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Playful Learning: The Disposition of Architecture as Pedagogy

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PLAYFUL LEARNING

THE DISPOSITION OF ARCHITECTURE AS PEDAGOGY

PLAYFUL LEARNING:
THE DISPOSITION OF ARCHITECTURE AS PEDAGOGY

Approval of Thesis Research
Project Book is Presented to:

Arief Setiawan

and to the
Faculty of the Department of Architecture
College of Architecture and Construction Management

by

Alyssa Franklin

In partial fulfillment of the requirements for the Degree

Bachelor of Architecture

Kennesaw State University
Marietta, Georgia

May 9, 2023

DEDICATED TO:

My family,
for their constant support through the best and longest nights during this program.

To my best friends,
and their uplifting, encouraging, and humorous ways of support.

To Tim,
for the unwavering love and support throughout this program.

Acknowledgements:

To my family and friends that have watched me find my way through this program, the support I recieved is extraordinary,

To Dr. Arief Setiawan for his guidance, understanding, and support not only within this thesis, but throughout my time in the program,

To the faculty in the Department of Architecture, for the challenges that grew my knowledge, confidence, and discipline in my work,

Finally, to Timothy Gatto, the love of my life, for his words of love and encouragement on the best and worst days throughout these past five years,

Thank you.

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CHAPTER ONE

DESIGN THEOREM

1.1 - THESIS STATEMENT

This thesis intends to develop design strategies from the basis of a game that encourages play mentally and within a space. Translating game play into architecture follows the design principles that this thesis is developing to answer a burning question of - what is play? Jean Piaget and Lev Vygotsky, Cognitive Development theorists argue that play is essential for the intellectual development of a child's mind. Through play, children in the Preoperational Stage of Piagets Stages of Cognitive Devlopment can think with more complexity such as making rules, creating narratives, and use symbols. Vygotsky argues that the social environment facilitates play, a form of sociocultural learning. Educational theorists Montessori, Froebel, and Dewey all agrue that play is a necessary tool for learning through hands-on play with toys, games, and real-life teachings through play.

In this thesis, play is the intentional involvment with the environment through freedom, interactivity, and most importantly - learning.

1.2 - THESIS BACKGROUND

Education is a vital aspect of our society. The physical learning environment in which children learn should reflect the values of the society, promoting well-being and healthy growth. Elementary Education is where the most crucial brain development occurs in children aged five to twelve years old. Historically, schools were designed to produce factory workers during the 1833 Factory Act (Dudek, 2000, 11), evidenced through the traditional, direct instruction teaching methods that the architecture reflected. The learning environment in which elementary age children learn should foster play through student engagement, student – teacher collaboration, and student – student collaboration that the architecture welcomes and can be transformed by. Children are transformed by the spaces they are in, spaces that will leave lasting impacts on the cognitive development of the children, spaces that can be playful and imaginative for learning. By looking at how play is beneficial in children's cognitive growth and the crucial role that architecture plays in supporting the learning processes, this research aims to explore the architecture of play as a means to support the children's learning processes and cognitive growth.

Within the various collaborations, a flexible learning environment allows for activity-based learning to occur, which recognizes and allows that each student learns uniquely. By catering towards a fun, interactive, and kaleidoscopic learning environment, the desire to pursue their dexterity and knowledge increases in the young students – furthermore improving the academic integrity and well-being of all young learners.

1.3 - RESEARCH QUESTIONS

1. What are design strategies to create playful architecture that facilitate learning?

2. What are ways that the physical space can stimulate playful learning through enclosure of space, configurations of space, and interactivity?

