. The strong connection between the game and the future New Centre exhibit was designed to attract more visitors to the museum and to encourage users to come back to the museum. Finally, the content in “Mail Tales” was designed to convey that postal history is engaging and relevant to a wide audience.

We developed a series of drawn storyboards to illustrate the mini-games and overall gameplay. The storyboards illustrate our visual effects targeted at 7-11 year olds. We were able to present our design storyboards to members of our target audience on two separate Open Days at the BPMA’s Museum Store. We asked questions that allowed us to determine if components of our game satisfied our design goals. We determined that: the inclusion of Tibs the Cat would spark the interest of our target audience; our game storyboards and content were age appropriate; and parents would encourage their children to play the game.

Based on the research we conducted during this project, we would like to make several recommendations to the BPMA with regards to the New Centre exhibition space. We recommend that the BPMA implement the game both in-museum and online to provide users

with the option of an engaging post-visit experience. The exhibit can include special edition rewards for users that would encourage users to revisit the museum. The in-museum version should be implemented on a touchscreen platform since trends in museum technology are moving toward the use of touchscreens. We want “Mail Tales” to still be modern and useful several years down the line. Since desktop computers are still very prevalent in homes, the online version should be playable on this platform. The flexible structure of “Mail Tales” allows for an incremented development process, which we recommend to avoid high initial implementation costs. We also recommend that the design team test the “Mail Tales” prototype ideas more before proceeding. Since we were only able to speak with ten parties who attended Open Days at the Museum Store, we believe more feedback about game content, presentation, and components could benefit “Mail Tales.”

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## Introduction

It is increasingly difficult for museums to compete with other forms of entertainment, such as the Internet, theme parks, and sporting events. People are more inclined to seek entertainment that provides instant gratification (Alexander 2008). In response, many large museums have begun to incorporate digital technology into their exhibits and programs to attract more visitors. These additions come in many forms, from digital exhibits to online learning packs. The integration of technology into the museum experience has begun to spark public interest. However, many questions remain about how technology can best be used to engage the public and create an enjoyable learning experience. For the purpose of this project, we will focus on developing one way the BPMA can incorporate technology into their museum experience.

The purpose of the BPMA is to educate the public on British postal history. The BPMA is unlike other London museums because it does not yet have a grand physical space in which to exhibit the 100,000+ items in its extensive collection. The BPMA currently has only a small museum store and cannot offer a traditional museum experience (A. Richmond, personal communication, February 10, 2012). This physical constraint leaves the BPMA to rely mostly on the Internet to reach out to and engage with the public. Our group has been asked to develop an e-learning program that will bring the BPMA's digital offerings up to par with similar programs offered by other London museums. This e-learning program will be one of many the BPMA hopes to implement in preparation for its move to a larger, purpose-built museum space in the near future.

The goal of this project is to evaluate e-learning options and recommend a cost-efficient and interactive prototype. The project has five main objectives: (1) characterize the state-of-the-art in e-learning in museums; (2) clarify the BPMA's purpose in developing e-learning options; (3) develop content and design prototype structure; (4) evaluate a prototype; and (5) recommend how the BPMA should proceed. To start our research on effective e-learning tools, our group reviewed several benchmark programs currently used at other heritage museums, as well as relevant literature. We also held discussions with the BPMA to determine what they seek to achieve with this e-learning tool. The BPMA indicated a strong interest in educational games, as they are trying to reach a young target audience. Following up on these discussions, our research showed that games are the one of the most interactive ways to capture the attention of the

younger demographic. Accordingly, our group decided to design a prototype of an e-learning game.

This game had to satisfy a certain set of requirements: (1) be accessible for schoolchildren and families with children between the ages of seven and eleven; (2) “create interest and stimulate curiosity,” with the goal of “challenging ... the perception that postal heritage is a niche subject” (A. Richmond, personal communication, February 10, 2012); (3) balance educational content and engaging material; and (4) have a flexible structure that can accommodate future changes in the BPMA’s exhibit.

There were several tasks involved in successfully completing this project. In addition to reviewing literature and current e-learning programs, we interviewed e-learning experts, in Worcester as well as in London. To clarify the purpose behind the BPMA’s venture into e-learning, we reviewed the BPMA’s current e-learning offerings and held discussions with their staff. To supplement our research, we evaluated e-learning offerings at other London museums. We researched topics from British postal history to develop engaging, educational content for the game. Having done this research, we designed a game prototype that effectively satisfies the majority of our goals. Storyboards of our prototype were continuously reviewed by our sponsors and presented to families for feedback. We incorporated this feedback into a final proposal with suggestions for use and implementation. Our deliverables to the BPMA consisted of a design brief, storyboards, educational criteria, and recommendations for implementation.



## Literature Review

### Goals of Museums

Over the course of history, the focus of museums has shifted from research and collection to exhibition and education. The purpose of these exhibitions was, at first, to display the objects for public view in an aesthetically pleasing manner (Alexander 2008). However, it soon became evident that educating the public was just as important as aesthetically pleasing exhibitions. Teachers started to view museums as supplements to their educational programs (Hein 1998; Alexander 2008). The educational approaches used in museums were rather mundane; according to George Hein, the exhibitions were “deliberately didactic” (1998). The curators in charge of education lectured their visitors with no regard for their learning experience. Museums continued to use this approach for decades; it was only recently that visitor experience became a priority for museums (Hudson 1998). The importance of visitor experience brought about the creation of museum programs. These programs were designed to educate the public in a more engaging way than the traditional lectures; some of them targeted school groups, while others were geared towards tourists.

### Static to Dynamic Exhibits

During the 20th century, educational theory became an important factor in planning museum exhibitions (Alexander 2008; Hein 1998). The earliest theory was the didactic theory, which describes the traditional teaching style used in schools. In museums, the didactic approach entails a rather mundane exhibit, with a descriptive plaque for each exhibit item. The information on these plaques was chosen by the curators, who typically picked dull facts that would interest only the most niche audiences. Around the mid-20th century, a more behaviorist theory began to circulate the academic world; it was dubbed stimulus-response education, which takes into account an individual’s response to a particular stimulus. Museums incorporated this theory into their exhibits by arranging simple tasks or quizzes for the visitors to complete after viewing a piece of information (Hein 1998).

A more progressive educational approach is the theory of discovery learning, also known as constructivism. In this approach, a student has an ‘epiphany moment,’ where he realizes something without being told explicitly what the conclusion is, simply by following his own

train of thought (Hein 1998). Typically, this approach involves more hands-on work with the presented material. Theoretically, the discovery learning approach is an ideal way for students to grasp material; in practice, it is very difficult to implement a discovery-based curriculum that guarantees success. Despite this challenge, some museums have incorporated discovery-based approaches into their exhibits, such as “exhibitions that allow exploration” and “school programs that engage students in activities intended to lead them to accepted conclusions” (Hein 1998). A typical modern museum will incorporate sections from all four of these approaches. In implementing such exhibits, it is important to understand why people visit museums.

### Role of Technology

Museums are incorporating technology into their structure to provide the visitors with a more informative museum experience (Pallud & Monod, 2010). In order to provide an enhanced museum experience, museums are seeking out technological means to give visitors an interactive visit, stimulating the senses and intellectual curiosities. To create this physical interaction for visitors, the museums use different means. These could vary from a visitor using a Smartphone to a game application. The goal of this physical interaction is to elicit a response from the visitor. An example of this is MuseumScouts, a project aimed to enhance student learning in museums. In studying MuseumScouts, Wishart and Triggs found that that the most enjoyable part of the experience for the students was the physical interactions with the different artifacts (2009). To stimulate intellectual curiosity, museums use audio devices and present a variety of images. The best way a museum can create a more “immersive and interactive [experience]” for visitors is to provide both physical and mental stimulation through technological means (Pallud & Monod, 2010, p. 563). This approach appeals to all types of museum visitors, providing museums with a stable clientele.

In addition to providing more interaction, museum technology satisfies visitors’ goals for attending museum exhibits. A visitor’s goals can range from forming emotional connections with the past to finding his or her identity (Pallud & Monod, 2010, p. 562). Museums introduce different forms of technology to aid visitors in reaching their goals. According to Pallud and Monod, incorporating technology is “a reasonable way for museums to re-energize their relationships with their visitors” (2010, p. 562). According to Morris Hargreaves McIntyre, a research consulting company that works with cultural associations, there are four major types of museum visitors: intellectual, spiritual, emotional, and social (2006). The intellectual visitor sees

the museum as a source of knowledge, where one could learn more about a topic of interest. The spiritual visitor goes to a museum to escape from the outside world, using it as a safe haven of sorts. The emotional visitor typically feels a “personal connection to the subject matter” and “seeks ambience” (McIntyre 2007). The social visitor views the museum as a place for himself and his family or friends to spend time together. These criteria are in tandem with research performed by John Falk and Lynn Dierking, who believe that “visitors to museums are strongly influenced by the interactions and collaborations they have with individuals within their own social group” (2007). Ideally, a museum’s exhibit will satisfy each type of visitor. To achieve this, the museum must utilize an educational approach that will meet visitors’ expectations.

In addition to helping visitors accomplish their personal tasks and teaching the museums’ material, museums use technology to compete with other forms of entertainment (Macedonia, 2003, p. 94). Due to this competition, museums need to utilize technology to its full potential in order to stay competitive. Macedonia indicated that a study performed in 2002 showed that “only 62 percent of museums have a website, [while] 75 percent of public libraries [have one],” showing that museums have much to accomplish to continue to attract visitors (94).

### Technology at the BPMA

Technology has become the BPMA’s primary way of educating the public about British postal heritage. The BPMA has been utilizing different forms of technology to educate their visitors, partially due to their limited physical space. The BPMA is looking to remedy this problem by moving to the BPMA New Centre, a larger facility. To facilitate this transition, the BPMA is trying to integrate technology into their structure. Different technological tools will provide the BPMA with a new outlet to showcase their collections, including the 90,000+ catalogued records (British Postal Museum & Archive, 2010). These tools will allow the BPMA to transform into a modern museum that will attract large numbers of visitors on a regular basis (A. Richmond, personal communication, February 10, 2012).

During the BPMA’s transition period, the BPMA intends to apply technology to fulfill a number of goals. These goals include: (1) showcasing the extent of the BPMA’s collection, (2) raising awareness about the role of the British postal service, and (3) broadening the audience base of the BPMA (A. Richmond, personal communication, February 10, 2012). Using different technological tools, the BPMA can create diverse programs and exhibits that will satisfy the

needs of families and school groups. In addition, the BPMA wants to provide an experience that presents peculiar, interesting information to break the perception that the postal heritage is a “niche subject” (A. Richmond, personal communication, February 10, 2012). The BPMA hopes that these ‘quirky bits’ of information will appeal to visitors and entice them to visit again. The BPMA is optimistic that through technology, they will be able to provide a fun and interactive experience that will foster learning among families and school groups.

## Learning

To better understand how people learn, we examined the subcategories of learning: formal and informal. In formal learning, an instructor relays information to the learner. The instructor determines the course of study and the manner in which it is taught. Informal learning, or natural learning, is different in that the students choose the direction of study (Selwyn n.d.). Informal learning can take place through any form of interaction in which people introduce each other to new information. One way to encourage informal learning is through e-learning venues. Selwyn discusses two well-known venues in which informal learning is accomplished: Facebook and Second Life. Each application promotes different areas of learning, but both teach through “natural methods” (Selwyn n.d.). According to Selwyn, Facebook promotes cultural learning, while Second Life is used for promoting group collaboration. Heritage organizations, such as museums, can benefit immensely from the use of these types of e-learning applications.

## E-Learning

Over the past 15 years, e-learning has become widely used for various applications. E-learning can be defined as any learning program that is transmitted over the Internet. Games, online reports, and videos of lectures all fall under the category of e-learning. For educational use, the most commonly used e-learning tools are games, blogs, podcasts, and websites. Since e-learning has been rapidly growing, with a 35% global increase in 2006, it has become a necessary component of educational establishments’ offerings (Sun, Tsai, Finger, Chen, & Yeh).

### *Types of E-Learning*

E-learning falls into two major categories: collaborative and individual. For both categories, feedback is essential to the users’ learning process. In collaborative learning, this feedback is provided by the other learners. However, feedback with individual learning becomes

more difficult. Not only must a program provide proper feedback, it must also adapt to the learner. Since individuals learn in different ways, one teaching style may not be effective for all users. Individuals who find an e-learning program ineffective may see this program “as a challenge, hard, or distasteful” (Hsieh & Cho, 2010, p. 3). To avoid this, feedback from the program must be clear to users. An e-learning program that includes the following four attributes becomes far more effective to the learner. The attributes are: “1) immediate feedback, 2) number of cues involved (i.e., body language, facial expression, and tone of voice), 3) message personalization, and 4) natural [language]” (Hsieh & Cho, 2010).

### *Benefits of Effective E-Learning*

One major benefit of e-learning is the lack of restriction on time and location. Individuals can access learning materials and coursework at any time of day from any location. This allows an organization, such as a museum, to broaden their audience from the museum visitors to anyone with an Internet connection. Another benefit of e-learning is that the user can learn at his own pace. The user is not required to reach a certain level of competence at any specified time. In this environment, participants can end the learning process whenever they choose. This is beneficial for students, but poses a problem for the organizations that implement e-learning tools. E-learning programs must have a method of maintaining the attention of different types of learners (Hsieh & Cho, 2010).

### *Games*

Games are a promising type of e-learning program for museums like the BPMA, whose target audience is young children and families. It is only natural that this means of education should migrate into the area of e-learning. “[Games] succeed by entertaining players, building on their curiosity and competitiveness” (Charles, Bustard, & Black, 2009, p. 1). Young children are notorious for their natural curiosity. Thus, our goal becomes turning this curiosity into an effective learning process.

In this area, there are those who work under the “Angry Bird” model of learning. In this style of learning, the student’s knowledge is tested through a series of stages of progressing difficulty. The students are required to show proficiency in the area of learning that the level is focused on. Once this is done, the student is rewarded by progressing to the next level of the game. This continues until the game is finally completed. In this model, “... students test out

their assumptions, factor in new knowledge, test and repeat ...” (Amy Stevens, personal communication, February 8, 2012). Some systems are able to do this without the students even realizing that they are being tested (Amy Stevens, personal communication, February 8, 2012).

This type of e-learning program is perfect for museums like the BPMA whose target audience is young children and families. This target audience is not looking for a formal education setting when looking at online learning systems. Instead, a fun and entertaining program is more likely to catch the attention of the students and maintain that attention for a longer period of time. This type of quality is hard to quantify and analyze, but there are aspects of the game that are able to be tracked. These aspects do not directly lead to the game being more enjoyable, but do help it to reach a larger audience. Our group therefore created a checklist of possible observations that can be used to analyze a game. This checklist can be found in Appendix B.

A popular game genre used for e-learning is online role playing games. These games provide a virtual world that players can explore. Although labeled as games, they do not have the typical characteristics of a game. Scores, difficulty levels, and the ability to win or lose are not necessary in this environment (Selwyn). Instead, interaction is the key to solving the problems presented in the game. These problems can be solved individually or in a collaborative fashion. This type of application is an effective e-learning tool for a museum. A world in which users can interact with museum artifacts provides a much more in-depth learning experience.

## Current E-Learning Tools in Use

### Benchmarks Programs

The state-of-the-art e-learning programs, including games, offered at other museums will help us understand how e-learning is used in a museum setting. Most of these programs are games from different museum websites; one website contains online courses. These tools have received positive feedback from the museums’ target audiences, and should therefore be used as guidelines in creating a prototype. These programs include: Launchball, from the London Museum of Science; WebQuests, created by the National Museum’s Online Learning Project in 2006; and online courses and games from the National Archives in London.

Launchball was developed by the Science Museum and WebQuest via the National Museum’s Online Learning Project in 2006 (Launchball). In Launchball, the participant’s

knowledge of general physics is put to the test. As the user plays the game, the levels become increasingly more difficult. The game incorporates puzzles which use a variety of phenomena, such as heat, electricity, and wind. While Launchball does a great job of testing the participant's knowledge of physics, it has one downfall. At the end of each level, a random fact is displayed. These facts are not always relevant to the concepts introduced in the level, and are frequently repeated. Therefore they tend to be ignored or skipped over. This is a factor that our team needs to consider as we design our prototype.

WebQuests addresses the problems facing the Launchball application by using collaborative learning and integrating the information into the game. In WebQuests, the participants are given a problem and asked to find a solution. Users are guided through the problem, prompted by research questions. They are given tasks that allow them to slowly build their answer without taking away from their creativity. To answer a prompted question, users must access a variety of museum websites and use the information obtained to formulate a solution to the problem. Interestingly enough, the problems do not always require a written response. In one activity, the participants are asked to design armor for dogs that were used in World War I. Many types of dogs with different functions had to be taken into account while the users were sketching their armor. This all-encompassing approach teaches a far greater amount of material in a much more effective manner than "Launchball." With all this material, a significant amount of time must be devoted to the project. The previously mentioned dog protection problem has an estimated solution time of three hours (WebQuests).

The National Archive is the only one of these museums to showcase a different approach. Their e-learning material contains programs that can be accessed by teachers for students. Many of these are in the form of virtual classrooms that create an activity for the students to do while using the material from the museum. For example, in the lesson on the sinking of the Titanic students use letters and other primary source documents to understand what it was like aboard the famous ship. At the end of this the students are able to question an expert on the material that they have just learned, and then write a note as if they were a passenger on the vessel (Passengers' Experience Aboard the Titanic). This program allows for the three major aspects of learning; harvesting information, questioning, and assessment in a fun, and engaging manner. This is the type of method that would serve the BPMA well if incorporated into their collection. The overall time is pretty low for a classroom activity, with a running time of about an hour

(Passengers' Experience Aboard the Titanic). While this approach can be highly educational, it falls under the category of formal learning and may not be as interactive as other types of e-learning (Selwyn n.d.).

## E-Learning at the BPMA

The BPMA greatly values its current e-learning options, but is also looking to expand. One of our sponsors, Allison Bean, the Website Officer of the BPMA explained, “our website reflects the fact that we don’t currently offer a traditional museum experience and therefore have to compensate by making our collections accessible online” (personal communication, February 10, 2012). The BPMA also tries to incorporate social media into their visitors’ experience. They hope to expand on this in the future, including adapting their website to a mobile-friendly version and incorporating social media into physical exhibits.

## Learning Packets

The BPMA’s website provides learning packs for teachers to bring to the classroom. These learning packs are posted on their website under Learning Packs & Resources for Schools. There are eight learning packs, covering topics such as “Messages Through Time,” which contains facsimiles of archives, and “Ironbridge,” which interactively teaches students about the postage system before uniform penny postage was introduced. Each learning pack consists of PDF files teachers can download and print out for classroom use. Some learning packs can also be ordered as hard copies from the BPMA. Though the learning packs are not as interactive as an online game would be, they do present a variety of information in an interesting, interactive way. For example, students can study British postal history while learning simple math in the “First Class” pack on stamps. These packs provide us with a good baseline for the information our project will teach (Learning Pack & Resources).

## The BPMA’s Website

The BPMA’s website is divided into several sections, each providing the user with different information about British postal history and the museum’s collections. These sections are targeted toward the independent adult learner. Each section follows the same template, displaying many topics in a grid format, all with a preview image. The section covering British postal history highlights 28 specific topics. The information is provided in a clear and concise

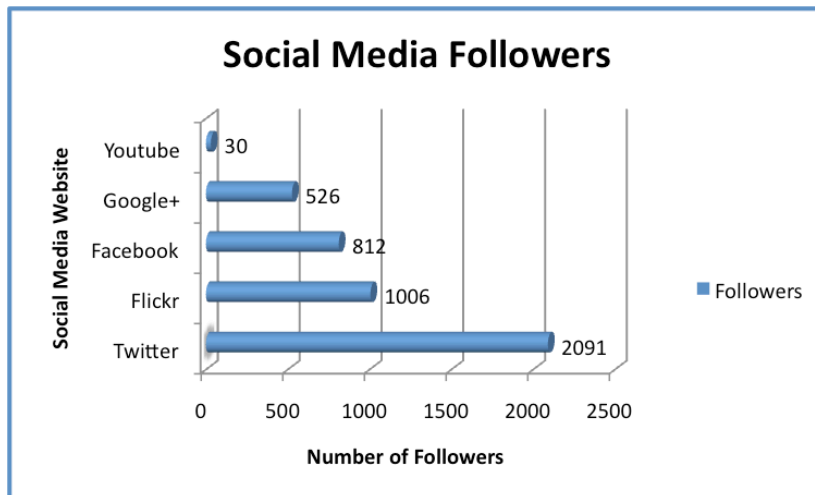


fashion, so that it is easy to understand. On each separate webpage, pictures of artifacts and archives are shown to support and explain the topics (British Postal History). The Collections and Catalogue section of the BPMA's website contains 36 collections. Each link leads to a webpage with a short description of the collection and several downloadable images of samples from the collection (Collections & Catalogue). The Online Exhibitions webpage contains a plethora of information. It features 26 different topics, each with subtopics. Pages like "Timeline - Horses to Horsepower" could be made more user-friendly and interactive (Online Exhibitions).

If the website template for the display of topics were consolidated, the information might be more accessible to the user. The current display may appear overwhelming. It could be improved if the grid were to take up less space on the webpage, as scrolling through 36 topics might deter some users. However, this portion of the BPMA's e-learning is targeted toward "researchers and people with special interests, such as articles looking at different aspects of postal history, digitized version[s] of items in our collection, and online versions of our exhibitions and displays" (Allison Bean, personal communication, February 10, 2012). This is applicable to our project because we need to keep our target audience in mind, so we do not overwhelm our user with too much information.

### Social Media Accounts

The BPMA maintains several social media accounts. Daily updates are posted on the BPMA's Google+, YouTube, Facebook, Flickr, and Twitter accounts (*Facebook - The British Postal Museum & Archive; Google+ - British Postal Museum & Archive; Twitter - BPMA; YouTube - Postal Heritage; Flickr - British Postal Museum & Archive*). The number of followers for each account is illustrated in the Social Media Followers graph below (Figure 1). Allison Bean also updates the BPMA's blog daily and posts podcasts of talks held at the BPMA, with a goal of attracting "a new audience" (*The British Postal Museum & Archive: The Leading Resource for British Postal Heritage; British Postal Museum & Archive Podcast*; personal communication, February 10, 2012).



**Figure 1 - Use of Social Account Graph**

## Conclusion

The BPMA would like to have an e-learning tool that can help “drive the transformation of the BPMA from a limited-access business archive into a modern, open-access social history museum” (Andy Richmond, personal communication, February 10, 2012). This tool should be interactive, like the benchmark games we reviewed, in order to bring the BPMA on par with competing London museums. It should be adaptable, so that when the museum moves to the New Centre, it can be used in physical exhibits. Ideally, our tool will be one of many used in the New Centre. It is our job to consider the needs of our sponsor, current tools and forms of e-learning, and feedback from our target audience to develop an interactive prototype that enhances the visitor experience at the BPMA.

## Methodology

The goal of this project was to evaluate different e-learning programs and design a cost-efficient and interactive prototype to our sponsor. Our project group identified five objectives necessary to complete our goal: (1) characterize the state-of-the-art in e-learning in museums; (2) clarify the BPMA's purpose in developing e-learning options; (3) develop content and design prototype structure; (4) evaluate a prototype; and (5) recommend how BPMA should proceed.

### Objective 1: State-of-the-Art E-Learning in Museums

To better define state-of-the-art in e-learning, and its development over the past decade, our literature review above covers the progression of e-learning in museums. We found that the implementation of technology in museum environments can enhance the visitors' experience, and can help museums become a modern form of entertainment for families and school groups. Museums can use e-learning to teach educational material in new, engaging ways.

Through our literature review we have determined the key features that make e-learning tools effective, approved by our sponsor. E-learning experts Erin DeSilva, Jessica Caron, and Amy Stevens all directed us to utilize a criteria checklist when reviewing e-learning programs. Therefore, we developed a ranking system to be used by our group in evaluating existing e-learning programs based on the following categories. All four group members contributed to ranking decisions. Each category was rated on a scale of one to three, three (3) being very good, two (2) being neutral, and one (1) being poor. By default, all rankings follow this system. The specifics for each category are listed below. Refer to Appendix B for the ranking system forms.

1. **Ease of Navigation:** From personal experience and literature review, e-learning tools that are easy to navigate keep users engaged. According to a study conducted at the University of Pittsburgh, simple navigation greatly improves the learning process (Sosnovsky, Sergey 2008). Tools that are difficult to navigate tend to frustrate users. Amy Stevens, Manager of Learning Management Systems at Southern New Hampshire University, states that users should not need a manual to understand how to use an e-learning tool (personal communication on Feb. 22, 2012). In this case, a

- one (1) means that the tool was difficult to navigate, and a three (3) means that the tool was easy to navigate.
2. **Level of Interaction:** From our literature review and personal experience, tools that involve more feedback from the user are more entertaining and hold the user's attention for longer. A tool ranked one (1) in this category was non-interactive and didactic, and a three (3) means that the tool was interactive and constructivist.
  3. **Clear Communication of Content:** Clear communication of educational content is an important consideration when evaluating an e-learning tool. According to Kim, Oh, Yang, and Kim (2009), communication has a quantitative relationship with the engagement of the user. In our evaluations we quantified this by defining a score of one (1) as unclear communication, and a three (3) as clear communication.
  4. **Relevance to Key Stage 2 Curriculum:** Our sponsors have advised that the target audience for our e-learning tool is children ages 7-11 in Key Stage 2. Key Stage 2 encompasses the 3rd through 6th year of schooling for English children. This is equivalent to 2nd through 5th grade in the United States. We have researched components of the Key Stage 2 curriculum found on Schemes of Work, a website that provides teachers with sample topics appropriate to teach at that level (Schemes of Work, 2009). This helped us create a tool that can also be used by teachers in schools as a way to supplement their teaching classrooms. In our evaluation, a one (1) means that the content is irrelevant to Key Stage 2, a two (2) means that the program has aspects that can be applied to Key Stage 2, and a three (3) means that the content is specifically tailored to Key Stage 2.
  5. **Visual Elements:** The visual elements of a game are influential throughout gameplay. Both their presence and absence will enhance the mood of the game, as well as the level of entertainment and engagement. This was also supported by research done by Kim et al. (2009). They quantified how images and attractiveness relate to perceived entertainment and engagement. During this research it was found that images directly relate to both entertainment and engagement, while attractiveness was only linked to engagement. A one (1) in this category means the visual elements were unattractive, while a three (3) means the visual elements were attractive.

6. **Auditory Elements:** Through personal experience, e-learning tools with detracting auditory elements are likely to deter a user. A one (1) means that the auditory elements (or lack thereof) were disruptive to the tool, a two (2) means that the auditory elements (or lack thereof) were neither disruptive nor enhancing, and a three (3) means that the auditory elements (or lack thereof) enhanced the tool.
7. **Age Appropriate (7-11):** This is relevant to our project because this age range was assigned as our target audience, and it is important for us to understand what tools work well for them. This category covers our best estimate of content appropriate for the younger end of our age range and how they can interact with technology. A one (1) means the tool is inappropriate or too advanced, and a three (3) means the tool is suitable.
8. **Level of Entertainment:** Through personal experience, entertaining tools are more likely to keep the attention span of the user. A one (1) means that the tool was boring or not engaging. A three (3) means that the tool was fun and engaging. This was ranked based on our best estimate of how our target audience would interact with the tool.

## Benchmarks

This ranking system was then used to evaluate benchmarks programs provided by our sponsor, as mentioned above in our literature review, and other tools we found on museum websites. Some of the games are *WebQuest*, the Science Museum Online Games, and the Museum of London Online Games. They were selected by our sponsor because they are known to be both educational and entertaining. Refer to the Data & Analysis Chapter to view rankings of the games we evaluated.

## Other London Museums

We visited London museums and evaluated e-learning tools used in their exhibits. Those museums included The Museum of London, London Transport Museum, London Science Museum, and Bank of England Museum. Through our literature review we determined the key features that make e-learning tools effective, approved by our sponsor. We developed a ranking system based on the following categories. Each category is rated on a scale of one to three, three being very good, two being neutral, and one being poor. By default, all rankings follow this

system. The specifics for each category are listed below. In addition to conducting evaluations, we have included a short description of the program and the platform.

1. **Was this tool easy to find?** – This helps us understand how e-learning tools are presented in a museum environment. One (1) means that the tool was difficult to find on the museum floor, and a three (3) means the tool was easy to locate.
2. **Is this tool easy to navigate?** – Refer to Ease of Navigation in our Online E-Learning Evaluations ranking system.
3. **How interactive is the tool?** – Refer to Level of Interaction in our Online E-Learning Evaluations ranking system.
4. **Is the content relevant to the exhibit?** – Through a brief provided by Creative Research, and discussions with our sponsor, the importance of the link between museum technology and educational content of the exhibit was highlighted. A one (1) means that the educational content of the tool was not relevant to the exhibit, and a three (3) means the educational content was pertinent to the exhibit.
5. **Is the educational value of the content age appropriate?** – Refer to Age Appropriate in our Online E-Learning Evaluations ranking system.
6. **Is the educational material clearly communicated?** – Refer to Clear Communication of Content in our Online E-Learning Evaluations ranking system.
7. **Is the content relevant to Key Stage 2 curriculum?** – Refer to Relevance to Key Stage 2 Curriculum in our Online E-Learning Evaluations ranking system.
8. **How appealing are the visual elements?** – Refer to Visual Elements in our Online E-Learning Evaluations ranking system.
9. **Do the auditory elements complement or detract from the e-learning tool?** – Refer to Auditory Elements in our Online E-Learning Evaluations ranking system.

This ranking system was applied to e-learning tools we found during visits to the Bank of England Museum, the London Transport Museum, the Museum of London, and the London Science Museum. We evaluated 11 different kinds of tools used on different platforms. Refer to the Data & Analysis Chapter to view rankings of the tools we evaluated.

## Objective 2: BPMA's Purpose in Developing E-Learning Options

In order to clarify the purpose of the BPMA's venture into digital learning, we reviewed the e-learning tools they currently have at their disposal as part of our literature review. At this point, their e-learning offerings consist of downloadable learning packs and an online archive of their collection. These learning packs incorporate primary documents and are primarily targeted towards a classroom setting. Although they are very educational, these learning packs are not interactive and are not suitable for families with children. The BPMA recognizes this and is looking to design a more interactive tool.

The BPMA expected this e-learning tool to fulfill several objectives. These goals were discussed in our meetings with the staff as well as in the brief from Creative Research (Creative Research 2012). The BPMA would like to integrate this tool into their new exhibit; the goals of this exhibit include "showcas[ing] the breadth and depth of the BPMA's unique collections and the stories that they tell," "rais[ing] awareness of... British postal history," and "overcom[ing] the widely-held perception that postal heritage is a niche subject" (Creative Research 2012). As part of the new exhibit, the e-learning tool needed to address these needs.

In our discussions with the sponsors, the BPMA identified a target audience that this tool will have to cater to. Although the tool will be accessible to all users, it will primarily target children in the Key Stage 2 age range, or between 7 and 11 years old. The tool will need to appeal to families visiting the BPMA recreationally as well as teachers that bring their class to the BPMA to supplement their curriculum. The tool must be appealing to both the children in terms of entertainment value and to their teachers or parents in terms of educational value. To fulfill this goal, the tool will need to follow the UK National Curriculum.

## Objective 3: Develop Content and Design Prototype Structure

Based on our research, we found that the most effective e-learning tool for the BPMA is an educational game that will be implemented in the new exhibit and on the BPMA's website. Both our literature review and our evaluations of online e-learning tools supported this conclusion. Since the BPMA would like this tool to be implemented both in-museum and online, an informal learning tool would be more conducive to their purposes. An informal learning approach would allow for a product that both engages and educates the target audience on postal history. In addition, a game has the potential to incorporate elements of both collaborative and

individual learning in terms of feedback. An interactive game would provide the user with constant feedback based on the user's input, while feedback from other players can be implemented as well. As part of our evaluations, we rated each online e-learning tool in the categories described in Objective 1. We found that the majority of the tools given to us as benchmarks include a gaming component. Our evaluations showed that generally, games are highly interactive, visually appealing, age appropriate for our target audience, and capable of communicating educational content clearly and effectively. This confirmed our findings from the literature review.

Having chosen a game as the most effective option, we proceeded to identify topics in postal history that would fit the needs of the BPMA as well as the target audience. Based on our discussions with the BPMA and the Creative Design brief, we determined that the game must include facts about postal history that will interest the user. During the gameplay, the user will be presented with stories that show the relevance of the post office to the user's prior knowledge and personal experience. In addition to finding interesting stories within postal history, we consulted the Schemes of Work to determine important topics covered in Key Stage 2 of the National Curriculum. In order to create educational content that parents and teachers will approve of, we attempted to use pieces of postal history relevant to topics in the National Curriculum. This will make our game a good supplementary tool for teachers to use with their students. For more detail on the game content, refer to the Design and Mini-Games chapters.

In addition to developing game content, we created a structure that will fit the BPMA's plans for the new exhibit. To accomplish this, we held several meetings with the BPMA and referred to the Creative Design Brief. Since the tool will be integrated into the exhibit, we concluded that the structure of the game should follow the layout of the physical exhibit. This game will also be implemented online, making it available for families to use at home. Thus, the structure of the game within the exhibit will have to be implemented in the online version of the game. Since the BPMA's exhibit is likely to go through changes in the future, the structure of this game must be flexible enough to adapt. For more detail on the game structure, refer to the Design section.

To determine how our target audience interacts with educational games, we interviewed parents with children in the Key Stage 2 age range at the BPMA's Family Fun Day on March 31, 2012. We asked the parents about the video games their children play, the educational



components of these games, how the kids are introduced to these games, how the parents are involved in the gameplay, and what platforms the kids use. We found that most of the children play games for both education and entertainment purposes. The parents appeared to favor educational games; some parents only allowed their children to play educational games, while others allowed both educational and purely entertaining games. The children find educational games with the help of parents, teachers, and sometimes on their own. The majority play these games both supervised and unsupervised. The platforms they typically use are computer, iPhone, iPad, and Wii.

#### Objective 4: Evaluate a Prototype

Given the lack of time and programming experience, we could not implement a working prototype of this game. Therefore, we presented our optimal prototype using a storyboard approach. We drew out the different playing screens that we envision being part of the game. These storyboards described the different aspects of the gameplay. Since our game involved multiple mini-games, we sketched out the different mini-game ideas as well as a general map of the game.

To evaluate these storyboards, we interviewed families in our target audience. The museum held two visitor events during our stay. The first was Family Fun Day on March 31, 2012. We presented our storyboards to seven families with children in the age group we are targeting. The parents approved of our games ideas, praising the educational and entertainment components. We also asked the parents to evaluate the difficulty of our game proposal, and they responded that our game is at an adequate difficulty levels for their children. The second event was Mail Rail Open Day on April 21, 2012. This day was targeted towards independent adult learners and provided us with some constructive feedback on our storyboards.

In addition, the BPMA continuously evaluated our progress and provided feedback on our prototype. Having completed a game prototype that satisfies all of our requirements and the BPMA, we provided the BPMA with recommendations on how to implement the prototype.

#### Objective 5: Recommend how the BPMA should proceed

The BPMA has options in implementing our storyboard. The game will be featured on the BPMA's website as well as in the New Centre. We will consult our sponsor to assess their options of implementation. We recommended the types of technology best suited to present our

game. The BPMA has to determine which platforms to use for in-museum implementation: touchscreen, computer/mouse, or a mix of physical and digital components. Our recommendations depend on the space available at the New Center and the estimates of the costs involved in implementing each platform. To estimate the costs, we used information collected by Alison Bean and interviewed a museum expert about development costs. We also reviewed the Creative Design brief to determine how the game will fit into the new exhibit.

## Data and Analysis

In addition to our literature review, we collected data through interviews and evaluations to guide our design decisions. Data collection began in Worcester, where we interviewed three e-learning experts who worked in university learning settings. In London, we interviewed an e-learning expert whose knowledge comes from working in a museum setting. In addition to our interviews, we analyzed e-learning programs offered online and in several London museums.

### Data from Interviews with E-Learning Experts

*Amy Stevens, Manager of Learning Management Systems at Southern New Hampshire University*

Amy Stevens manages the LMS at Southern New Hampshire University. Her experience with e-learning tools provided us with valuable insight into the future of e-learning applications. We developed an interview script for this interview that can be found in Appendix E. Highlights from her interview include:

- Users shouldn't need to read a manual to understand how to use an e-learning tool.
- Programs should be self-contained; students shouldn't need to wander around the Internet looking for data.
- To evaluate e-learning tools, use checklists. Key features include:
  - Navigation
  - Look & Feel (Visual & Audio)
- Since Ms. Stevens works for a university, we asked if she could help us learn about e-learning programs for children:
  - Main experience with e-learning options for children comes from what she has learned as a parent. Her children are 8 & 10 years old. From an e-learning standpoint, games that include virtual worlds are most appropriate for children.
  - Her only work experience with e-learning for children is the "Angry Birds" method, where users can repeat levels until they master them, with rewards for moving on.

- When asked if the future of e-learning will lean towards the virtual worlds and rewards system, Amy says, “it has to.” People spend a considerable amount of time gaming, and children learn to utilize technology at a young age.
- After explaining our problem statement, involving the need to develop a prototype of an e-learning tool for children for a museum, we asked for recommendations:
  - Amy said, “You could probably get far more creative with an app-like device than you could with an LMS.” She explained that not only are the current LMS systems primitive, but that App-Based programs are ideal for museum environments.

Our interview with Amy Stevens helped us begin our design process. We agreed that we should work to develop an “app-like device” as Ms. Stevens suggested. We hoped to develop a tool that followed the “Angry Birds” approach, giving users as much time as the need to complete levels. Ms. Stevens’ suggestion about utilizing a criteria checklist when evaluating an e-learning tool helped guide our evaluation process.

*Erin DeSilva and Jessica Caron, Academic Technology Center at Worcester Polytechnic Institute*

Erin DeSilva and Jessica Caron work at the Academic Technology Center at WPI. Both Ms. DeSilva and Ms. Caron have experience in development and analysis of e-learning applications. We developed an interview script for this interview that can be found in Appendix E. Below are the highlights from their interview:

- “Edutainment is a challenge.” It is difficult to balance the educational and entertainment components when designing an e-learning tool.
- Since the BPMA doesn’t have a physical exhibit yet, we should consider augmented reality applications.
- QR Codes are a good way to incorporate technology into a museum exhibit. However, they will only be able to reach a certain audience (those with smartphones and a QR reader app).
- Interaction is a big piece - how will children interact with our product? Will they interact with each other/other people at the museum (collaborative learning)?

- Key Stage Curriculum should be consulted if school groups are part of the target audience.
- When asked about choosing between different e-learning tools, Jessica said, “Pick the tool that’s going to meet your objective, not pick the tool and then force it to meet your objective.”
  - “Having a set of tools and a sample set of objectives that they might meet - great. Having some objectives from the museum that they might meet - great... But it’s not about the tool. The tool is a vehicle, not the driver.”
  - E-learning tools should be evaluated based on our learning objectives.
  - Usability is an important factor when evaluating an e-learning tool. The tool must be accessible to all the users in the target audience.
    - In terms of the school group target audience, we need to limit the grade range that our tool will target.
    - The tool must be interesting enough to engage the younger range of the target audience.
  - Level of interactivity is another important criterion in the context of e-learning tools.
  - Touchscreens require a whole separate type of development as opposed to, for instance, online games.
- The interview transitioned from talking about e-learning tools to e-learning games. Jessica and Erin began talking about development.
  - If the BPMA contracts out this tool/game to development & content experts, there should be a team of roughly 15 people to develop the e-learning tool.
  - Once the tool is in place, the maintenance of it should be taken into account.
- “How much do they want their content experts to become media experts?”
  - Can the BPMA involve in-house staff to some extent in terms of managing the tool’s content?

Their suggestions about evaluating e-learning tools based on a set of objectives greatly helped our evaluation process and our design process. We set a design goal of achieving the right balance of education and entertainment in our e-learning tool. Building off that, we considered the National Curriculum the basis of the educational aspects of our tool. Ms. DeSilva and Ms.

Caron brought up an important point about managing e-learning tools, in the sense that we need to be sure that BPMA staff can be responsible for maintaining an e-learning tool once it is implemented.

*Rhiannon Looseley, Online Learning Manager at the Museum of London*

Rhiannon Looseley is the Online Learning Manager at the Museum of London. She has experience with e-learning applications in a museum setting. We developed an interview script for this interview that can be found in Appendix D. Highlights from her interview include:

- When new exhibits are built, if an interactive is involved, it is built along with exhibit
  - Next step after our proposal is to find design companies and brief them.
- Ballpark costs for games can range from £5,000 to about £30,000 - £40,000.
  - After describing our game, this cost will fall towards the higher end of that range.
  - Companies like to work with obscure museums; it's a deviation from their norm.
- Rhiannon said the Museum of London has no major issues developing e-learning games since they outsource the game development.
- The Museum of London develops e-learning tools targeted to specific Key Stages, making them more appealing to teachers.
  - New education reforms might change specifics on Key Stage Curriculum.
- E-learning programs at the Museum of London received extremely positive feedback, especially with handhelds (iPad, iPod, etc.)
  - Rhiannon sees the future of e-learning as mobile based, utilizing QR codes.
- After we explained our prototype idea:
  - Rhiannon really liked our avatar creation method. She described it as “brilliant.”
  - British Music Experience offers an in-museum e-learning tool where visitors' tickets can be scanned in at points around the exhibit, customizing their experience and allowing them to continue online. The website with a description of the BME Smarttickets is: <http://www.britishmusicexperience.com/smarttickets>.
- Data security: we need to be clear how we would use personal information if it were given.
- Rhiannon explained that sometimes the development process of museum interactives is hindered by a lack of communication between different development teams. To avoid

this, she advised that museum interactives should be developed alongside and as part of museum exhibits.

- In terms of adapting a game from a touchscreen to the web, Rhiannon has run into problems with file size in the sense that you cannot have too large of a file on the internet.
- We asked about how the educational aspects of our proposal should be presented to teachers:
  - For our final proposal, Rhiannon recommended we provide teachers with exactly what criteria each game will cover in terms of the National Curriculum.
  - The Museum of London sends a newsletter email to teachers. Once this prototype is fully implemented, it is possible that the newsletter can include links to the BPMA's game and website.
  - Give teachers access to images and information on inventory items that show up during gameplay.

Since Ms. Looseley's interview took place much further into our design process than our interviews with Ms. Stevens, Ms. DeSilva, and Ms. Caron, we were able to ask more detailed questions about the implementation process of museum interactives. Due to the time constraints of our project, we were only able to leave the BPMA with recommendations for implementing our e-learning tool. Ms. Looseley's interview helped guide our recommendations to the BPMA. We found it important to suggest that our e-learning tool be developed alongside the plans for the BPMA New Centre. We also recommended that the BPMA look into several different contactors to find the best price available. We also recommended that the tool could be implemented on smartphones and tablets.

## Online E-Learning Evaluations

To better understand what e-learning tools already exist on the websites of other London museums, we looked into evaluating these tools based on a set of criteria. The descriptions of evaluation criteria are located in the Methodology chapter. Through these evaluations, we were able to see what kinds of tools excelled in different criteria. This information allowed us to develop our own tool that would also excel in these areas. The first step in evaluating existing e-

learning tools began in Worcester, as we started to compile a list of online e-learning programs to evaluate. These programs were picked based on communications with our sponsors.

*WebQuest* is an e-learning tool provided by the Victoria & Albert Museum. It was intended to be used in a classroom setting, and provides notes for teachers on how to present material to students. Though this game was very educational, it makes students search the Internet to find answers to questions. During an interview on February 23, 2012 with Erin DeSilva, an e-learning expert at WPI, we determined that users should not need to search the Internet to complete tasks assigned in a tool, that a tool should be a standalone learning option. Although this game was very relevant to the Key Stage 2 curriculum, it could have been more interactive and could have benefitted by the inclusion of audio.