1.4 - METHODOLOGY

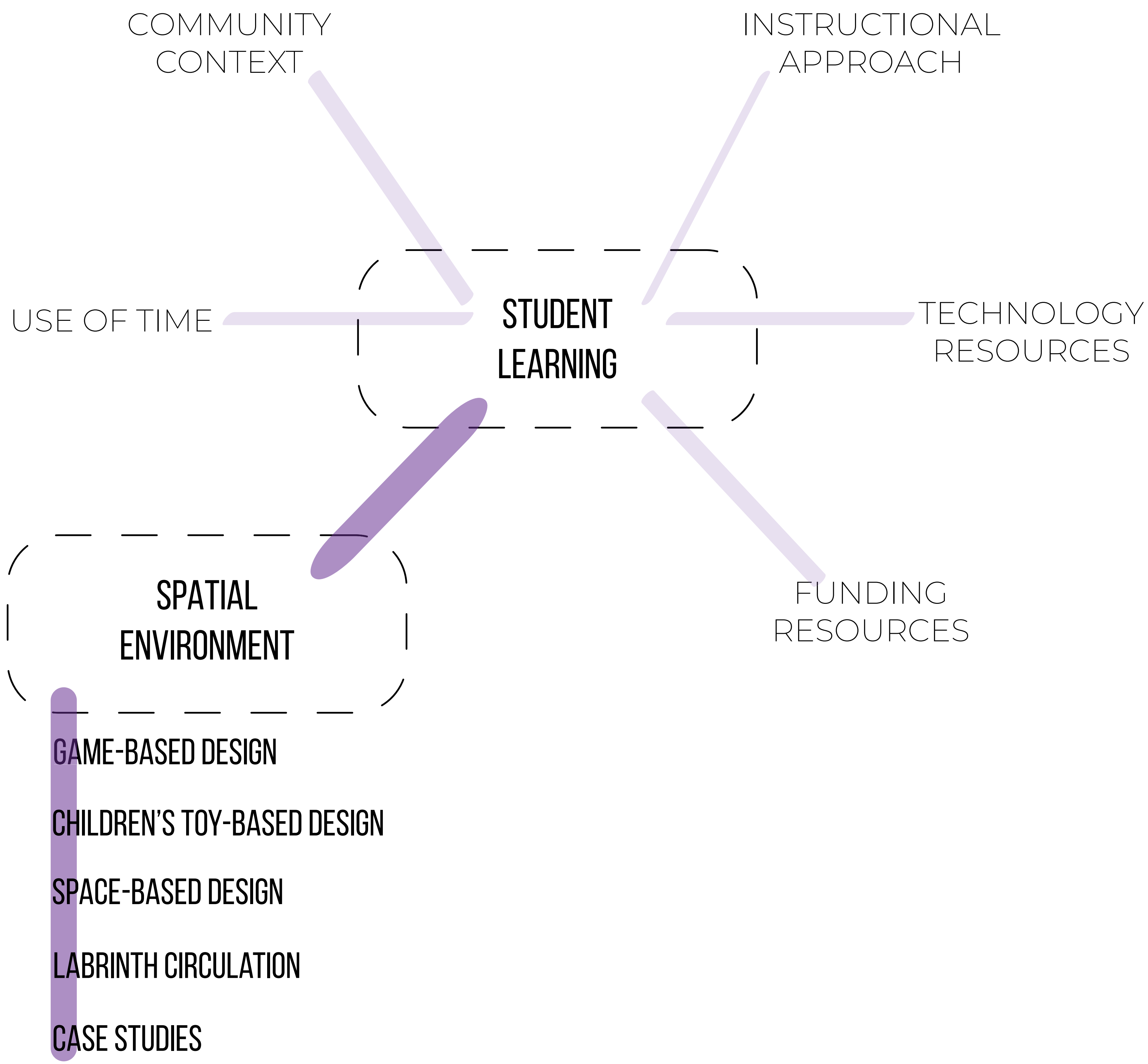


Figure 1.1 - Thesis Methodology

TERMINOLOGIES - Based on the Oxford English Dictionary

Play •/plAY/•
activity engaged in for enjoyment and recreation, especially by children

Constructivism •/ken ‘strəktəvism/•
the theory that says learners construct knowledge rather than just passively take in information

Assimilation •/ə , simi ‘lāSH(ə)n/•
the process of taking in and fully understanding information or ideas

Accommodation •/ə ,kämə ‘dāSH(ə)n/•
the modification of an existing schema to understand new information

Schema •/’ ski:mə/•
a cognitive framework or concept that helps organize and interpret information

Scaffolding•/skaf-uhl-ding/•
process that enables a child or novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts

Equilibrium•/ee-kwi-lib-ree-uhm/•
a state of physical or mental balance or stability

Disequilibrium•/dis-ee-kwi-lib-ree-uhm/•
when a child is unable to use an existing schema to understand new information to make sense of objects and concepts