*The Great Fire of London* is an e-learning tool used by the Museum of London. Users are guided through a story following two key figures alive in the time of the Great Fire of London. This is easy for users to relate to, and is based on primary sources like diary entries, eyewitness reports, books, and paintings. This game is very appropriate for our target age group, and fits well with the Key Stage 2 National Curriculum about the Great Fire of London.

*Launchball* was a game on the London Science Museum's website. The gameplay was engaging and taught simple physics principles. As mentioned in the literature review, random facts were displayed after each level, giving it lower scores in relevance to the exhibit and clear communication of content.

*Energy Flows* was another game provided by the London Science Museum. Users learned how to convert one form of another to another by filling in pieces of a flow chart. The educational content of this game was very clear, and very appropriate for our target age range. This game's strengths were highlighted in the overall simplicity of the game, showing that not only complex tools can score high.

*Grain Strain* was also on the London Science Museum's website. It was a simple game where the user is given several conveyor belts moving in different directions and at different angles. The goal is the use the conveyor belts to filter grain falling from ducts into buckets below. Though we think this is appropriate for our target audience, it was not very entertaining play.

*Create a Costume* was an easy level game provided on the Museum of London's website. Users were given the option of creating a dress, shoes, or a jacket. To decorate the article of



clothing they chose, users were given several shapes they could drag and drop to design patterns, and colors they could mix to color their designs. They were given examples of clothing like the ones they were designing in the museum. This game was very entertaining, but simplicity of it put it below our target age range.

*Time Pirates* was a quest game found on the London Science Museum’s website, though it was initially developed for PortCities, London, a company that teaches maritime history of the London area. In this game, users have the option of signing in or playing as a guest. Users are presented with a storyline about a mad scientist sending pirates to steal items from the past, and are told they need to help catch the pirates and save the items. Users are taught history and allowed to explore historical environments through the game. This game was very interactive and entertaining, only having room for improvement in the audio department.

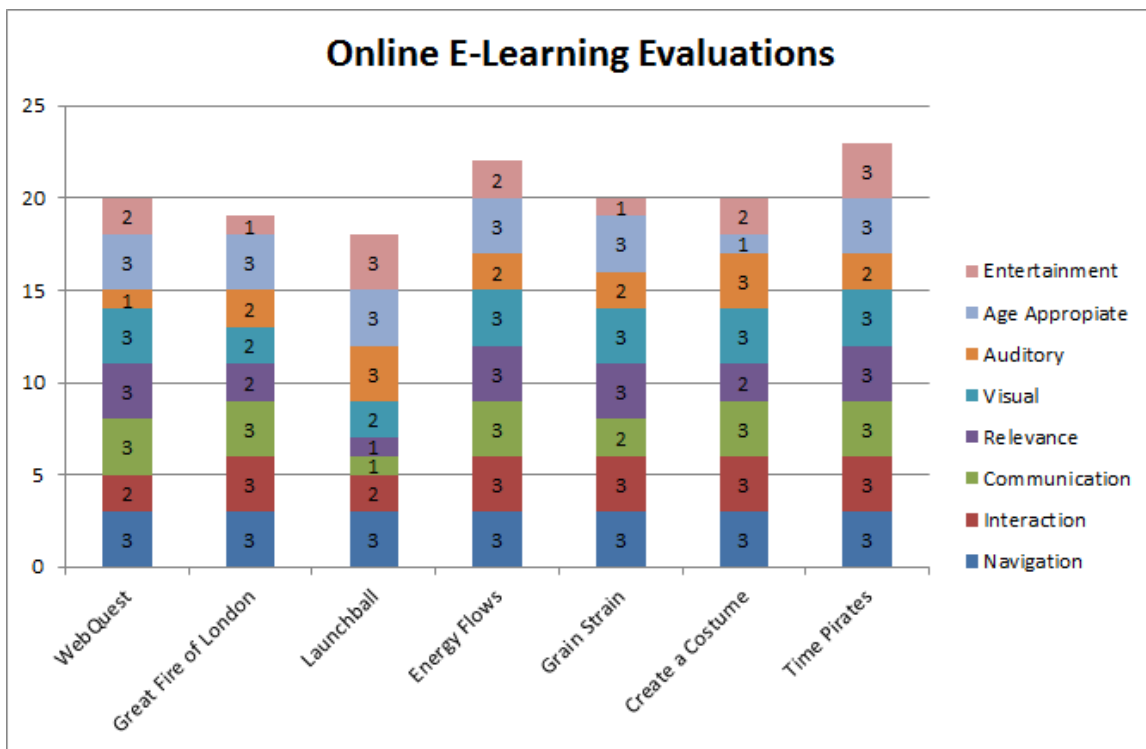


Figure 2 - Online E-Learning Evaluations

### In Museum E-Learning Evaluations

Our next set of evaluations included evaluating e-learning tools at The Museum of London, London Transport Museum, London Science Museum, and Bank of England Museum. We used the in-museum ranking system described in the Methodology chapter.

The *Hot Air Balloon* tool at the Bank of England Museum was a game that taught users about inflation. Users walked into a hot air balloon basket with a computer screen that displayed a hot air balloon flying. There were two handles hanging from above that users could pull, one red and one green. The goal was to keep the balloon flying at a steady height by pulling the green handle to raise the balloon and the red handle to lower it. Overall, the game was fun, interactive, and easy to use, but not very educational.

*The Future is Nearly Now* at the London Transport Museum was an informative touchscreen setup. Each touchscreen featured different topics relevant to futuristic items presented in the room, with videos from experts and informative articles relative to the exhibit. Though it was interactive and visually appealing, *The Future is Nearly Now* is not appropriate for our target age range.

The London Transport Museum had an interactive game that allowed users to mimic driving tube trains in London. This game was titled *Driving Train*. Users walk into a small, play tube train car, where a screen displaying a view similar to what a tube train driver sees out the front window is displayed in place of the window. One user can sit in the driver seat and control the speed of the train's motion on the screen by moving a lever. This game is not very educational, but very appropriate for our target age range.

*Changing London* was a touchscreen e-learning tool used at the Museum of London. In an exhibit focused on London's advancement post-WWII, a small touchscreen was implemented as a job finder. Users selected their gender and answered multiple choice questions about what sort of work they like to do. The tool informs them what their job would be and what their wages would be. Each time, the screen displays a cash machine giving the user their pay check, then takes their wages back to show how highly taxed people were at the time. The material presented was educational, and fit with Key Stage Curriculum in terms of learning how people in history lived. However, the visual elements were very rudimentary and the method of answering the questions was not highly interactive.

*London Before London* was a virtual tour and quiz in the Museum of London. Several computer/mouse stations were set up where users could read more information about the exhibit they just viewed, and answer quiz questions about it. This didactic form of learning was not a very effective way of educating users, and was not appropriate for our target age range.

*Medieval London* was another computer/mouse setup in the Museum of London. This was more interactive, however, since users were given information and several different games to play. Some of these games were available on the Museum of London website for users to play at home, and others were only available at the Museum. We specifically evaluated a game called *Back to School*. The game took a long time to load, but was a quiz game held in a Medieval classroom. Though quizzes are not the most interactive form of education, the game's educational content was very age appropriate and fit the Key Stage 2 National Curriculum well.

In the *People's City* exhibit at the Museum of London, there was a small room called Struggle Within, in which the walls, floor, and ceiling covered in a large map of London. On the back wall of the room was a large touchscreen with a continuation of the map. This part of the map allowed users to zoom in and out on the city of London, and view historical demographics and journal entries relative to specific areas on the map. Though the content was highly educational and could fit the Key Stage 2 Curriculum, it was not presented in a way that was age appropriate for our target audience.

The London Science Museum had one area dedicated to science news called *Antenna Science News Now*. Many touchscreens displayed different news stories that users could rate, rate, and answer polls about. Though it was easy to navigate and clearly educational, this e-learning tool was not age appropriate or relevant to Key Stage Curriculum.

*Who Am I?* was a game featured in the London Science Museum. A large table in the middle of an exhibit about self-discovery featured several touchscreen stations. Users created a character with their initials, gender, age, likes, dislikes, and favorite colors and foods. Users can play games and compete with other users at the table. Once the character was complete, it was displayed on one of the walls of the museum via a project screen. *Who Am I?* achieved the highest possible score of 27 points. It was highly interactive and engaging, appropriate for our target age range, and visually appealing.

In the Atmosphere exhibit of the London Science Museum, we evaluated an e-learning tool called *What's Causing the Warming?* that consisted of an interactive book and computer screen. The book's pages had very simple designs that animated on the screen over it as the pages were turned. Although the educational content could have been clearer, and simply turning

the pages of the book was not highly interactive, *What's Causing the Warming?* is not severely lacking in any one area.

In the Energy exhibit of the London Science Museum, we evaluated a touchscreen e-learning tool called *World Energy*. In *World Energy*, the user interacts with a retiring Prime Minister of Energy, who assigns the user to take over her job. The game takes a picture of the user and puts it in a newspaper headline reporting them as the new PM. As PM, the user needs to place different kinds of energy harnessing sources in different areas of the UK. Users learn where it's safe to put nuclear power plants, wind farms, solar panels, etc. Throughout the game, the retiring PM reports to you on how you are doing. It was overall very interactive, appropriate for our target audience, visually appealing, and relevant to the exhibit.

These tools can be divided into several categories to help us analyze the information we collected. The first division was by platform. We created a chart divided into the three basic types of platforms: physical/digital combination, touchscreen, and desktop computer. The scores were calculated based on the averages in every category of all tools of similar platforms. The tools we evaluated that fell under the physical/digital combination category were *Hot Air Balloon*, *What's Causing the Warming?* and *Driving Train*. The tools that used touchscreens were *The Future is Nearly Now*, *Changing London*, *People's City*, *Antenna Science News Now*, *Who Am I?* and *World Energy*. The tools that used a desktop computer were *London Before London*, and *Medieval London*. Overall, desktop computers scored the lowest ratings, while touchscreens scored highest. This helped us decide we should implement our e-learning tool on a touchscreen in the BPMA's New Centre.

The second division compared tools that were games to text-based interactives. Games ranked higher than text based interactives. Overall, games were most age appropriate for our target audience and taught Key Stage 2 Curriculum better than text-based games. They were also more interactive. This helped us decide to design a game for the BPMA. The tools that were labeled as games were *Hot Air Balloon*, *Driving Train*, *Medieval London*, *Who am I?*, and *World Energy*. The text based interactives included *The Future is Nearly Now*, *Changing London*, *London Before London*, *People's City*, *Antenna Science News Now*, and *What's Causing the Warming?*

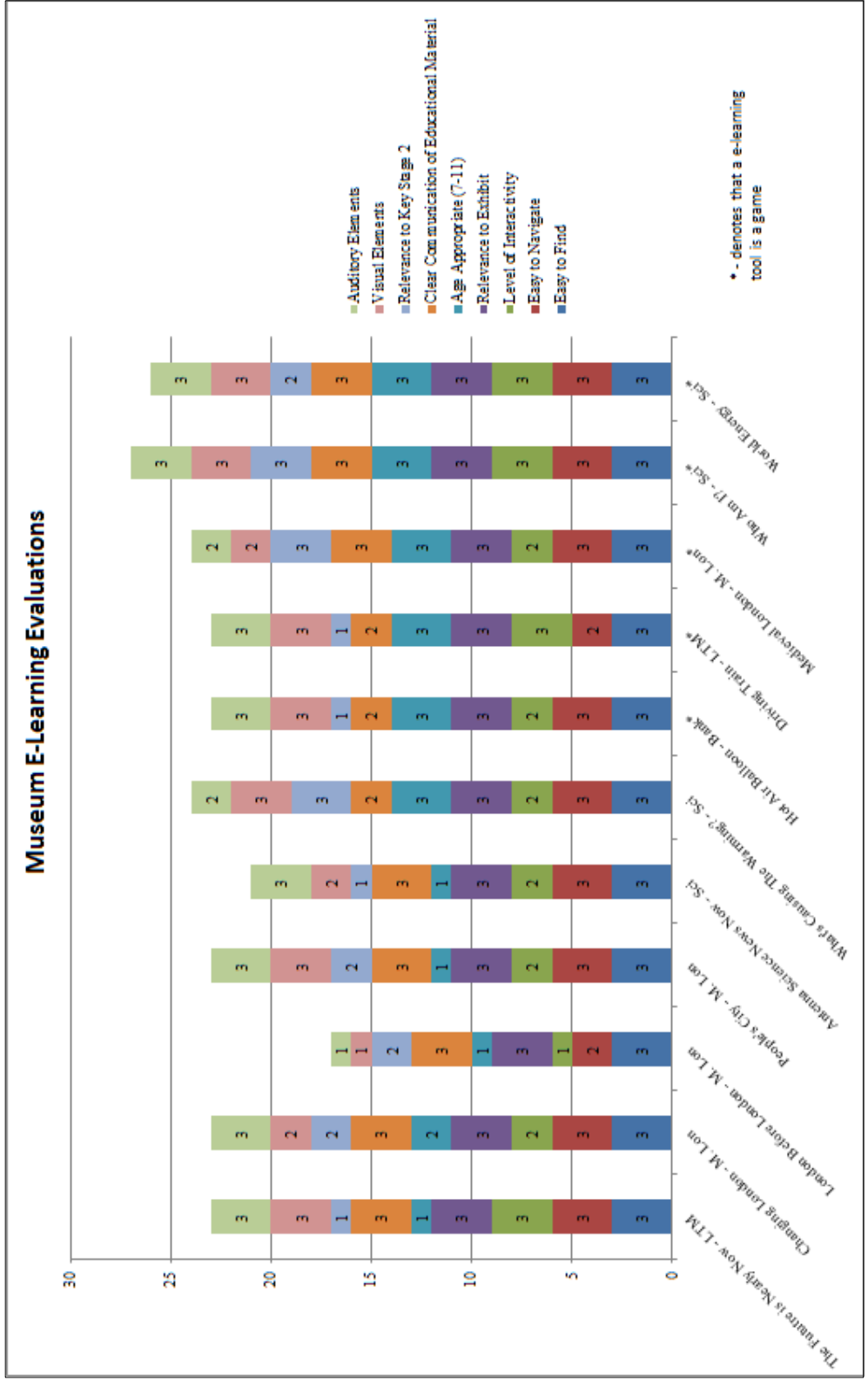


Figure 3 - Museum E-Learning Evaluations

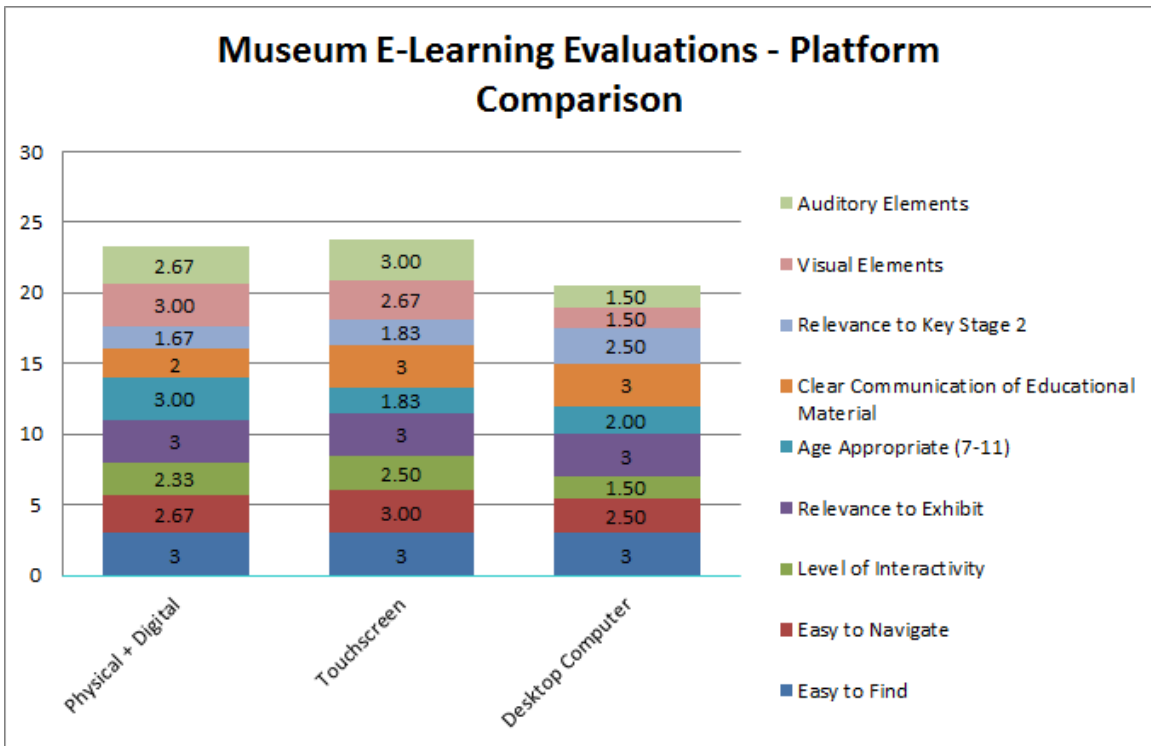


Figure 4 - Museum E-Learning Evaluations-Platform Comparison

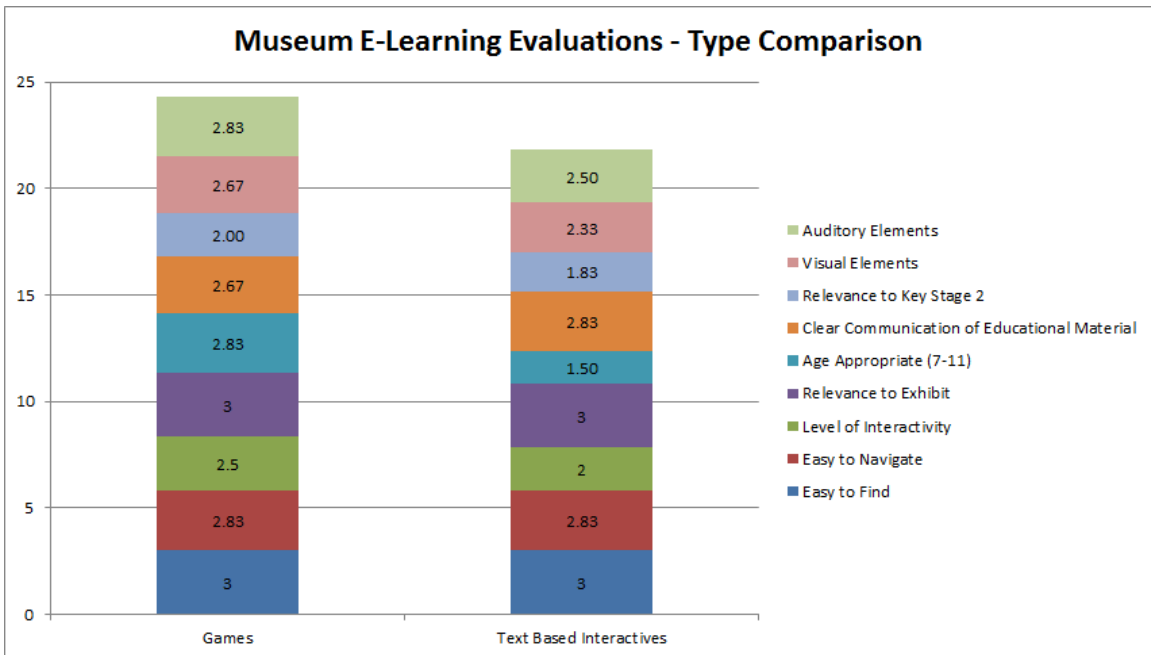


Figure 5 - Museum E-Learning Evaluations-Type Comparison

## Design

### Design Goals

In designing our e-learning game, we established a list of design goals that this game must meet. These goals were based on the needs of the BPMA, the needs of the target audience, and our own research. These goals were used as design principles to guide our design process. Our design accomplishes the majority of these goals; however, some of these goals are meant for the contractor design team to address.

- 1. Appropriate for a primary user in the 7-11 age range**

Given the target audience for this game, our design must be appropriate for children ages 7 to 11. Part of this design goal is to make the navigation of the game accessible and intuitive for this age group. Based on our literature review, the game must also be visually appealing, and have complementary audio. A study of various video game features concluded that graphics and sound are the top two qualities that make a game enjoyable (King, Delfabbro, Griffiths 2010). Based on a recommendation by Andy Richmond, Learning Manager of the BPMA, the game should engage the user with a “hook” – an interesting first impression that motivates users to play. In addition, the language in the game should be at an appropriate level for this age range to facilitate understanding of the material.

- 2. Key Stage 2 Relevance w/ direct ties to Schemes of Work (National Curriculum)**

The main objective of this game is to teach the user about postal history. Therefore, it must contain a lot of educational material. Given that the BPMA’s target audience includes school groups ages 7-11, a significant portion of the game content needs to be relevant to the Key Stage 2 section of the National Curriculum. To make this game appealing to school groups, the content of the game should have some relevance to what the children are learning in classrooms. To determine how a visit to the New Centre would complement their classroom material, teachers need to understand the link between the postal history incorporated into these games and the topics they cover in class. Since different schools follow slightly different curricula, we decided to use the National Curriculum as guidelines for our game content. This educational

component should appeal to parents as well, who, based on our interviews with families, are likely to encourage their kids to play a computer game if it has an educational component.

3. **Clear communication of educational content**

The educational content described in design goal #2 must be clearly explained in the game. Since school groups are a section of the target audience, teachers should be able to see the value of these games. To accomplish this, the tool should make it easy to see what the game is trying to teach. As mentioned in design goal #1, this educational material must be communicated in language appropriate for this age group.

4. **Reward features**

This game should include rewards for various achievements. According to Daniel King's video game study, reward features like leveling up and earning experience points will entice the users to continue playing the game and provide them with a sense of accomplishment (King 2010).

5. **Fluid storyline**

One of our aims is to ensure that the storyline of the game is fluid. Rather than having an assortment of disjointed game components, we plan to design a storyline that links all of the components together. The purpose of this goal is to make the game's narrative more engaging for players; in the study referred to above, "narrative elements (e.g., an interactive story) were... rated very highly by all players" (King 2010).

6. **Non-didactic, informal learning approach in terms of interaction between the program and the user**

The idea behind this design goal is to ensure that our game is interactive. While the didactic approach is very informative and educational, it entails a lot of reading or listening for the user, with very little interaction. Our design will include some of the educational aspects of didacticism, but it will seek to provide a high level of interaction between the user and the game; our literature review informed us that this approach is more interactive (Hein 1998). The game will be designed to be an



informal learning tool to accommodate for the family section of the target audience, who, unlike school groups, do not have the advantage of having an instructor around.

#### **7. Adaptability**

One of our most important design goals is adaptability. To satisfy the needs of the BPMA, the game must be adaptable to future changes in the exhibit. Since the exhibit is currently a work in progress, there could be a number of changes in it between current plans and the final exhibition. Our game needs to be able to adapt to these changes effectively so the BPMA does not have to create a whole new game every time they make a change in the exhibit.

#### **8. Link between game and physical exhibit**

As part of the BPMA's needs, we would like to establish a link between the game and the physical exhibit. The game and the museum exhibit should be closely connected.

#### **9. Encourage game users to visit museum**

At this point, the BPMA is a small and relatively unknown museum. Thus, it will be very important for them to attract visitors once the New Centre is built. This game should entice the game users to come back to the museum.

#### **10. Diminish stigma that postal history is a niche environment**

One of the BPMA's objectives is to "surprise, create interest and stimulate curiosity; consistently challenging and overcoming the perception that postal heritage is a niche subject" (personal communication, Andy Richmond, Feb 10, 2012). Many people consider postal history to be mundane, outdated, and rather irrelevant to their daily lives. The BPMA is attempting to break that perception and turn the new museum into an environment that the target audience can relate to. This can include presenting users with quirky facts about postal history, and telling interesting stories that users can relate to.

## **Content Development**

To develop the content for our game, "Mail Tales," we pulled information from two main sources: interactions with BPMA staff and referencing the National Curriculum. Our interactions with the sponsors provided us with details regarding what the content of the exhibits for the New Centre will most likely entail. This information allowed us to make connections between mini-

games and the exhibits in the museum. Since our game is in part being targeted to school children, we needed to develop educational content that would also match up with educational topics covered by the National Curriculum. Utilizing these two sources, we developed content for our game that was both educational and parallel to what the BPMA is looking to display in their future exhibits at the New Centre.

Information from the BPMA came in part from meetings held with members of the staff as well as the Creative Design Brief compiled by Creative Research. Creative Research is designing the BPMA's exhibits for the New Centre that are highlighting five key time periods in postal history. These time periods include:

1. The Early Days of the Royal Mail (1635 to 1837)
2. Victorian Postal Reform and Innovation (1837 to 1914)
3. The Post Office in Wartime (1914 to 1918 and 1939 to 1945)
4. The Golden Age of the GPO [General Post Office] (1930s to 1960s)
5. The Changing Post Office (1970s to today)

Meetings with members of the BPMA staff directed us to the BPMA archives. The archives provided us with many interesting facts that we incorporated into our design. These facts spanned across the five time periods that we looked to develop content for while still covering different components of postal history. Some of these facts included:

1. Cats were employed by Post Offices to catch mice – a famous postal service cat was Tibs.
2. Letters were burned in the Great Fire of London, and a man named James Hicke tried to save as many as he could.
3. Mail coach guards used an 'intamperable' time piece to note how long their journeys took.
4. Cross-written letters were used before uniform penny postage because sending multiple sheets of paper cost extra.
5. Traveling Post Offices (TPO) were used to sort and deliver mail. To ensure quick delivery, TPO's only slowed down drop off mail.

6. Uniform penny postage allowed people to pre-pay for postage. The monarch's head is always on the stamp.
7. Titanic carried mail and the postmen on the Titanic tried to save as many letters as they could. The BPMA also holds last telegraphs from the Titanic.
8. Postal service workers helped keep communication running smoothly during both world wars, including operating switchboards.
9. In WWII, the post office tried to have no more than 48hr delays on all letters. This meant postal workers had to comb through the rubble left by bombings to locate pillar boxes and mail.
10. Postal workers were also responsible for decoding enemy communications using enigma machines in WWII.
11. Working for the post office was a highly respected job, and many workers started off as messenger boys.
12. The original London postcode areas still exist today as the start of the modern London postcode (ex. E1 7HS is located east of central London).
13. TV licenses were originally sold through the Post Office, and TV detector vans were used to find individuals who owned unlicensed TV's.

We looked to include these interesting facts into the game design in order to show users of our game that postal history spans across many areas throughout history, showing up in ways that may not initially seem likely. We also consulted Laura Dixon to see what she teaches to schoolchildren on Family Fun Day as well as during school visits. This allows our game to build off of what she teaches about postal history. Our consultations with Laura led us to include postal uniforms as one of the components of our game.

To ensure that our game was educational and applicable to teachers and school groups, we consulted the National Curriculum to see what Key Stage 2 students were learning. The National Curriculum is organized by subject matter and each subject is divided into units. In addition to Literacy and Mathematics, students learn about Arts and Design, Citizenship, History, Geography, Design and Technology, Information and Communications Technology, French, German, Spanish, Music, Religion, and Science. Using information from our interactions with BPMA staff and our research into BPMA archives, we cross-referenced the National

Curriculum with the content of the BPMA’s future exhibits to compile a set of engaging, educational topics. Our research determined that certain historical aspects of postal history can be linked to the History, Art and Design, Geography, and Mathematics sections of the National Curriculum. The details of these connections will be discussed later in the Design chapter.

## Game Components

### Game Synopsis

The title of the game is “Mail Tales.” In “Mail Tales,” the player creates an avatar that travels through time and plays a number of mini-games in each time period. In his time travels, the player interacts with key figures and primary documents from postal history; the player is guided through different time periods by a former postal employee. The mini-games in each time period include facts and stories from postal history that are relevant to that time period. Each mini-game focuses on one particular topic of postal history. Users will receive rewards for completing mini-games and, under certain conditions, for visits to the museum.

### Overall Game Map

The structure of “Mail Tales” is illustrated in the form of a Game Map. Each island on the map represents a time period rather than a geographic location. These time periods include:

1. The Early Days of the Royal Mail (1635 to 1837)
2. Victorian Postal Reform and Innovation (1837 to 1914)
3. The Post Office in Wartime (1914 to 1918 and 1939 to 1945)
4. The Golden Age of the GPO [General Post Office] (1930s to 1960s)
5. The Changing Post Office (1970s to today)



Figure 6 - Overall Game Map

In the museum, each section of the game relating to each time period of postal history will be available in that part of the exhibit. Since we decided it would be beneficial to make “Mail Tales” available online, the online version features the Game Map as a resource for users, allowing them to navigate through time periods.

### Tibs the Cat

Cats had been employed at Post Offices to catch mice and rats from 1868 to 1984. One of the famous cats in postal history was named Tibs. The name “Mail Tales” comes from the two different spelling of the word tale: tale and tail, tail referring to a cat’s tail. In “Mail Tales” Tibs is not only a guide to the user but also a mascot for the game. Tibs introduces the users to periods of history, improving the flow of the storyline. Tibs could also be used as a guide in some of the mini-games to guide the user through the gameplay.

## Avatar Development

A major component of “Mail Tales” is avatar creation and development. When a user creates an account, they are led to an introduction screen with simple options for gender, hair style, hair color, eye color, skin color, and a ‘modern’ outfit (pants, t-shirt). Through gameplay, users can earn outfits and articles of clothing based on postal uniforms from various points in postal history (coats, hats, etc.). To easily incorporate this component, the user should have the option of changing their avatar’s outfit within the game.

## Mini-Games

The most important aspect of “Mail Tales” is mini-games. Each time period consists of several mini-games that teach different aspects of postal history. The user is introduced to each mini-game by a key figure from history or an excerpt from primary source. The key figures and primary sources were chosen based on their relevance to the educational content of each mini-game. The goal of the mini-games is to bring together education and entertainment. Due to the time limitations of our project, we have developed only three mini-games per time period, with the idea that the BPMA can add more games as exhibits change. For specific details and descriptions of mini-games, refer to the Mini-Games Chapter.

## Reward Features

### *Stamp Book*

Users can collect stamps throughout the game in the form of a digital stamp book. Users acquire a stamp with an image of their initial avatar just for creating their avatar. After completing each mini-game, users acquire a stamp relating to the game’s content. Each stamp in the book has a small description of how it was acquired and its importance. Users can see empty spaces for the stamps they have not acquired yet, as a motivation to complete their stamp book. Users can collect special edition stamps by visiting the museum and picking up special codes that can be redeemed online.

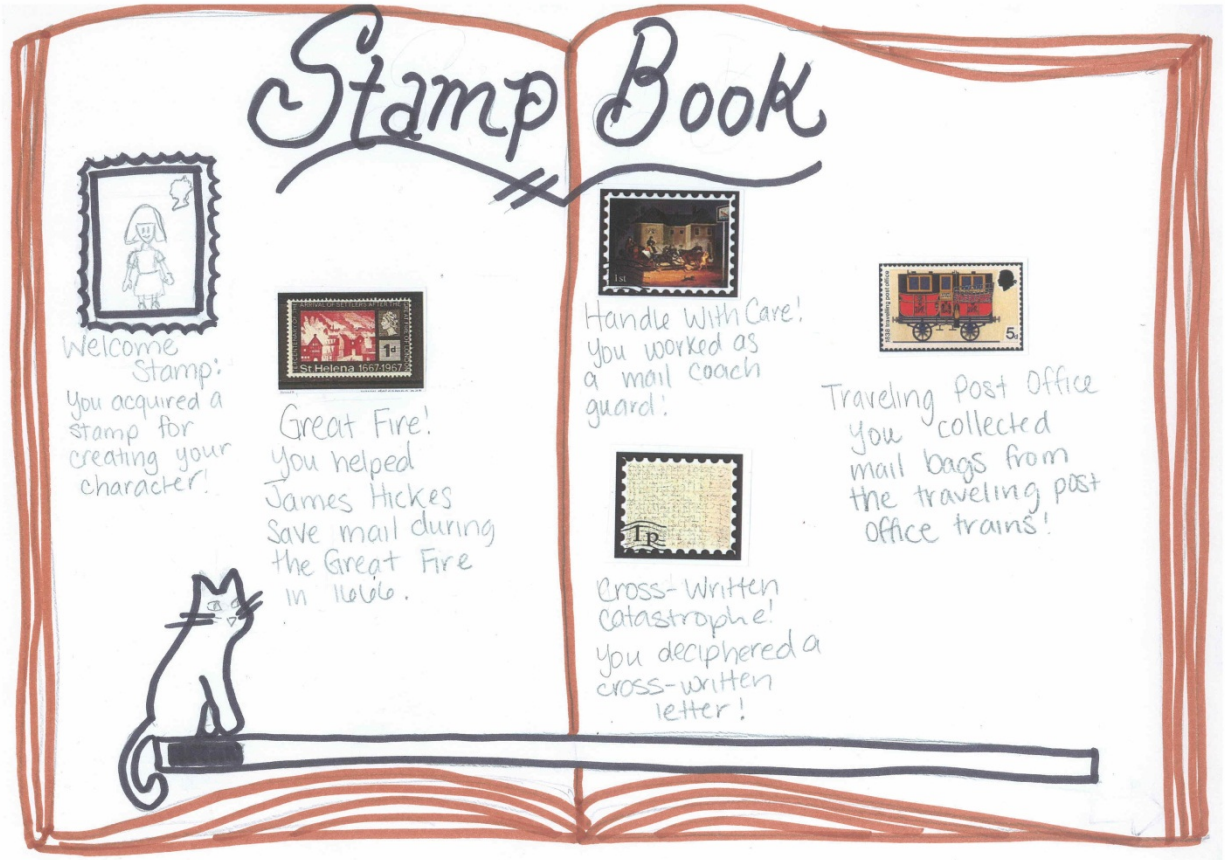


Figure 7 – Stamp Book

### *Inventory*

The user collects inventory items through their travels through time. This includes outfits and articles of clothing based on postal uniforms from various points in postal history as well as artifacts presented in the museum space. The user will be able to customize his avatar's outfit using the articles of clothing he collects. As with the stamps, special edition artifacts will be available in the museum exhibit.

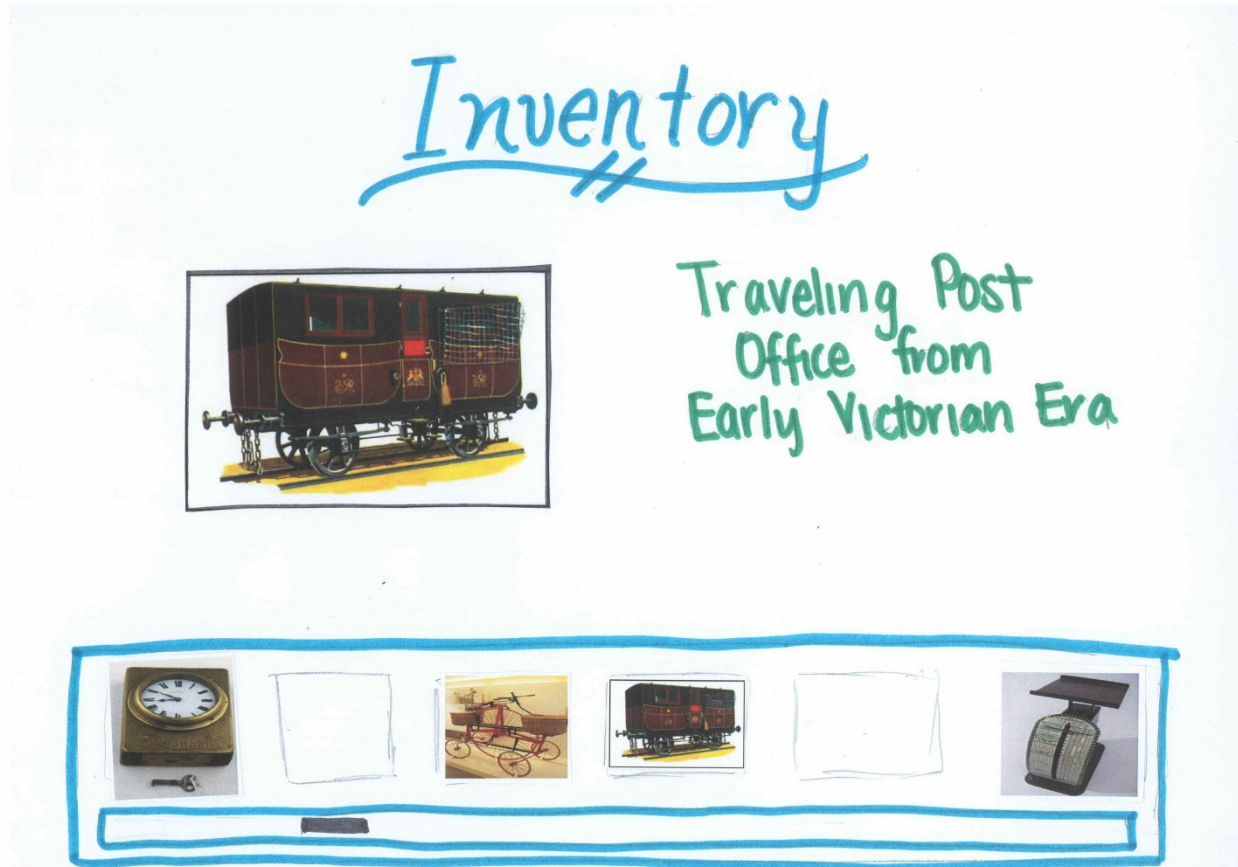


Figure 8 - Inventory

### Interviews at BPMA Open Days

To aid our design process, we utilized the BPMA's Open Days at the Museum Store to receive feedback on our prototype. The first of the open days was Family Fun Day, on March 31. The second was Mail Rail Open Day, on April 21.

### Family Fun Day: March 31, 2012

To determine how our target audience interacts with educational games, we interviewed parents with children in the Key Stage 2 age range at the BPMA's Family Fun Day on March 31, 2012. We asked the parents about the video games their children play, the educational components of these games, how the kids are introduced to these games, how parents are involved in the gameplay, and what platforms children use. We found that most of the children play games for both education and entertainment purposes. Parents appear to favor educational games; some parents only allowed their children to play educational games, while others allowed both educational and purely entertaining games. The children discover educational games with



the help of parents, teachers, and sometimes on their own. The majority plays these games both supervised and unsupervised. The platforms they typically use are computer, iPhone, iPad, and Wii. To view the interview questions, refer to Appendix F.

In addition to asking about their children's gaming habits, our group created a preliminary storyboard of our design. Using artistic sketches, we presented five of our mini-game ideas to the families we interviewed. We asked the parents whether or not their children would be interested in playing these games. We also asked if they consider the difficulty levels of our games to be adequate for their children. Overall, the feedback we received on our storyboards was positive. The parents approved of our designs, in terms of creativity, age-appropriate content, and educational material.

### [Mail Rail Open Day: April 21, 2012](#)

We utilized Mail Rain Open Day on April 21, 2012 to receive some final feedback on our prototype. Each interview started with a walk-through of one section of our game. The walk-through consisted of the reading of a script describing how the user would navigate through the game, supplemented by drawn storyboards to illustrate our idea. This was then followed by questions targeting specific aspects of our game. Our questions targeted the Game Map, Tibs the Cat, avatar creation, mini-game introduction screens, and the use of a digital Stamp Book and Inventory. To view the interview script and questions, refer to Appendix G.

Though there were not many families with children in our target age range present, we still were able to receive helpful feedback from the three groups we spoke with, all of whom had some form of interaction with children in our target age range. All three groups confirmed that our Game Map would be easy for children to navigate and generally was a clear display of a passage through time.

We asked about the inclusion of Tibs the Cat, as a guide through the game. We wondered if including Tibs would spark children's interest in the game, making him an appropriate "hook" for users. All three parties confirmed that children can relate to cats. We learned that a postman in a television show has a cat, and that children already relate cats to the postal service.

We received mostly positive feedback when we asked about the inclusion of an avatar in our game. One party wasn't sure if the inclusion of an avatar would enhance gameplay for children, while the two others felt that children can relate to and respond well to the presence of a virtual "me" in the game.

The introduction screen of a mini-game was presented to the groups. It featured a key figure from history with a speech bubble, explaining the historical context of the game. The groups liked the inclusion of the key figure, but thought the text could be presented in smaller paragraphs, and a simpler font.

Finally, we asked about the inclusion of the Stamp Book and Inventory. We wanted to know if these features would motivate children to continue the game or return to the museum. Our interviewed confirmed that children would be motivated to continue playing and return to the museum because of the inclusion of these features. It was recommended that the Stamp Book be introduced very early on in the game.

## Goal Completion

Our game design was guided by the goals we set out to achieve with this game. Some of these goals are accomplished by the different game components. Others are met through the content of the mini-games. As the project developed, we began to realize that some of the goals we set out to achieve will be more relevant when the BPMA hires a design contractor to implement this game. Therefore, these goals were not addressed by our design and have been left up to the design contractor's discretion. This section will go through how each design goal was addressed.

### 1. **Appropriate for a primary user in the 7-11 age range**

To make the navigation of the game age appropriate, we designed a Game Map interface that allows the user to easily navigate the game. The visual representation of time periods as islands facilitates the interaction between the user and the tool, thus helping to ensure that the navigation is adequate for the target audience (Murtagh 2003). Our design also includes a toolbar and buttons for moving between different screens, as can be seen in our storyboards (Appendix F). These buttons are intended to facilitate navigation between different sections of the game; however, the detailed design of the interface is left up to the design contractor.

The look and feel component of this goal will be left up to the contractor design team. It is important that this game follows the guidelines we established in Design Goal #1 – visual appeal, complementary audio, and a hook. However, since we are not

creating a working prototype of the game, these aspects must be addressed by the designers.

2. **Key Stage 2 Relevance w/ direct ties to Schemes of Work (National Curriculum)**

Each mini-game incorporates facts about postal history that can be tied into topics from the National Curriculum, including History, Arts and Crafts, and Geography. For more details, refer to the mini-game descriptions in the “Mini-games” chapter.

3. **Clear Communication of Educational Content**

To help convey the educational content to the user, our game incorporates two elements that facilitate the teaching process. One of these is the inclusion of an avatar. Each user creates a personal avatar that is involved in completing the mini-games. According to research, the user’s emotional investment into his avatar will help build a connection between the user and the gameplay, thus facilitating the learning process (King 2010). The other component that will ensure clarity is the inclusion of key figures from postal history. These figures will introduce mini-games by explaining their historical context and significance. After each mini-game, the key figure would summarize the user’s accomplishments in a historical context. These elements attempt to convey the historical significance of each game to the user; however, it will be up to the design contractors implementing the game to ensure that this material is clearly conveyed.

4. **Reward features**

The Stamp Book and Inventory provide rewards for the user. The blank slots in the Stamp Book and Inventory are meant to infect the user with the need to complete them. The user can be rewarded by completing a mini-game or visiting the museum. By allowing the user to receive awards for his efforts, “Mail Tales” attempts to provide the user with a sense of accomplishment, whether for completing a mini-game or for visiting the museum.

5. **Fluid storyline**

Each mini-game will have a key figure from postal history or a primary source document introducing and explaining the mini-game. This will ensure that the mini-games are linked via an interesting storyline. To make the transitions even smoother, Tibs the Cat will introduce the different time periods

## **6. Non-didactic, informal learning approach in terms of interaction between the program and the user**

To ensure that our game is not overly didactic and uses an informal learning approach, we designed the game to be very interactive for the user. During gameplay, there will be a lot of input required from the user, and the game will respond accordingly. The mini-games will be very interactive, as the user will be faced with different tasks that will require mouse, keyboard, or touch input, depending on the platform. In addition, user input will be required to navigate between mini-games and time periods. To further encourage an informal learning approach, the “Post Zone” game will allow the user to submit his input on the future of the postal service.

## **7. Adaptability**

The structure of our design is flexible enough to accommodate for nearly any possible future change in the New Centre. The game is divided into time periods, each corresponding to one of the exhibits. If the BPMA replaces one of their exhibits, the game’s structure will adjust accordingly; the section of the game linked to that exhibit, including the corresponding mini-games, will be removed from the game. A new game section, relevant to the new exhibit, will be created to replace the missing section.

The same concept applies to mini-games. If the BPMA does not like a particular mini-game, it can be removed and replaced by a different one. Similarly, mini-games can be added to an existing time period, provided that their content is relevant.

The storyline of the game also supports the goal of adaptability. The storyline in “Mail Tales” revolves around the time travels of the avatar created by the user; it is not dependent on existing exhibits. What happens in each time period does not affect the rest of the time periods; thus, in case an exhibit gets replaced, the storyline remains usable and will only need some minor adjustments.

## **8. Link between game and physical exhibit**

To accomplish this goal, our game structure and content were based on the time periods displayed in the new exhibit. The Game Map reflects the structure of the New Centre; each time period on the map corresponds to a future exhibit in the New Centre. Each exhibit in the New Centre will have a station with one of the mini-

games on it. In addition, the content of each mini-game is relevant to the exhibit it originated from. Artifacts from the BPMA's collection and stamps from the exhibits will be incorporated into the game as collectable inventory items and as part of the gameplay.

#### **9. Encourage game users to visit museum**

To encourage follow-up visits to the BPMA's New Centre, our design includes a rewards section that promotes visiting the museum. Visiting the museum will allow the user to collect various stamps and artifacts to add to their in-game collection, thus motivating them to visit the museum.

Another way we encourage future visits is through feedback from the user. One of the mini-games, "Post Zone," involves a comment section that asks for the user's feedback on the game and the exhibit in general. The game may ask questions about what they liked, what they did not like, and what suggestions the user has for the content in the exhibit. Users will be able to submit their ideas for new mini-games, new content for the exhibits, etc. This will likely spark the users' interest in visiting the museum again to see how their suggestions are addressed.

#### **10. Diminish stigma that postal history is a niche environment**

This design goal was accomplished via two aspects of the game. For one, the mini-games link postal history with cultural aspects relevant to the users' prior knowledge and personal experience. The mini-games try and relate aspects of postal history to areas of knowledge that the user is typically already familiar with, such as the Great Fire of London and television. In addition, peculiar pieces of postal history are used to spark curiosity in the user. These include Tibs the Cat, the use of cross-written letters, and the existence of mail on the Titanic, and other interesting information (refer to the Content Development section of the Design Chapter for a detailed list).

## Suggestions for Implementation

### Design

There were several design goals that our group was unable to adequately address during our time on site. These components were the visual appeal (graphics), complementary audio (sound), and the 'hook' of the game (complex story). The importance of each of these elements

is shown in the study performed by Daniel King. In this study, each of these elements ranked in the top 15 in all three categories (enjoyment, perceived importance, and behavioral impact) of gameplay (King 2010). Due to the effect these components can have on our game, it will be necessary to further study them once the design process begins.

Although our group does not have the expertise to properly address these design goals, we have a general concept of how these goals should be worked into the design. The graphics should be vivid and engaging towards the target audience. Our group has envisioned very simple sound effects during game-play with the option to mute all game sounds. The 'hook' of the game should be Tibs, the postal service cat. Tibs would provide a constant focal point for the game, presenting engaging plot lines where necessary. He would also introduce new areas of history and guide users through games.

### In-Museum Implementation

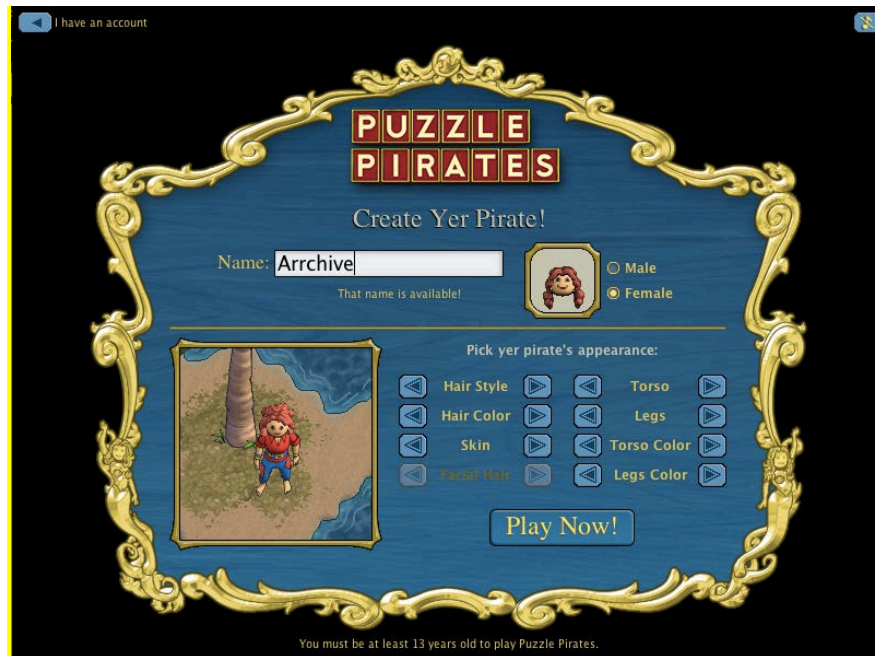
According to the Creative Design brief provided by our sponsor, the museum will have permanent exhibits focused on the five time periods presented in our game . Each of these exhibits should contain at least one station where visitors can play a demo version of our game. This demo will present the user with a view of the entire game map, but will only allow for one game to be played in each time period. This setup will encourage the user to continue playing the game at home. These stations will also provide an option to create a generic avatar connected to an account that the visitor uses at the play stations throughout the museum. This account would contain all of the progress that the user attains during his museum visit. This progress can be continued at home by accessing the account online. From home, the user will have access to all of the games, including those that were unavailable at the museum, as well as full customization of their avatar.

### Online Implementation

Alternatively, the user can choose to open an account online without having visited the museum. This option will bypass the demo process that is present at the museum and allow the user to access the full game. Users will have immediate access to the full avatar creation screen.

## Avatar Creation

The full avatar creation screen will contain basic preset options in a few appearance categories. This is very similar to what can be found in online RPGs already in use, such as Puzzle Pirates, shown in Figure 5 below.



**Figure 9 - Puzzle Pirates' Avatar Creation Screen (www.puzzlepirates.com)**

As can be seen from Figure 5 the user can scroll through the options that are available in areas such as gender, hair style, hair color, and skin tone. The user should also have simple options of articles of clothing for their avatar, such as the 'legs' and 'torso' options offered by Puzzle Pirates. This customization is limited by the number of options that the game designers have included. This setup allows for a wide degree of creativity, but not so much that someone will focus on the avatar creation and not the actual game.

The customization of a player's avatar does not end after they leave the creation screen. Throughout the game, players are able to unlock and earn new clothing items for their avatar. Players will also be able to do this by visiting the museum again and collecting codes near relevant clothing to obtain them in the game. The method in which this is done will be up to the full design team, but our group has foreseen this done through entering codes into game to receive the special items.

## Introduction to Rewards

Within our game design, there are two types of rewards that a player may receive: stamps and inventory items. As described earlier, certain stamps and historical artifacts can be obtained by visiting the museum. This idea could be implemented in several different ways. One way to incorporate these special edition items into the physical exhibit is through the use of codes. The museum exhibit would have codes for different stamps or items posted around the exhibit. The user would visit the museum, obtain the codes, and enter the codes online to unlock the items. An alternative method would be to collect the items using the user account. When visiting the museum, the user would have the option of logging into his account and adding the items directly to their accounts' inventory or stamp book.

## Game Map

The game map is the key navigational component of our game. From here the user can access all the time periods in the game and select which games he would like to play. To create the easiest navigation possible our map contains multiple 'islands,' each representing a time period within the game. Tibs will be present at this point to help guide the user through this screen to avoid confusion. After choosing a time period, this 'island' will become the sole focus of the screen revealing the mini-game options within that time period. As the user selects each of these options, descriptions of each game are presented on the screen with the option to play or return to the map of the island. This organization will allow the user to know what types of games are offered before committing to playing. It also provides a very logical progression from broad choice of time period to the specific choice of game options.

## Platform Recommendations

### *Museum Platform Options*

Through our archival research and evaluations, we discovered the use of three different game platform options that can be used in museums. These options include a computer and mouse setup, touchscreens, and physical-digital combination, shown in Figures 6, 7, and 8 respectively.

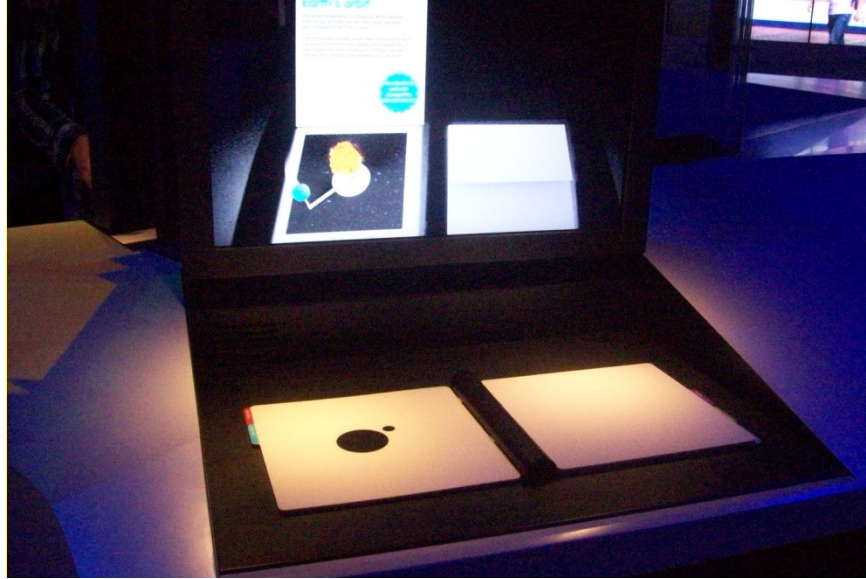




Figure 10 - Computer and Mouse Platform (photo taken by Cassiopia Hudson)



Figure 11 - Touchscreen Platform (photo taken by Cassiopia Hudson)



**Figure 12 - Physical-Digital Combination Platform (photo taken by Cassiopia Hudson)**

Each of these options presents benefits and downfalls to implementation. The computer and mouse option have problems with interactivity and visual appeal. During our evaluations, this option scored the lowest in these two categories. Refer to Figure 9 for detailed comparisons. According to Alison Bean, there is a movement away from this type of platform in museums. This was confirmed by another e-learning expert, Rhiannon Loosely, and through research conducted by Chang-Su Kim (Oh, Yang, Kim 2009). There is a lower cost of maintenance for desktop computers as opposed to physical-digital combination and touchscreens. Computer and mouse platforms also have the lowest initial costs, but not by much. As can be seen in Figure 9, the average of the low end desktops are only £55 cheaper than the average of all of the tablet options shown in Figure 10.

<b>Desktop Computer Prices</b>	
Dell	£230
HP	£279
Sony	£829
iMac	£999
Average with High Ends	£584.25
Average without High Ends	£254.5

**Figure 13 - Desktop Computer Prices**

<b>Tablet Prices</b>	
Sony	£299
iPad	£329
Samsung	£300
Average	£309.33

**Figure 14 - Tablet Prices**

Touchscreens scored the highest in interactivity. They also had generally higher scores in communication of educational content and navigation. There is a high maintenance cost associated with these devices, but with the limited number needed by the BPMA this cost may prove negligible. The average low end tablets cost about £55 more than the average low-end desktop computer bundles. According to the e-learning experts we interviewed, as well as our sponsors, there is a movement towards the use of touchscreens in museums.

The physical-digital combination is the final platform and scored highest on visual appeal. As our group tried to test out these devices we found that they were always surrounded by children, a testament to their effectiveness. Our group ran into a problem with this platform due to the general size of each game. The BPMA's New Centre, although larger, will not have the space required to fit multiple game stations of this platform and still have room for the exhibits.

### *Personal Use Platform Options*

Through our conversations with families, interviews with e-learning experts, and literature review, we discovered that desktop computers are prevalent in homes. Our family interviews showed that there are many teachers that assign homework as online games to be played on a computer. Computers have a far greater prevalence outside of the museum environment at about five times the number of users as mobile devices (King 2010). Thus, it would be prudent to implement this game online so that children with access to a desktop computer could play it.

Aside from personal computers, our family interviews showed that a number of children have access to touchscreen mobile devices, such as smartphones and tablets. This would support the idea of turning this game into an app that would run on tablets, smartphones, or both. Our interviews with Erin DeSilva and Rhiannon Looseley revealed that developing a game for a

touchscreen is very different from developing a web-based game. Furthermore, there is a significant difference between a large touchscreen and a small smartphone touchscreen; these require different development approaches due to the difference in screen size. During our surveys of families, we discovered that more families owned a smartphone than a tablet device. Therefore, it may be easier to focus on making the game available on one of these types of platforms. However, it is imperative that the game is made available to play on a regular desktop computer, as it was found that only 12.6% of video game players use their mobile device for the purposes of playing video games (King 2010). Depending on the budget and other development considerations, the design team may decide to rule out one or both of these options.

### Recommended Platform

Our group determined that the use of both desktop computers and touchscreen tablets would be the best option for the BPMA. The cost and size of the physical-digital combination outweighed the benefits that it could bring. We recommend that since it is easier to develop an application for a tablet and a desktop computer, due to similar screen size, the BPMA should focus on implementing tablets in the museum exhibit, and a web app for personal use. The desktop and tablet combination would allow for the immediate widespread distribution of the game due to the prevalence of personal computers. As a future goal, we envision “Mail Tales” on touchscreen computers in the BPMA’s New Centre, and a mobile version of the game for personal use.

## Mini-Games

### Early Days of the Royal Mail (1635 – 1837)

#### Great Fire of London

##### *Introduction:*

James Hickes introduces the game. He describes the Great Fire of London in 1666. He also explains that he worked with a team to save as many mail/paper records as possible (Campbell-Smith, Duncan 2011).

##### *Gameplay:*

User is inside a burning post office during the Great Fire of 1666. The objective is to find letters in cabinets and save them from the fire. The user is placed in the mailroom office, surrounded by desks, cabinets, etc. The user will click on different drawers and cabinets to open them, and click on letters to find them. The post office slowly catches on fire, timing the users. When the post office is fully on fire, the game is over. Refer to Appendix H-4 for the storyboard for this game.

##### *Conclusion:*

James Hickes congratulates the user for completing the game, and tells them how many letters they managed to save from the fire. He gives the user the following stamp for their Stamp Book:



Figure 15 - Great Fire of London Stamp (<http://coins.delcampe.co.uk/page/item/id.0104033908,language.E.html>)

### *Education:*

Relevance to National Curriculum (History Unit 5, Section 4): Great Fire is a big part of the Key Stage 2 curriculum. Teachers explain to children why the Great Fire happened and its consequences. Children are also taught the different ways the Great Fire (Unit 5) is represented. Section 4 of the Great Fire unit deals with how we know what happened in the great fire. Our game revolves around the idea of records and how a lot of the letters that could not be saved from the fire were lost forever. Students will learn that if they do not save letters, the letters and the information they contain will be lost.

Historical significance: This game is based on the story of James Hicke, a postal worker who stayed behind in a post office to save as many letters as possible during the Great Fire.

### *Handle with Care*

#### *Introduction:*

Moses James Nobbs (maybe - lived 1836-1891) introduces the user to the game, with a description of his job as a mail coach guard (British Postal Museum & Archive: Case Study 2: Moses James Nobbs, mail coach guard, 2009).

#### *Gameplay:*

User becomes a mail coach guard from the 1700's. These guards were required to complete their mail runs in a certain amount of time, and the user will be required to do the same. The user will navigate a winding road by guiding a mail coach along a path, avoiding obstacles that could reduce their time. The user controls the direction of the mail coach with left and right arrows to help the mail coach avoid oncoming obstacles. Refer to Appendix H-5 for the storyboard for this game.

#### *Conclusion:*

Moses James Nobbs congratulates the user for completing the game, and presents them with the following stamp:



**Figure 16 - Handle With Care Stamp** (<http://www.paintersdecoratorsin-melksham.co.uk/construction-news/day-the-mail-was-held-up-by-a-lion-newly-discovered-painting-records-little/>)

Moses Nobbs also presents the user with the intamperable timepiece for their inventory:



**Figure 17 - Handle with Care Inventory** ([http://coachhorntoolers.com/images/140\\_royal\\_mail\\_guards\\_time\\_piece.jpg](http://coachhorntoolers.com/images/140_royal_mail_guards_time_piece.jpg))

*Education:*

National Curriculum: No direct links, but very important part of postal history.

Historical Significance: Posting letters by mail coach was a very common form of communication in the early days of the Post Office, and it is important to highlight this.

Link to artifact: The timepiece that the user is racing against is an actual artifact from the BPMA exhibit, and fulfills the BPMA's wish to have real objects in their e-learning program. From there, Tibs can prompt students to find the intamperable timepiece in the exhibit.

## Cross-written Catastrophe

### *Introduction:*

Charles Darwin introduces the user to the game. He explains that he used cross-written letters (Cambridge University Library).

### *Gameplay:*

The user will be required to decode a cross-written letter. Cross written letters were common before the introduction of penny post, when prices were based on the number of sheets of paper being mailed. To avoid high costs, people wrote in multiple directions on their letters. The user is presented with a cross-written letter than he can rotate and zoom in on. He must type in what the letter says in the space next to it. Refer to Appendix H-6 for the storyboard for this game.

### *Conclusion:*

Charles Darwin congratulates the user for completing the game, and presents them with the following stamp (adapted from image):



**Figure 18 - Cross-Written Catastrophe Stamp** ([www.postalheritage.org.uk/page/3304/Ironbridge--Before-the-Penny-Post+crosswritten+letters+uk&hl=en&gl=uk&pid=bl&srcid=ADGEESjm80c1EILJJkiBxrsLPpIom4yj62972rAaI2r-W\\_C8wo](http://www.postalheritage.org.uk/page/3304/Ironbridge--Before-the-Penny-Post+crosswritten+letters+uk&hl=en&gl=uk&pid=bl&srcid=ADGEESjm80c1EILJJkiBxrsLPpIom4yj62972rAaI2r-W_C8wo))

### *Education*

Key Stage 2 ITC Unit 1C: students “learn information exists in a variety of forms, including text, still and moving pictures, charts and sounds and that different media are used for different purposes.” Here, students interact with a picture of a letter, and need to interpret the text in the image.



Historical significance: This game will bring to light the difficulties of early communication by post, as well as the content of the letter.

## Victorian Postal Reform and Innovation (1837 – 1914)

### Traveling Post Office

#### *Introduction:*

Frederick Karstadt introduces the user to the game. He explains how he suggested the implementation of trains as Traveling Post Offices (Buckingham Covers - 40th Anniversary of the Last TPO Exchange).

#### *Gameplay:*

The user's avatar is put on a train station between two moving postal trains (TPO's). There are large bags of mail hanging off the sides of the train, and the user is tasked with directing his avatar to catch as many mail bags as he can. From the avatar's vantage point on the platform, trains zoom by on either side. The user must click on the mailbags to direct his avatar to catch as many as he can. Refer to Appendix H-9 for the storyboard for this game.

#### *Conclusion:*

Frederick Karstadt congratulates the user for completing the game, and presents them with the following stamp:



**Figure 19 - Traveling Post Office Stamp** (<http://postalheritage.org.uk/page/victorian-rail>)

Frederick Karstadt also presents the user with a Victorian Traveling Post Office for their inventory:



**Figure 20 - Traveling Post Office Inventory** (<http://www.spartacus.schoolnet.co.uk/RAgrandJ.jpg>)

*Education:*

Relevance to National Curriculum History Unit 12 Section 3: students learn how life changed in their locality during the Victorian Era. This game will cover how the expansion of railways changed the lives of England's population. This game, particularly in comparison with *Handle With Care*, teaches how communication was becoming faster.

Historical significance: This game highlights the importance of the Traveling Post Office in terms of communication speeds increasing.

### Build Your Own Stamp!

*Introduction:*

Rowland Hill introduces the user to the game. He explains that he introduced the idea of uniform penny postage and the Penny Black stamp.

*Gameplay:*

During this game, users will be allowed to create their own stamps. They will learn how early stamps were created. Users are presented with a blank stamp and a set of shapes and colors. They can drag and drop the shapes (basketball, football, flower, car, toy, etc.) onto the stamp, and use the color swatches to color in the shapes (think Microsoft Paint). They will also have a selection of letters, numbers, and symbols to put on the stamp (ex. 1p, 50p, etc.). Two examples of stamps will be shown to the user, to help spark creativity. These stamps can be pieces that the BPMA would like to highlight in their collection – the original Penny Black and Scotland winning the World Cup stamps are our suggestions. Refer to Appendix H-11 for the storyboard for this game.

### *Conclusion:*

Rowland Hill tells the user the stamp they created looks great. He presents the user with the original Penny Black stamp for their Stamp Book, and allows the user to save the stamp they just created to their Stamp Book as well.



**Figure 21 - Build Your Own Stamp! Stamp** ([http://postalheritage.org.uk/uploads/Penny\\_Black\\_Vol\\_III\\_pg\\_008\\_0.jpg](http://postalheritage.org.uk/uploads/Penny_Black_Vol_III_pg_008_0.jpg))

### *Education:*

Relevance to National Curriculum - Art and Design Units 3B (Investigating Patterns) & 5A (Objects and Meanings): The user will be able to organize and combining shapes to create their own design (3B) that allows them to convey their own ideas and feelings through their own personal stamp (5A).

Addresses “stigma” design goal: children learn that the postal service is culturally aware.

Historical significance: User will learn of the rules required of early stamp creation, and of some interesting stamps that were created.

## **Save the Mail!**

### *Introduction*

Oscar Woody introduces the user to the game. He explains that the Titanic carried Royal Mail, and that saving letters was very important as his job was postmaster of the Titanic (Mail Online: As the band played on, Titanic postmen tried to save the mail, 2007).

### *Gameplay:*

The user is inside the post office on the Titanic during the tragic sinking of the ship. The objective is to save the important letters in the office from the rising water. This will be a puzzle game similar to “Bubble Explode” where rather than colored bubbles, users need to click on

groups of letters among other post office supplies, like pens, ink, and black stationary. Refer to Appendix H-12 for the storyboard for this game.

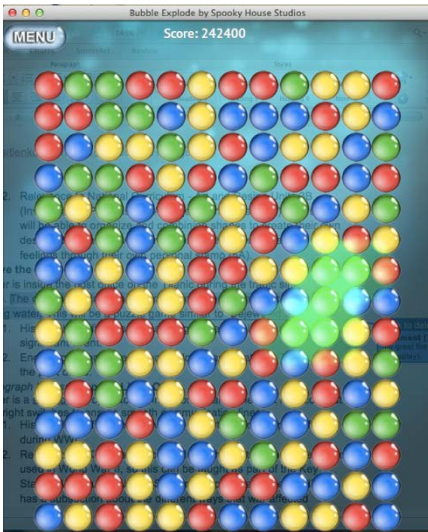


Figure 22 - Bubble Explode (before)

(<http://www.spookyhousestudios.com/bubbleexplode.html>)

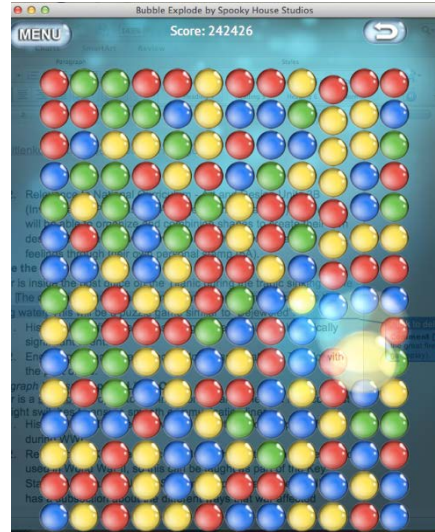


Figure 233 - Bubble Explode (after)

*Conclusion:*

Oscar Woody congratulates the user for saving mail on the Titanic. He presents users with the following stamp:

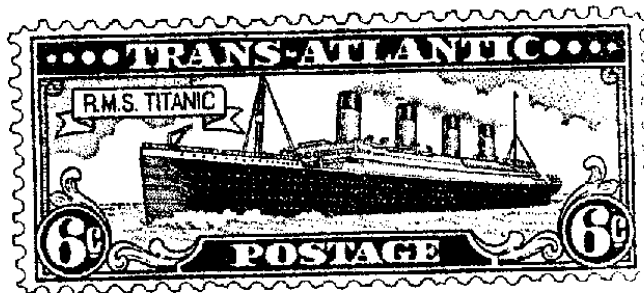


Figure 24 - Save the Mail! Stamp (<http://bjrubberstamps.com/Postage2.gif>)

*Education:*

National Curriculum: The sinking of the Titanic is not mentioned in the National Curriculum, but we feel that it is an important event from history.

Historical significance: the sinking of the Titanic is a historically significant event that involves the Post Office. This fulfills our design goal of making postal history a more relevant, relatable topic, making postal history less of a niche subject.

## The Post Office in Wartime (1914 – 1918, 1939 – 1945)

### Keep the Lines Open

#### *Introduction:*

Tibs introduces the user to this game. He explains that the Post Office was responsible for handling communications during wartime, and that over 11,000 Post Office engineers worked to set up telegraph and telephone lines between the front lines and headquarters (The British Postal Museum & Archive: Front line communications, 2009).

#### *Gameplay:*

The user is a switchboard operator during World War I, trying to ensure smooth communication lines. The user is presented with a switchboard and some colored wires. The task is to connect the colored wire to the switches that light up of that same color. The user will click on the wire and drag it to the correct switch. This may involve dragging the wire with the mouse (aka holding down the mouse button) or simply clicking on the wire and the switch. Refer to Appendix H-13 for the storyboard for this game.

#### *Conclusion:*

Tibs congratulates the user for keeping communication running smoothly, and presents the user with the following stamp:



**Figure 255 - Keep the Lines Open Stamp** (<http://distantwriting.co.uk/images/ETC%20Stamp%2002.jpg>)

#### *Education:*

Relevance to Key Stage 2 (Unit 9, Section 6): Switchboards were used in both World Wars, so this can be taught as part of the Key Stage 2 WWII unit. Specifically, the WWII unit has a subsection about the different ways that war affected people. This game should illustrate how communication worked in the war, and its connection to the Post Office.

Historical significance: This game shows the importance and involvement of the post office during WWI. This fulfills our design goal of making postal history a more relevant, relatable topic, making postal history less of a niche subject.

#### **Find the Pillarboxes**

##### *Introduction:*

Frederick Gurr introduces the user to the game. He explains that he worked on a team to keep mail delivery running smoothly. The goal of the Post Office was to have no more than 48-hour delays (British Post Museum & Archive: Dodging Bombs to Move the Mail, 2009).

##### *Gameplay:*

The user will become a member of Frederick Gurr's mail salvage team. This group collected mail from pillarboxes that were bombed or covered with debris. The user can pan through a street scene that has obviously been destroyed by a bombing. They must find as many pillar boxes in the debris (by clicking on the pillar boxes they find) before the time is up and the next bombing is going to happen. Refer to Appendix H-14 for the storyboard for this game.

*Conclusion:*

Frederick Gurr congratulates the user for finding the pillar boxes and keeping the mail on schedule, and presents the user with the following stamp (adapted from an image):



**Figure 26 - Find the Pillar Boxes Stamp** (<http://postalheritage.files.wordpress.com/2011/05/0212-delayedbyenemyaction.jpg?w=250&h=177>)

*Education:*

Relevance to Key Stage 2 - WWII is a large part of the curriculum. Unit 9, Section 6 of the Key Stage 2 History Curriculum is about how the war affected daily life. Students should learn about how the war affected daily life and communication.

Historical significance - the user will learn about a recent significant period as well as the hardships faced by London residents during the London Bombings

## Dire Decoding

*Introduction:*

Users are introduced to the game by Tommy Flowers. He worked for the Post Office to help decode enemy communications during WWII (BBC News: Bletchley's code-cracking Colossus, 2012; British Postal Museum & Archive: Engineers & Cracking Codes, 2012).

*Gameplay:*

The user will take on the role of a code cracker during WWII who had ties to the postal service. These code breakers would use stolen German coding a machine called Enigma. In our game the user will be trying to break a number of keywords to find a message. As words are guessed correct letters will be shown and the results of the letters will be given to the user. These results are given in a color code indicating three possible outcomes: correct letter in the correct place, correct letter in the wrong place, and wrong letter. Refer to Appendix H-15 for the storyboard for this game.

*Conclusion:*

Tommy Flowers congratulates the user for helping decode enemy communications and presents them with an Enigma Code Machine stamp shown below.



**Figure 277 - Dire Decoding Stamp** ([http://images.businessweek.com/ss/06/05/stamps/image/c\\_turing.jpg](http://images.businessweek.com/ss/06/05/stamps/image/c_turing.jpg))

*Education:*

Key Stage 2 History Curriculum Unit 9, Section 6 is about how the war affected daily life. This game teaches about one of the occupations people were involved in during WWII.

Historical significance: Students learn about the importance of decoding enemy communications, and how it is relevant to postal history.

## Golden Age of the GPO [General Post Office] (1930s to 1960s)

### Deliver that Letter!

*Introduction:*

John Vickers worked as a telegram boy. Excerpts can be taken from his story to introduce the game to users (Vickers, John 2005). These excerpts can include his decision to become a Telegram Boy, how much he was paid per week, descriptions of his uniforms, the hours he worked, or other information that would illustrate what life was like for a Telegraph Boy.

*Gameplay:*

The user will take on the role of a messenger/telegram boy in the 1930's. The objective is to navigate through a maze (representing the streets of London) to deliver a letter/package from point A to point B. The user is shown a map and needs to trace the best route from his current location to a given destination. Refer to Appendix H-16 for the storyboard for this game.

*Conclusion:*

John Vickers presents the user with a telegram boy stamp (adapted from an image):





Figure 288 - Deliver that Letter! Stamp (<http://postalheritage.org.uk/uploads/IRP022.jpg>)

Inventory:



Figure 299 - Deliver that Letter! Inventory (<http://postalheritage.org.uk/page/pedalcycles>)

*Education:*

Relevance to Key Stage 2: Geography Unit 18, General - Connecting ourselves to the world: students learn about their local area. Students learn how to navigate through a map. Geography, Unit 18, Section 4 - Where is a place? How will we get there?: students also learn “how their locality is set within a wider geographical context.”

Historical significance: Telegraph boys held prestigious positions in the post office. This allows students to learn what life would have been like for them during the Golden Age of the GPO, since this is a job that children would start in, and make a career of.

**Calculate the Cost!**

*Introduction:*

Claude Kirby, who worked as a Post Office Sorting Clerk, introduces the user to the game (Harper, Emma 2011).

*Gameplay:*

The user will take on the role of a clerk at a post office. The task is to weigh letters, determine their postage, and performing simple mathematical operations (British Postal Museum & Archive: Internal Postage & Parcel Rates, 2009). Refer to Appendix H-17 for the storyboard for this game.

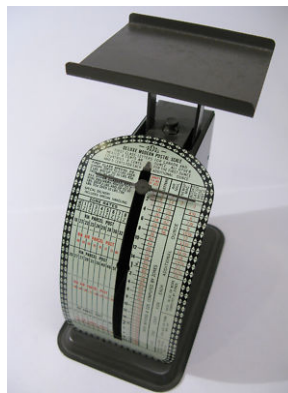
*Conclusion:*

Claude Kirby congratulates the user for completing the game, and gives them the following stamp (adapted from an image):



**Figure 30 - Calculate the Cost! Stamp** (<http://postalheritage.org.uk/page/counters-scales>)

He also gives the user a mail scale for their inventory:



**Figure 31 - Calculate the Cost! Inventory** (<http://www.shopping-advice.com/images/product-02204624768.jpg>)

*Education:*

National Curriculum: simple arithmetic (addition/subtraction, greater than/less than, units of measurement, simple word problems, etc. - Year 3 Block A)

Historical significance: This game illustrates what happened to packages and letters once they made it to the post office. It should give students insight to the work the Post Office does.

## Mail Across the Map

### *Introduction:*

Tibs or a Pilot introduces the user to Mail Across the Map with information about the first airgraph message, sent from Buckingham Palace (British Postal Museum & Archive: Copy of first Airgraph message, 2009; British Postal Museum & Archive: Pilots & Planes, 2009).

### *Gameplay:*

Users are presented with a simple world map, with each continent labeled. Users are told they work at the Foreign Post Office, and they must figure out where letters are going. As this game increases in difficulty, questions about where the letter they are presented with is going get more difficult, and narrow down from a world map with simple questions about continents to questions about European countries. The game presents the user with a labeled map, and a letter. The user must drag and drop the letter to its destination. Refer to Appendix H-18 for the storyboard for this game.

### *Conclusion:*

Tibs or a Pilot congratulates the user for completing the game and presents them with a stamp (adapted from an image):



Figure 32 - Mail Across the Map Stamp (<http://postalheritage.wordpress.com/tag/airmail/>)

*Education:*

National Curriculum Unit 18, General: Connecting ourselves to the world: students learn about world geography, and how to locate other countries.

Historical significance: Sending post by airplane changed the speed of communication drastically.

## The Changing Post Office (1970s – today)

### Post with Poco

*Introduction:*

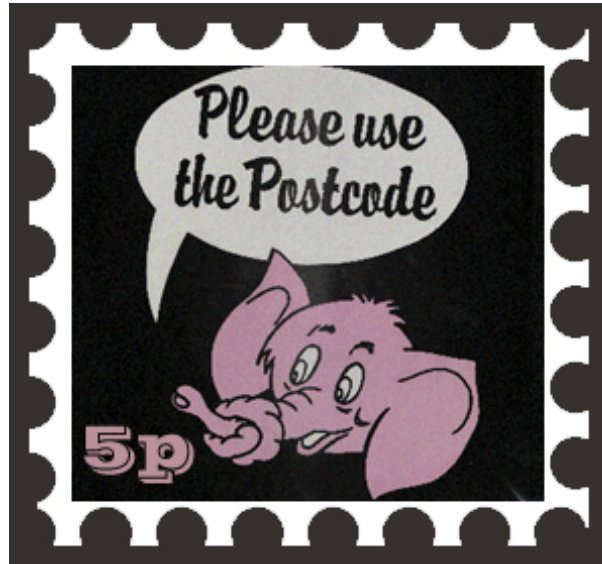
Poco, who first introduced the post districts of London, introduces the user to the game (British Postal Museum & Archive: Postcodes, 2009).

*Gameplay:*

In this game, the user is presented with a simple map of London and a postcode for a location in London. They are instructed to drag and drop an image of Poco the Elephant (a pink elephant used in the 1980's to advertise postcodes) to where they think the postcode is. Simple instructions will be given on how to understand postcodes. Users are presented with a map of London, and told to drag and drop Poco the Elephant's head to the location on the map where they think a given postcode is located. Refer to Appendix H-19 for the storyboard for this game.

*Conclusion:*

Poco congratulates the user for completing the game and presents them with a stamp and inventory item (adapted from an image):



**Figure 333 - Post with POCO Stamp** (<http://postalheritage.wordpress.com/tag/poco-the-elephant/>)

Inventory item:



**Figure 344 - Post with POCO Inventory** (<http://postalheritage.org.uk/page/maps-districts>)

*Education:*

Key Stage 2, Geography Unit 18: Students learn about how to navigate through their communities & local area. In Unit 18, Section 4, students also learn “how their locality is set within a wider geographical context.” This game teaches cardinal directions and their application in the origin of London postcodes.

Historical significance: Users learn about the origin of London postcodes and their importance in delivering letters.

## Without a License

### *Introduction:*

Tibs introduces that TV licenses were implemented by the Post Office to fund BBC television. Tibs explains that to check if everyone had a properly licensed television, TV detector vans were utilized (Karlsson, Jenny 2009).

### *Gameplay:*

The user is presented with a top-down view of a grid map of the streets of London. He will be controlling a TV Detector Van, finding houses with TV that don't have a TV license. The van will emit a radar signal that determines which house has a TV, and the user has to find all of them. The user can indicate where he wants the van to go by dragging it along the map. As the van drives, houses with illegal TVs light up red, and the user must click on every red house in the scene. Refer to Appendix H-20 for the storyboard for this game.

### *Conclusion:*

Tibs congratulates the user for completing the game and presents the user with the following stamp (adapted from an image):



Figure 355 - Without a License Stamp (<http://postalheritage.wordpress.com/tag/television/>)

### *Education:*

Relevance to Key Stage 2: The content of this game relates to the changes in Britain after World War II, including changes in culture. This game relates the Post Office to television, an

aspect of popular culture that the users interact with more frequently than the Post Office itself (Unit 13).

Addresses stigma design goal: This mini-game links the postal service to television, which children are more likely to relate to.

Historical significance: This game shows how the Post Office has changed post-1960s.

## Comments

### *Introduction:*

Tibs asks the user to aid the BPMA by providing feedback.

### *Gameplay:*

The last mini-game is a comment box where users can input what they think will happen to the Post Office and Royal Mail in the future. Tibs prompts users by asking other questions to get them thinking about how often they receive letters, what parcels they receive in the mail, and how they communicate with their friends and family. Refer to Appendix H-21 for the storyboard for this game.

### *Conclusion:*

Tibs gives the user the following stamp, or another modern stamp, relevant to recent world events.



**Figure 366 - Comments Stamp** (<http://www.london2012olympicsmedaltally.com/wp-content/uploads/2011/12/london-2012-olympics-stamps.jpg>)

### *Education:*

In the National Curriculum for Geography, (Unit 18, Section 3) it covers questions about “what e-mail is, why people use it and how it differs from posting a letter.” Also, in ICT Unit 3,

students learn about “communicating over distances” and “consider and compare different methods of communication.”

This is significant because it makes users think about the future, and provides the BPMA with interesting input. The comments, once filtered, can be displayed for all visitors to view.



## Conclusion and Recommendations

Based on our museum research, we recommend that the BPMA incorporate a touchscreen interactive into the future exhibit. As part of our background research, we visited a number of London museums, including the London Science Museum, London Transport Museum, Museum of London, Bank of England Museum, and the Grant Museum. All of these museums had some kind of touchscreen interactive, ranging from sophisticated games to tablets that allow users to make Twitter posts. These museum visits, as well as our interviews with e-learning experts, suggest that touchscreen technology is becoming a necessary component of museum exhibits.

For a more immersive experience, we suggest that this interactive be placed in a station that represents an artifact from the BPMA's collection, such as a telephone booth, a pillarbox, or one of the vehicles. The space in the New Centre will be an important factor in determining the most efficient way to implement this station. The Museum of London has a train driving game with two setups – one includes a model train hub around the game platform, and one does not. We found that the game was much more immersive when played inside a station that is relevant to the exhibit. If the space requirements allow for this setup, we would recommend placing the platform with the e-learning tool in such a station.

Through archival research and evaluations of e-learning tools at multiple museums, our group determined that, for the purposes of the BPMA, games are the most effective e-learning tool. Given that the target audience is children ages 7-11, a game is the most appropriate way to present educational material. Our evaluations showed that games in other London museums communicate educational material almost as effectively as text-based interactives. Games are also much more engaging in terms of visual appeal and interactivity. Overall, we recommend that the BPMA incorporate a game into the New Centre.

Our game, titled "Mail Tales," aims to satisfy the needs of the BPMA and the target audience by presenting postal history in an engaging, interactive manner. The game is designed to be visually appealing and easy to navigate, so that children ages 7 to 11 would find it engaging. "Mail Tales" is built around a series of mini-games, each of which presents a nugget of postal history. The content of these mini-games was chosen by cross-referencing postal history with the Key Stage 2 section of the National Curriculum. This material would appeal to teachers looking to supplement their classroom material with a visit to the New Centre. This

would also appeal to parents who, according to our interviews with families, encourage their kids to play games that have an educational component. To link our game to the future physical exhibit, the content and structure of “Mail Tales” are based on plans for structuring the New Centre, as presented in Creative Research’s brief. The game is divided into several sections, each corresponding with a section of the future exhibit. This structure can be easily adapted to future changes in the exhibit; if an exhibit section is replaced, the corresponding game section can be removed and replaced with content relevant to the new section. Mini-games can be added or removed at the discretion of the content managers. The content of the mini-games attempts to engage the user with interesting facts about postal history. In addition, the game’s reward features are designed to entice the user to visit the museum in order to collect special edition stamps and inventory items.

Due to the interactive nature of “Mail Tales,” as well as its close link to the future exhibit, we concluded that this game should be an integral part of the New Centre. Some of the more established museums in London, such as the Science Museum and the Museum of London, have a number of interactives that draw in visitors on a regular basis. To bring the BPMA up to par with such museums, we recommend that the BPMA invests in a high level interactive. “Mail Tales” is designed to draw in families with children as well as school groups, thus expanding the audience base of the museum. If implemented, this game has the potential to become the highlight of the museum that keeps visitors coming back and attracts new audiences.

The BPMA is in a prime situation for incorporating an interactive tool like this because the New Centre is still under design. In our interview with Rhiannon Looseley, the Online Learning Manager at the Museum of London, we learned that interactives should be implemented in tandem with the exhibit that they will be used in. This makes the interactive much more immersive and integral to the exhibit. Being in the process of designing the physical exhibit allows the BPMA to seamlessly incorporate an interactive into the exhibit as it is being constructed.

Implementing “Mail Tales” both in-museum and online would provide visitors with an interactive visit to the museum and, potentially, an engaging post-visit experience.. Visitors to the New Centre would play the different parts of the game as they walk around the different exhibit sections. They would be able to save their game progress using an account, and continue this progress in the online version from their homes. Making the game available online would

potentially keep the users playing “Mail Tales” for an extended period of time, as opposed to a one-time play-through in the museum. Playing the game online could potentially keep the museum fresher in people’s minds. The reward features in the game, stamps and inventory items, may also encourage players to revisit the museum exhibit to collect special edition items.

We also recommend the use of numeric or QR codes to facilitate account creation and use. Upon entering the museum, users could receive a code on their entry ticket that would allow them to save in-game progress. An example of the use of codes on tickets in museums is The British Music Experience. Rhiannon Looseley at the Museum of London recommended we look into their system, where museum visitors can store information on their entry ticket and bring that information home. This would save users from having to create an account via a username or e-mail address, both of which may be difficult given the age of the target audience. The use of QR codes would be beneficial to the BPMA because museum technology is trending towards the use of mobile technology. This would bring the New Centre up to par with other London museums. These numeric or QR codes could be used to implement special edition rewards in the museum. For example, a special edition stamp could be placed in an exhibit along with a code; the user would then have to scan a QR code with a smartphone or enter a numeric code online to receive that stamp. The same idea can be applied to artifacts in the exhibit.

While our group designed the structure and much of the content of “Mail Tales,” many of decisions on gameplay and interface have been left up to the future developers. However, we have several suggestions for gameplay features. The mini-games in “Mail Tales” should be replayable, with an option to skip the introduction and conclusion screens available for subsequent play-throughs. In addition, mini-games could have different levels of difficulty. Players can be rewarded for completing the game at various difficulty levels, providing more incentives for them to play the game. This would also make the difficulty of each mini-game more flexible, providing more challenging gameplay for older users while allowing the younger users to complete the game as well. Moreover, the mini-game content developed in this project may need some modifications. For example, the ‘Handle with Care’ mini-game may fit better in the Victorian Era time period, because Moses James Nobbs worked as a mail coach guard in the Victorian Era. In ‘Cross-written Catastrophe,’ the content of the cross-written letter could be a primary source document, such as one of Charles Darwin’s letters. Alternatively, it could be an original story or anecdote. We suggest that the ‘Build Your Own Stamp’ game, if implemented,

should have a print option that allows the user to print the stamp he created. This would require a printer setup in the museum. Finally, we suggest that the auditory elements of “Mail Tales” be in form of non-disruptive game sound effects. We also suggest that in some cases, Tibs the Cat’s instructions be read aloud. Overall, the auditory features should complement the game, and have a mute option.

Our group recommends that “Mail Tales” be implemented on a touchscreen in the museum and online for a home computer. Our research and interviews showed that museums are moving towards touchscreen technology. Most of the museums we visited, regardless of size and stature, contained touchscreen interactives. Compared to desktop computers, touchscreens have the advantage of captivating the sense of touch, and are a more prevalent form of museum technology. We compared the costs of low end tablets and low end desktop computers, and determined that the benefits of touchscreens outweigh the difference in price. However, the online version of the game should be playable on a home computer. Our interviews with families showed that desktop computers are prevalent in homes and that children have access to them. While we recommend that the BPMA focuses on these two platforms, our design does not preclude future development for smartphones or portable tablet devices.

The next step for the BPMA is to establish a working relationship with a game design company. Once this company is provided with a brief of “Mail Tales,” they should be able to provide a cost estimate. Based on our interviews, we recommend that the BPMA proposes this design to several development companies and chooses one based on their pricing and the manner in which they communicate with the BPMA. It is imperative that the BPMA establishes a solid working relationship with a developing company.

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## Appendix A – Sponsor Description

The BPMA was established in 2004 with the goals of managing the public records of the Royal Mail Archive and developing greater access to the former National Postal Museum's collections. The history of the BPMA is "strongly linked with that of the Royal Mail Group" (British Postal Museum & Archive, 2006). The Royal Mail Group started as an extension of King Charles I's private mail service to the public in 1635. After the establishment of the General Post Office, and re-establishment in 1660 by King Charles II, the General Post Office grew as an organization.

By the Victorian era, the General Post Office had expanded by taking over various independent postal services. It benefitted further by the introduction of uniform penny postage in 1840 (British Postal Museum & Archive, 2006). The previous system for postage payment was based on the number of sheets of paper sent as well as the distance sent, and were paid by the recipient rather than the sender. Under uniform penny postage, postal charges were by weight and paid by the sender. This eliminated possible abuses in the system, and made postage more affordable and open to the public (British Postal Museum & Archive, 2008).

In the late 1960's, the General Post Office became a public corporation as opposed to a government program (British Postal Museum & Archive, 2006). The Royal Mail Archive began as the government's first attempts to organize archives, spurred on by the 1838 Public Records Act. The Public Records Acts of 1958 and 1967 put in place additional regulations to control the maintenance of and public access to the archives (The National Archives, 2010). The BPMA not only houses these archives and makes them open to the public, but also holds the collections of the former National Postal Museum which was opened in the King Edward Building near St. Paul's Cathedral in London in 1966. The National Postal Museum's enormous collection includes postal uniforms, equipment, vehicles, and other artifacts. Unfortunately, in 1998 the King Edward Building was sold, and the National Postal Museum was closed.

The archives of the Royal Mail Group and the collections from the National Postal Museum were brought together to form the BPMA in 2004 (British Postal Museum & Archive, 2006). The BPMA intends to use the archives and collections to educate the public on matters such as the history and activities of the British Post Office, as well as similar organizations worldwide (1102360 - Postal Heritage Trust, 2012). This is in conjunction with their normal

responsibilities as a museum is to collect, manage, and repair artifacts pertaining to the genera of the BPMA. Besides collecting and preserving these artifacts for posterity and research, the items from the collections are used to develop exhibits for the public (British Postal Museum & Archive, 2010). The artifacts the BPMA collects and has on hand contain far more variety than one might suspect. Through the title of the museum one can accurately assume that the exhibits will contain postage stamps, mail cars, and uniforms. This is not the entire extent of the BPMA's collection. Their objects range from correspondence from notable persons to weapons. The BPMA has been active in reaching out to new audiences with exhibits and programs that are not limited to just their museum grounds. Recently, the BPMA has partnered with over ten different organizations to create the *Festival of Stamps*, which has many exhibits occurring in a variety of venues. This will allow the BPMA to reach out to more people and teach them about their passion (British Postal Museum & Archive, 2010). They have also opened replica post offices, created a social media following, and provided teaching materials that teachers can access through the Internet.

The museum draws in visitors through a few different means, including exhibitions, the Search Room, the museum website, and the museum's blog. Over the past year, the museum has attracted most of its traffic through electronic methods, including over 400,000 visitors to their website, 72,566 visitors to their blog, and over 226,000 visitors to BPMA's exhibitions (Figure 11). The museum also has a membership program that provides members with added benefits that can enhance the museum experience. Total membership in the beginning of 2011 was approximately 290 members, a slight decrease from 301 in 2010 (British Postal Museum & Archive, 2011).

The BPMA comprises three separate venues: the Royal Mail Archive located in Clerkenwell, central London, the British Postal Museum Store in Debden, Essex, and the Museum of the Post Office in the Community located above the Post Office in Blists Hill Victorian Town, Shropshire (British Postal Museum & Archive, 2011). The Royal Mail Archive is the BPMA's main office, as well as the location of the Search Room, which houses the museum's archives that are free and open to the public



**Figure 37 - Visitation Numbers (British Postal Museum & Archive, 2010)**

(British Postal Museum & Archive, 2011). The British Postal Museum Store houses a number of BPMA's larger exhibits that offers open days for the public to see the exhibits. Since it is more of a storage facility than a museum, it is not always open to the public (British Postal Museum & Archive, 2011). The Museum of the Post Office in the Community is a smaller museum that specializes in the role that postal communications has played in Great Britain (British Postal Museum & Archive, 2011). The BPMA has a full-time staff of 36 employees and numerous volunteers, including 20 in the 09/10 year alone (British Postal Museum & Archive, 2010). A Board of Trustees containing 14 members (with the five new members added in the past year) oversee the management and operation of the BPMA (British Postal Museum & Archive, 2010). The BPMA staff is divided into seven distinct 'teams.' The teams include Access & Learning, Archives & Records Management, Curatorial & Preservation, Admin & Central Functions, Cataloguing, Development & Communications, and User Services (British Postal Museum & Archive, 2011).

As an independent charity, the BPMA qualifies for a number of different funding sources. The museum's primary source of funding, however, comes from the Royal Mail Group. The BPMA was founded by the Royal Mail Group as a separate charity to manage the Heritage unit of the General Post Office; for this purpose, the Royal Mail Group sends an annual payment to the BPMA. In addition, the museum has received multiple grants since its inception in 2004. In the 2009/2010 fiscal year, the museum has received seven grants to aid in its projects (British Postal Museum & Archive, 2010). One of these grants came from the Heritage Lottery Fund, which is a portion of the U.K. National Lottery income dedicated to funding projects to promote the nation's heritage. This grant was rather substantial, bringing in £2,617,800 for the museum to invest in various projects (British Postal Museum & Archive, 2010).

The BPMA has other means of income, including licensing deals, private donations, and the Friends of the BPMA. The licensing deals include deals with Hornby, a leading producer of model trains, Uniqlo, a Japanese clothes producer, and Gift Republic, an online retailer of gift products (British Postal Museum & Archive, 2010). The exact nature of these deals is not publicly known, but the tone of the BPMA 2010 Impact Report suggests that the deals were rather lucrative. In addition, the museum is aided by the Friends of the BPMA, a charity dedicated to supporting the museum. The membership fees have recently been raised from £15 to £20 per year for U.K. members and from £20 to £25 for non-UK members. The proceeds from

these funds go towards museum projects and members events (British Postal Museum & Archive, 2010).

## Appendix B – Online E-Learning Evaluations

Museum:			
Date Visited:			
Name of Application:			
URL:			
	<b>1</b>	<b>2</b>	<b>3</b>
Ease of Navigation (1 = Difficult, 3 = Easy)			
Level of Interaction (1 = non-Interactive, 3 = Interactive)			
Clear communication of content (1 = Unclear, 3 = Clear)			
Relevance to Key Stage 2 Curriculum (1 = Irrelevant, 3 = Relevant)			
Visual Elements (1 = Unattractive, 3 = Attractive)			
Auditory Elements (1 = Disruptive, 3 = Enhancing)			
Age Appropriate (ages 7-11)			
Level of Entertainment			

## Appendix C – In Museum E-Learning Evaluations

Museum:			
Date of Visit:			
Exhibit:			
Type of Tool:			
	<b>1</b>	<b>2</b>	<b>3</b>
Was this tool easy to find? (1 = Difficult, 3 = Easy)			
Is this tool easy to navigate? (1 = Difficult, 3 = Easy)			
How interactive is the tool? (1 = Boring, 3 = Engaging)			
Is the content relevant to the exhibit? (1 = Irrelevant, 3 = Relevant)			
Is the educational value of the content age appropriate? (ages 7-11) (1 = Complicated, 3 = Simple)			
Is the educational material clearly communicated? (1 = Unclear, 3 = Clear)			
Relevance to Key Stage 2 Curriculum (1 = Irrelevant, 3 = Relevant)			
Visual Elements (1 = Unattractive, 3 = Attractive)			
Auditory Elements (1 = Disruptive, 3 = Enhancing)			



## Appendix D – E-Learning Experts Interview Script

### Sample interview questions:

1. What kind of duties does your position entail?
2. What e-learning programs do you have experience with?
3. What characteristics do you look for in an e-learning application?
  - a. What has worked in the past? What hasn't?
  - b. What criteria do you use when analyzing an e-learning program?
  - c. Do you have experience with e-learning tools targeted towards children (ages 5-16)? Is there a specific approach you use for such an age group?  
Where do you see e-learning in 5 to 10 years?
5. (Optional) What are some of the costs associated with building an e-learning tool?
6. What e-learning approaches do you think could be applied to museums?

## **Appendix E – Museum E-Learning Interview Questions**

- What e-learning options do you offer online and in your museum?
- Since the BPMA has never created an e-learning tool, we were wondering if you could describe the process of developing an e-learning tool.
- What are some of the biggest issues that could come up in the development process?
- Do you know some of the costs associated with your e-learning programs?
- Of the e-learning tools offered in your museum and online, are any targeted toward specific age ranges or Key Stages? If so, what are they?
- Do your online and museum tools follow the National Curriculum?
- Do you know if your online tools are used in schools?
- What are some of the benefits that have come out of implementing these e-learning tools? Have you received any feedback from visitors on your e-learning tools?

## Appendix F – Family Fun Day Interview Script

**1. Introduction** (*who we are, what our project is, etc.*)

**2. Questions**

Do you allow your children to play computer games?

**2a. If yes:** How do they start playing these games? Do you (*a*) introduce the games to them, or (*b*) do they find them on their own?

*If they pick (a):* Why these games?

Do they play with or without your supervision?

What kind of games do they play?

Do any of these games have an educational component?

What do you like about these games?

Do you encourage your children to play educational computer games?

Which platforms do your children play games on (e.g. Xbox/PS3/Wii, iPhone/Android, PC/Mac, etc.)

**2b. If no:** Why not? What do you particularly dislike about games? Would you consider letting your children play an educational computer game?

**3. Presenting our game ideas**

*We will present an outline of our game to the parents and explain the concept of the game if they seem interested. If they seem like they want to hear more about it, we will show them examples of our mini-games.*

## Appendix G – Mail Rail Open Day Interview Script

### Script

“In Mail Tales, the player creates an avatar that travels through time, playing games and learning about the history of the U.K. postal service. In his time travels, the player encounters key figures and primary source documents from postal history. They teach peculiar facts about the postal service and illustrate the importance of postal history.”

[*Present Game Map*] “This is a map of Mail Tales, where each island represents a time period in postal history. Each time period contains several mini-games, each mini-game teaching a different topic in postal history.”

“[*Point to Tibs*] This is Sir Tibs, the Postal Service Cat. In the past, post offices employed cats to get rid of rats in the office; these cats were given a home and a weekly salary. Tibs was one of the greatest postal service cats. He guides the player through the different time periods.”

“One of the time periods in Mail Tales is the Victorian Era. Clicking on the Victorian Era island takes you to the Victorian Era title screen [*present title screen*]. In this title screen, Tibs offers you the options of playing one of the mini-games or returning to the map. There are three mini-games in this time period: *Traveling Post Office*, *Build Your Own Stamp!*, and *Save the Mail!* Clicking on the Traveling Post Office game will open a popup window that introduces the mini-game [*overlay popup screen*]. Here, the creator of the TPO, Frederick Karstadt, explains the purpose of the TPO and how to play this game [*pause and give time to read written intro*]. From here you can either choose to go back to the title screen or play the mini-game.”

“[*Present gameplay screen*] In this game, the player’s avatar is standing on a platform between two moving mail trains. The trains are moving towards the bottom of the screen, and the player has to retrieve the mail bags hanging out of the trains before the trains pass. Clicking on a mail bag will make the avatar run over and grab the bag. The counter in the corner shows how many bags have been collected. [*Present reward/conclusion screen*] At the end of the game, Frederick Karstadt congratulates you and rewards you with a stamp and a model of a TPO train. From here you can choose to view their Inventory, view the Stamp Book, or return to the Victorian Era.

“[*Present Stamp Book*] The Stamp Book shows the stamps you have already collected and which stamps are still missing. Stamps can be collected by completing mini-games and visiting the museum to collect special edition stamps. As you can see, here is the stamp you

received from the Traveling Post Office mini-game [*point to TPO stamp*]. Stamps from previous games [*point to Early Days stamps*] are also shown here. [*Present Inventory*] The Inventory shows your collection of artifacts from different time periods. Inventory items can be acquired by completing certain mini-games as well as visiting the museum.

*[If the parents seem interested and would like to hear more, explain our other ideas for mini-games].*

### **Questions**

#### *Game Map + Tibs*

1. Would our Game Map be easy for your child(ren) to navigate?
2. Does the Game Map clearly explain the idea of traveling between time periods?
3. Would the inclusion of Tibs spark your child(ren)'s interest in the game?

#### *Victorian Era:*

4. Does the avatar seem like it would enhance this mini-game?
5. Does the mini-game introduction clearly explain the historical context of the mini-game

#### *Rewards:*

6. Would the inclusion of a Stamp Book and an Inventory make your child(ren) want to play the other mini-games?
7. Would your child(ren) want to return to the museum to collect more stamps or inventory items?
8. Other notes

## Appendix H – Scanned Story Board Images

H-1: Overall Game Map



H-2: Avatar Creation Screen

Create an Avatar:

Name: \_\_\_\_\_

Gender:  M  F

Hair Color:  Brown

Hair Style:  Short

Skin:  Beige

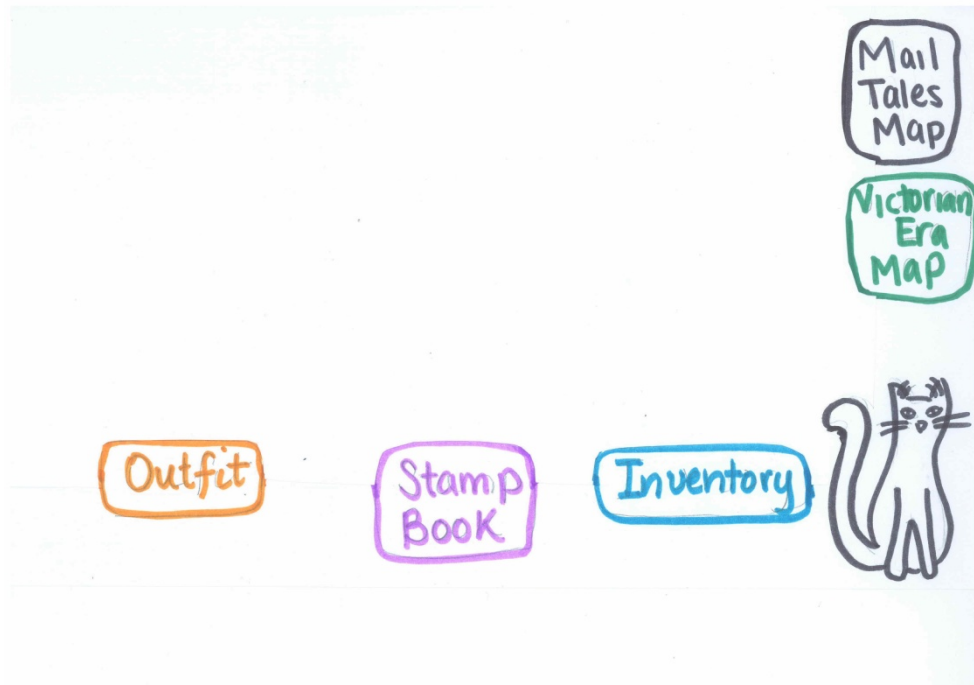
---

Torso:  T-shirt

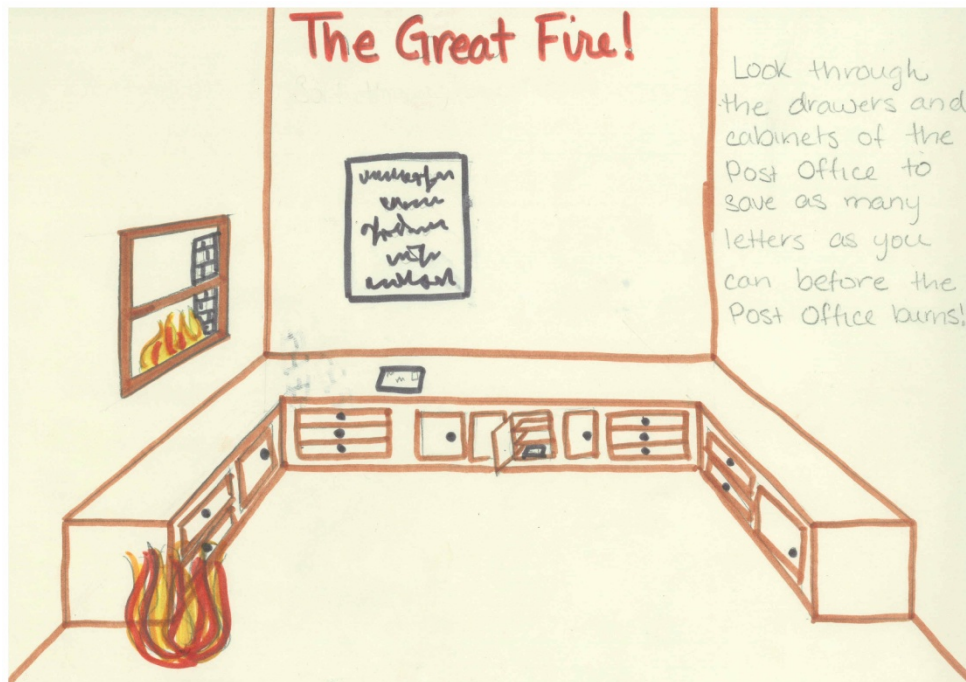
Legs:  Skirt

-C Hudson

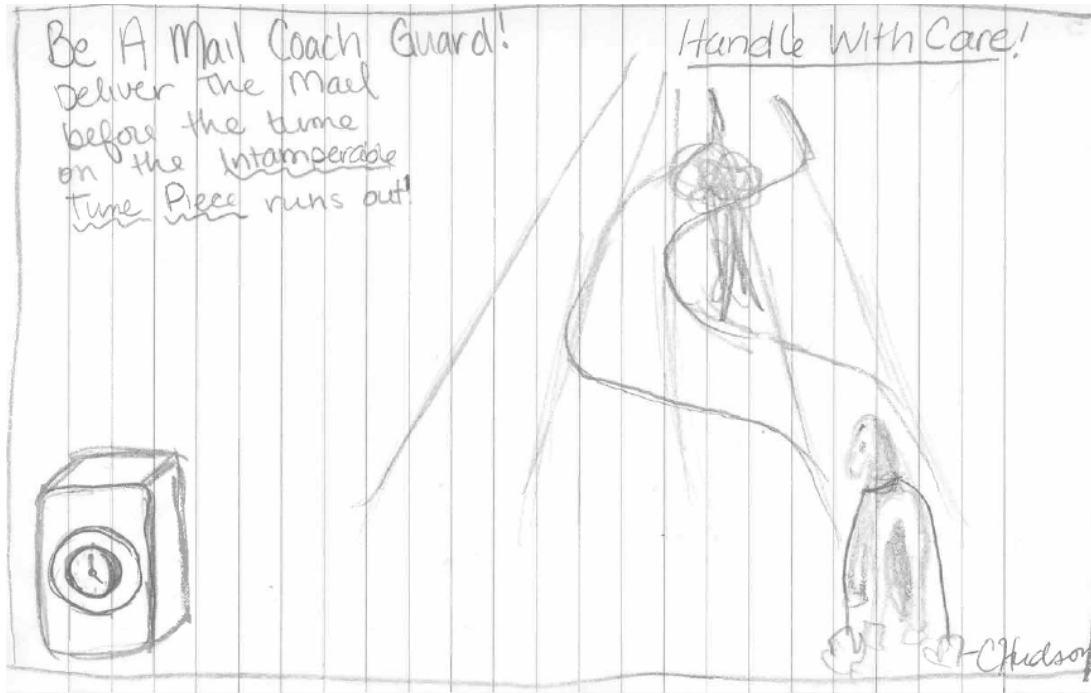
### H-3: Navigation Border



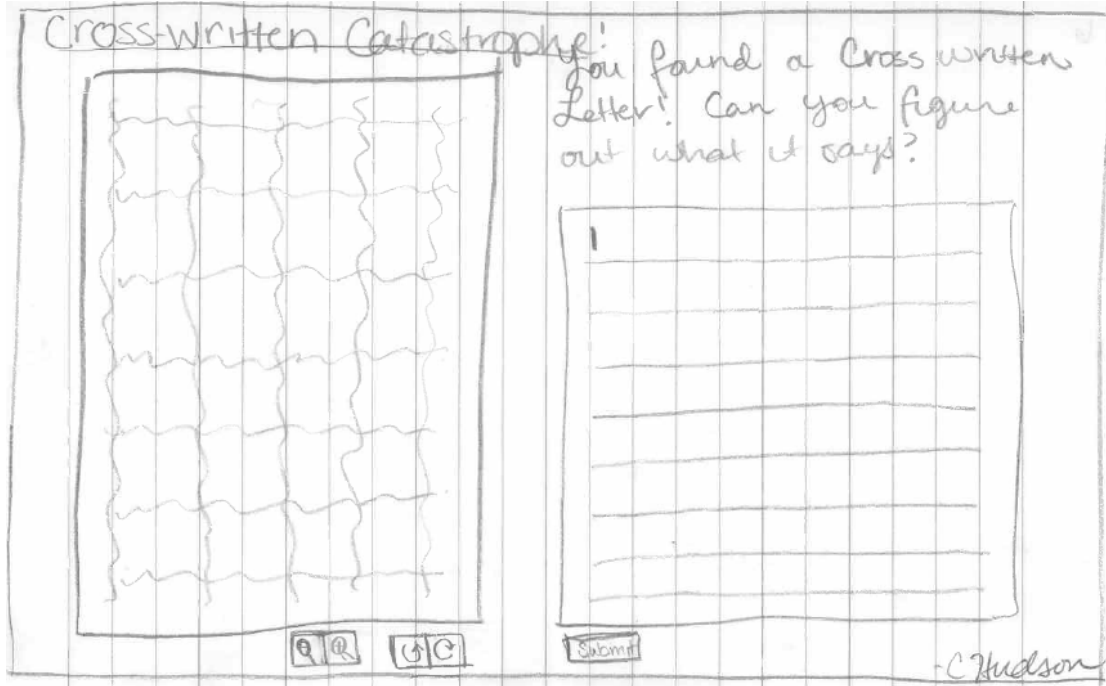
### H-4: The Great Fire of London



### H-5: Mail Coach Guard

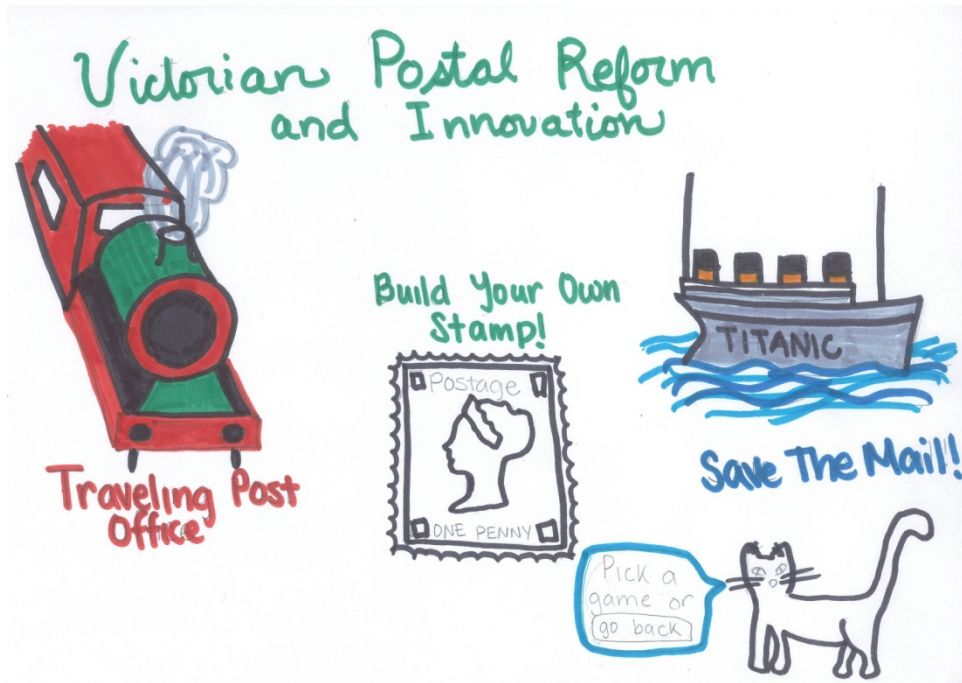


### H-6: Cross Written Catastrophe





H-7: Victorian Era Title Screen



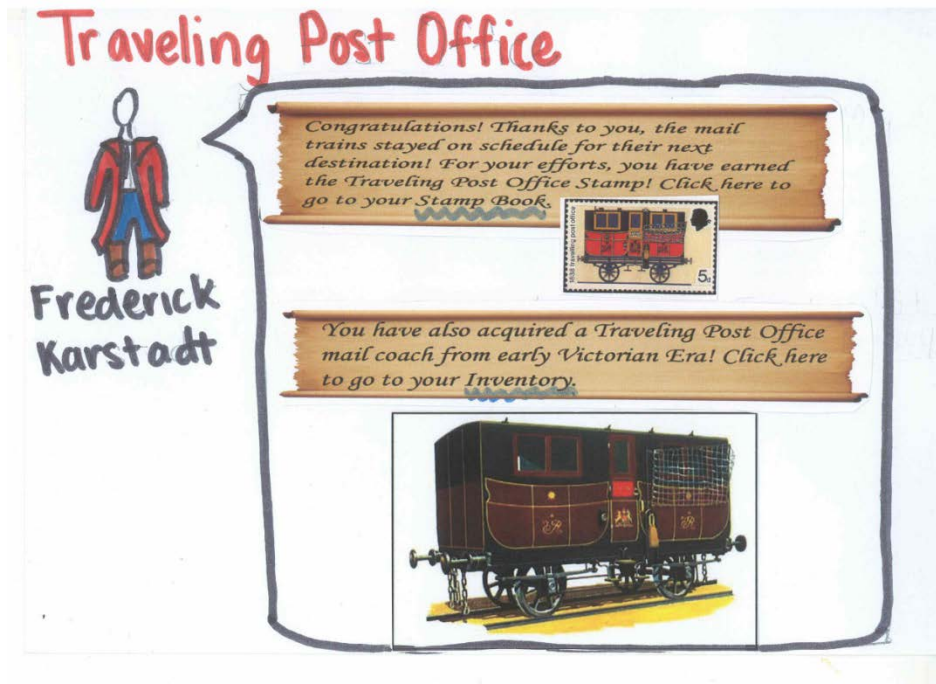
H-8: Traveling Post Office Introduction Screen



H-9: Traveling Post Office



H-10: Traveling Post Office Conclusion Screen

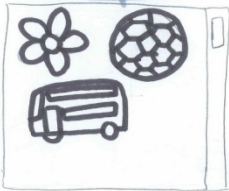


## H-11: Build Your Own Stamp

# Build Your Own Stamp!

It's your turn to create your own stamp!

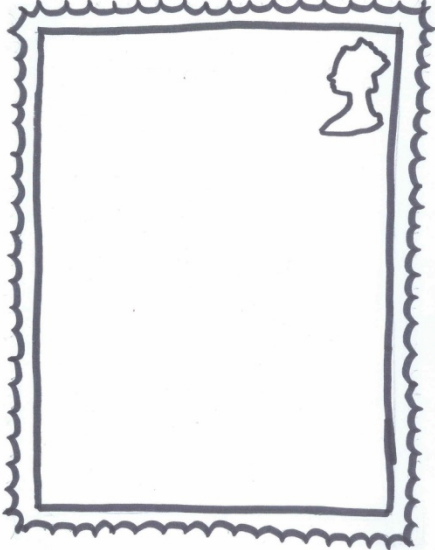

Shapes



Colors

- red
- orange
- yellow
- green
- blue
- purple
- black


Examples:



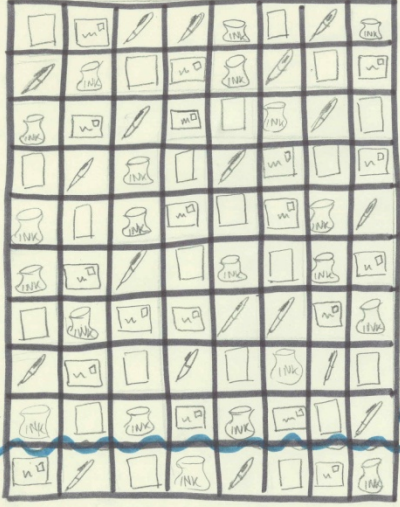
## H-12: Save the Mail!

# Save the Mail!

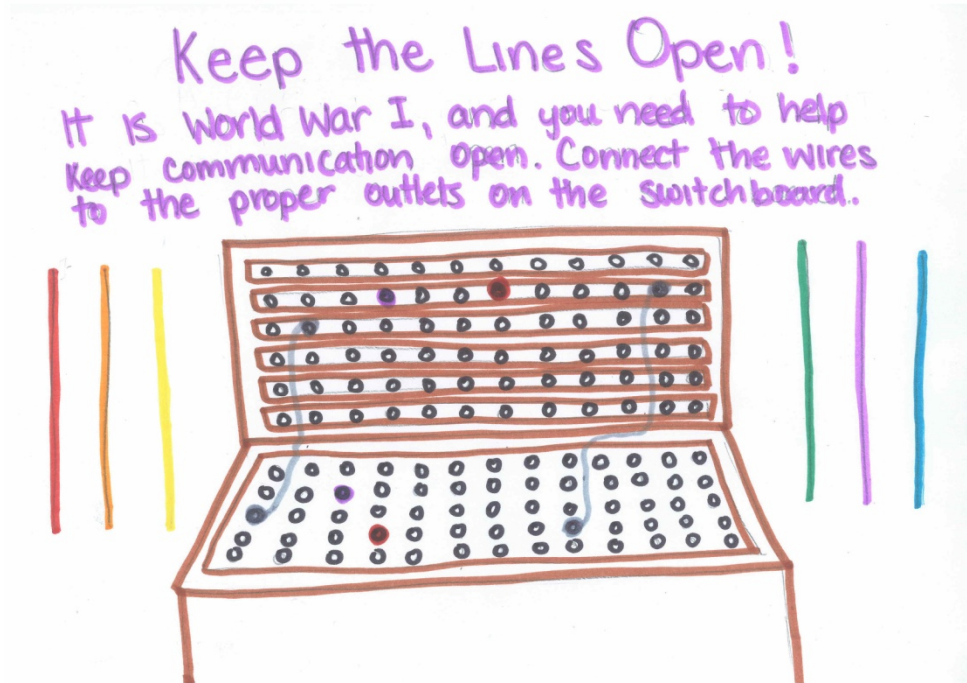
Save as much mail from the sinking Titanic as possible.



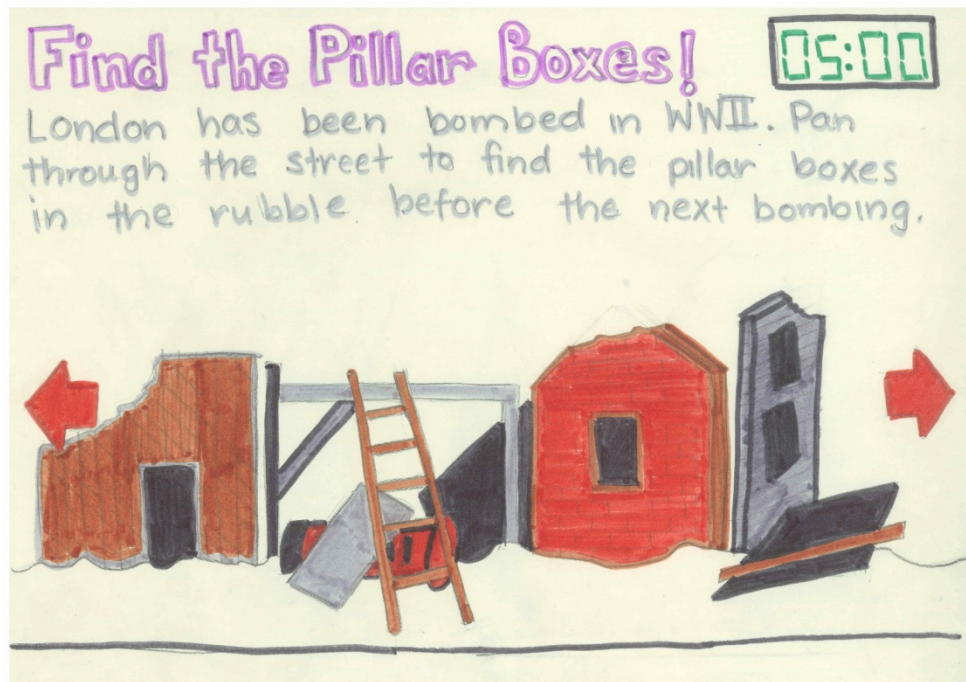
Letters saved:



### H-13: Keep the Lines Open



### H-14: Find the Pillar Boxes



### H-15: Dire Decoding

It's WWII and you work for the post office cracking enemy codes. Crack the Code to find the army's location.

DIRE Decoding!

[ ]		[ ] [ ] [ ] [ ]		[ Key Word ]		
A	B	C	D	E	F	G
H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z	[ ]	[ ]

-CHudson

### H-16: Deliver the Letter!

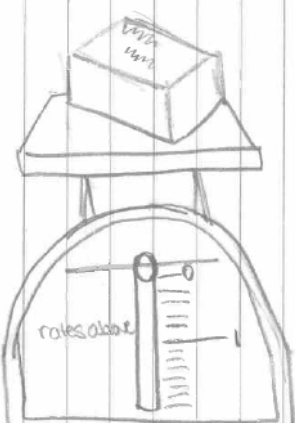
Deliver the letter!

You are a telegraph boy during the Golden Age of the Post Office. Find your way to deliver your letter!

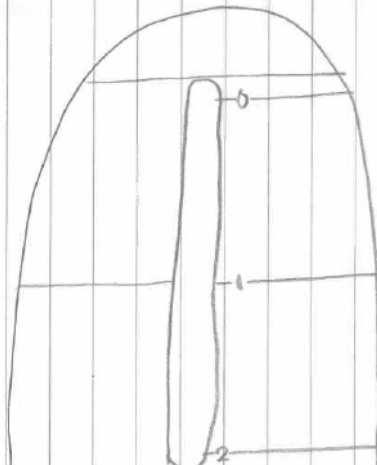
-CHudson

### H-17: Calculate the Cost

Calculate the Cost



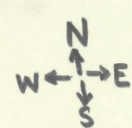

close-up on label




You are a clerk at the Post Office. Figure out how much to charge customers based on the weight of their parcels. (adding parcels) -Chudson

### H-18: Post with Poco

London

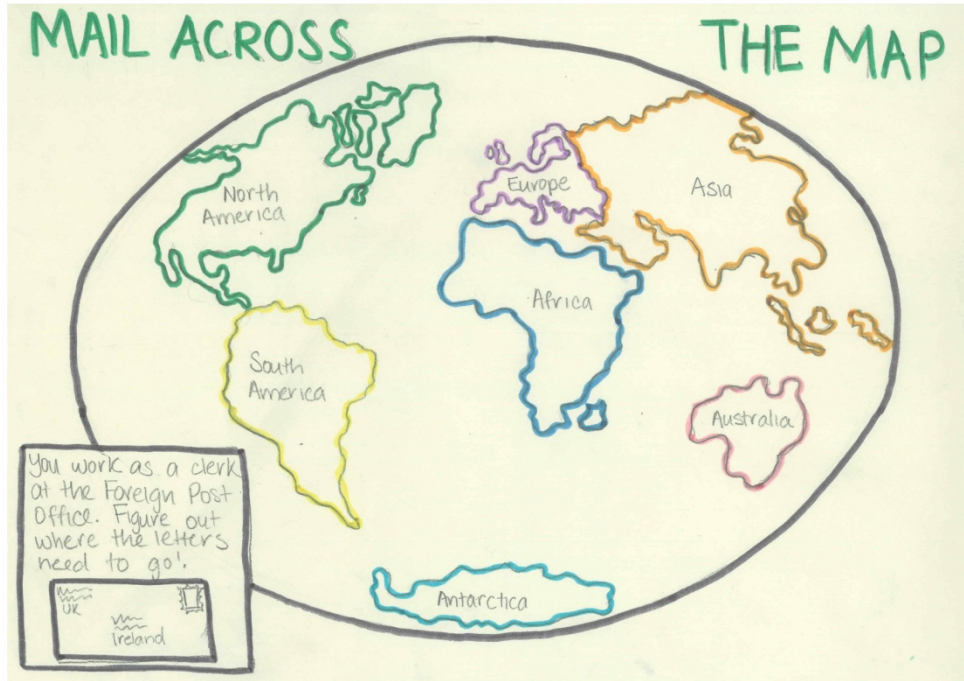


Post with Poco!



Drag Poco to the location of the given postcode!  
Find:

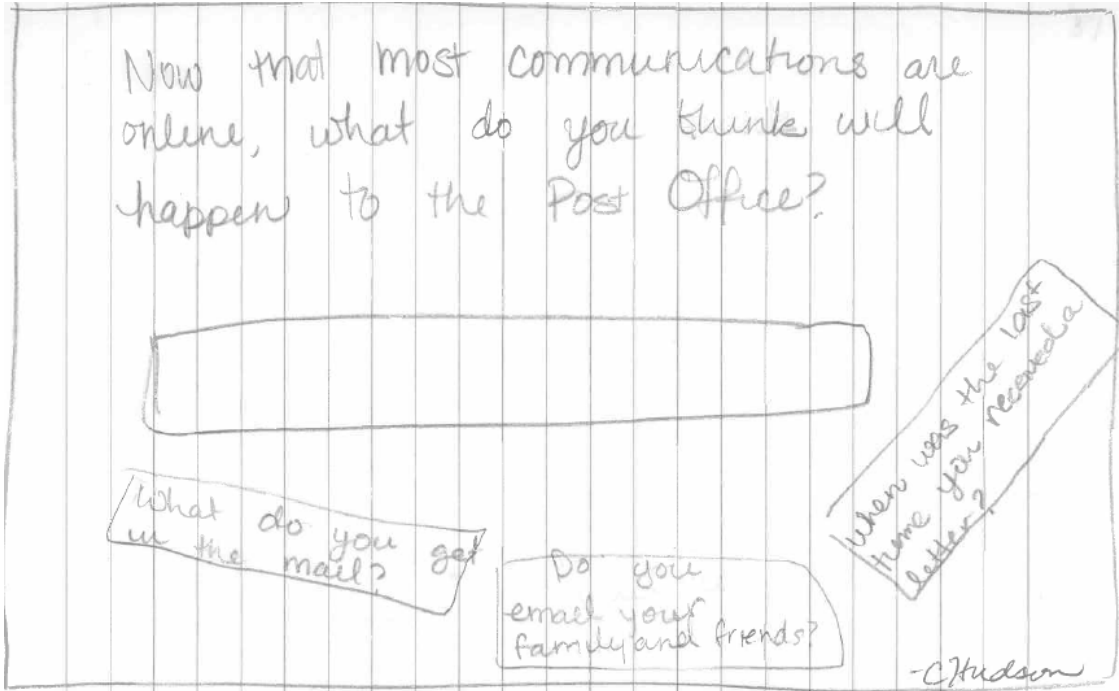
H-19: Mail Across the Map



H-20: Without a License



H-21: Comments





## **Appendix I – Teacher Handout: National Curriculum Relevance**

### **Great Fire of London**

History, Unit 5 - The Great Fire of London: students learn about the destructive force of the Great Fire of London and its consequences.

### **Handle with Care**

No direct tie to curriculum

### **Cross-written Catastrophe**

The content of letter will be of historical significance that can be linked back to the Key Stage curriculum relating to that time period.

### **Traveling Post Office**

History Unit 12, Section 3 - Arrival/expansion of railways: User learns how expansion of railways changed the lives of England's population.

### **Build your own stamp!**

Art and Design Unit 3B - Investigating pattern: User organizes and combines shapes to create their own design.

Art and Design Unit 5A - Objects and meanings: User conveys their own ideas and feelings through their own personal stamp

### **Save the Mail!**

No direct tie to curriculum. However, the sinking of the Titanic is a historically significant event and could be used as a story in the English Literacy curriculum.

### **Keep the Lines Open**

History Unit 9, Section 6 - In what other ways might the war have affected people?: this game was intended to be a WWI game, however switchboards were also used in World War II, so this can be taught as part of the Key Stage 2 WWII unit.

### **Find the Pillarboxes**

History Unit 9, Section 6 - In what other ways might the war have affected people? students learn how the war affected daily life.

### **Dire Decoding**

History Unit 9, Section 6 - In what other ways might the war have affected people?: students learn how the war affected daily life. This game teaches about one of the occupations people were involved in during WWII.

### **Deliver that Letter!**

Geography Unit 18, General - Connecting ourselves to the world: students learn about their local area. - students learn about how to navigate through their communities & local area.

Geography, Unit 18, Section 4 - Where is a place? How will we get there?: students also learn “how their locality is set within a wider geographical context.”

### **Calculate the Cost!**

Year 3, Block A (for simple arithmetic): addition/subtraction, greater than/less than, units of measurement, simple word problems, etc.

### **Mail Across the Map**

Geography, Unit 18, General - Connecting ourselves to the world: students learn about world geography, and how to locate other countries.

### **Post with Poco**

Geography, Unit 18, General - Connecting ourselves to the world: learn about how to navigate through their communities & local area

Geography, Unit 18, Section 4 - Where is a place? How will we get there?: students also learn “how their locality is set within a wider geographical context.”

### **Without a License**

History, Unit 13 - How has life in Britain changed since 1948?: relates the Post Office to television, an aspect of popular culture that the users interact with more frequently than the Post Office itself.

### **Comments**

Geography, Unit 18, Section 3 - Why do people use e-mail? What is our local area like?: questions about “what e-mail is, why people use it and how it differs from posting a letter.”

ICT, Unit 3E - Email: students learn about “communicating over distances” and “consider and compare different methods of communication.”