METHODOLOGY MAPPING

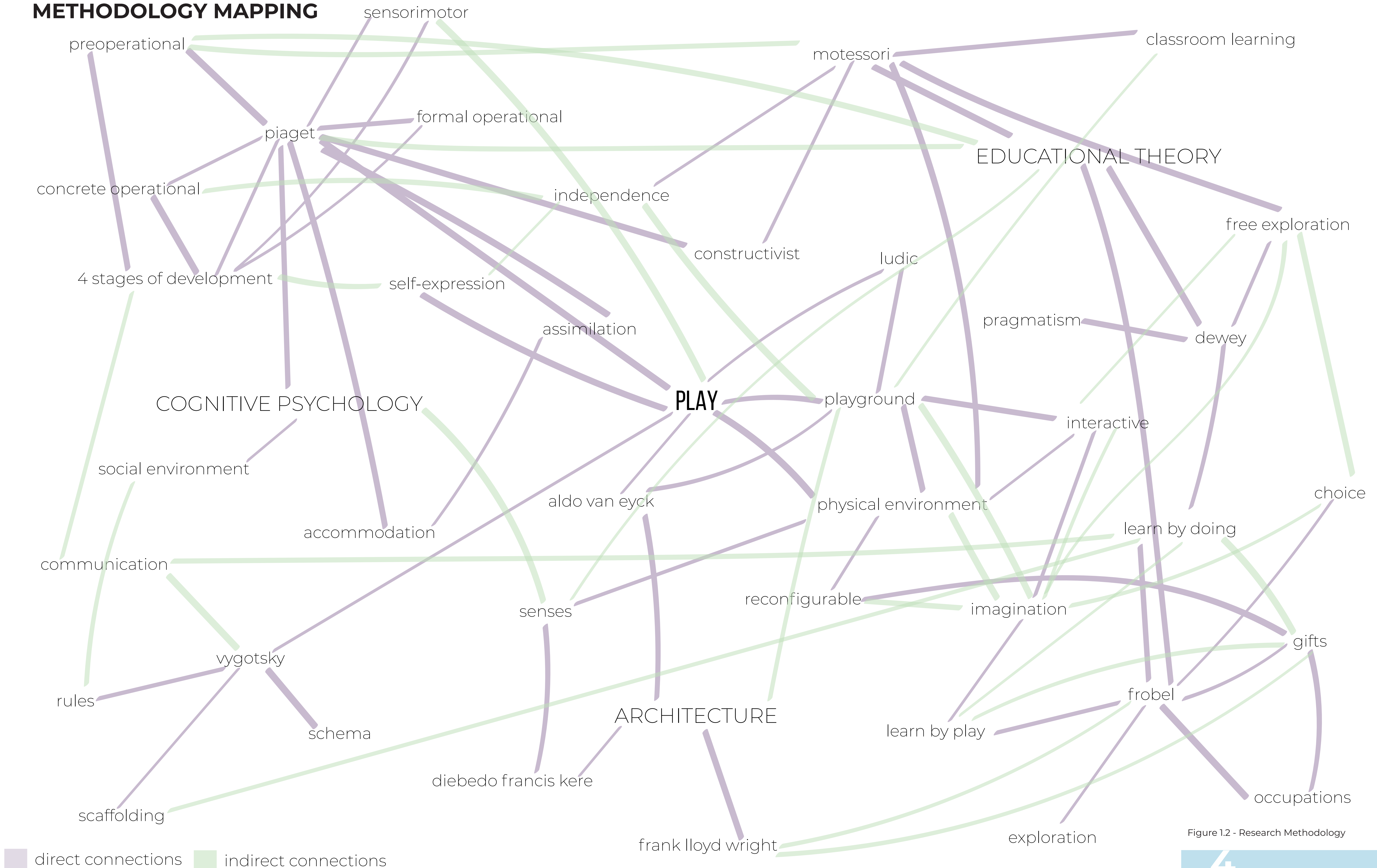


Figure 1.2 - Research Methodology

CHAPTER TWO

DESIGN ANALYSIS

2.1 - CHILD PSYCHOLOGY THEORY
2.1.1 - WHAT IS PLAY?

Play is an essential element to the healthy cognitive, social, and physical development of a child. Play is how children freely explore the environment around them, learning through playing that can teach behavioral and social skills. It is the medium used by children to understand their world. I developed this idea of play based on my research on the work of Piaget and Vygotsky.

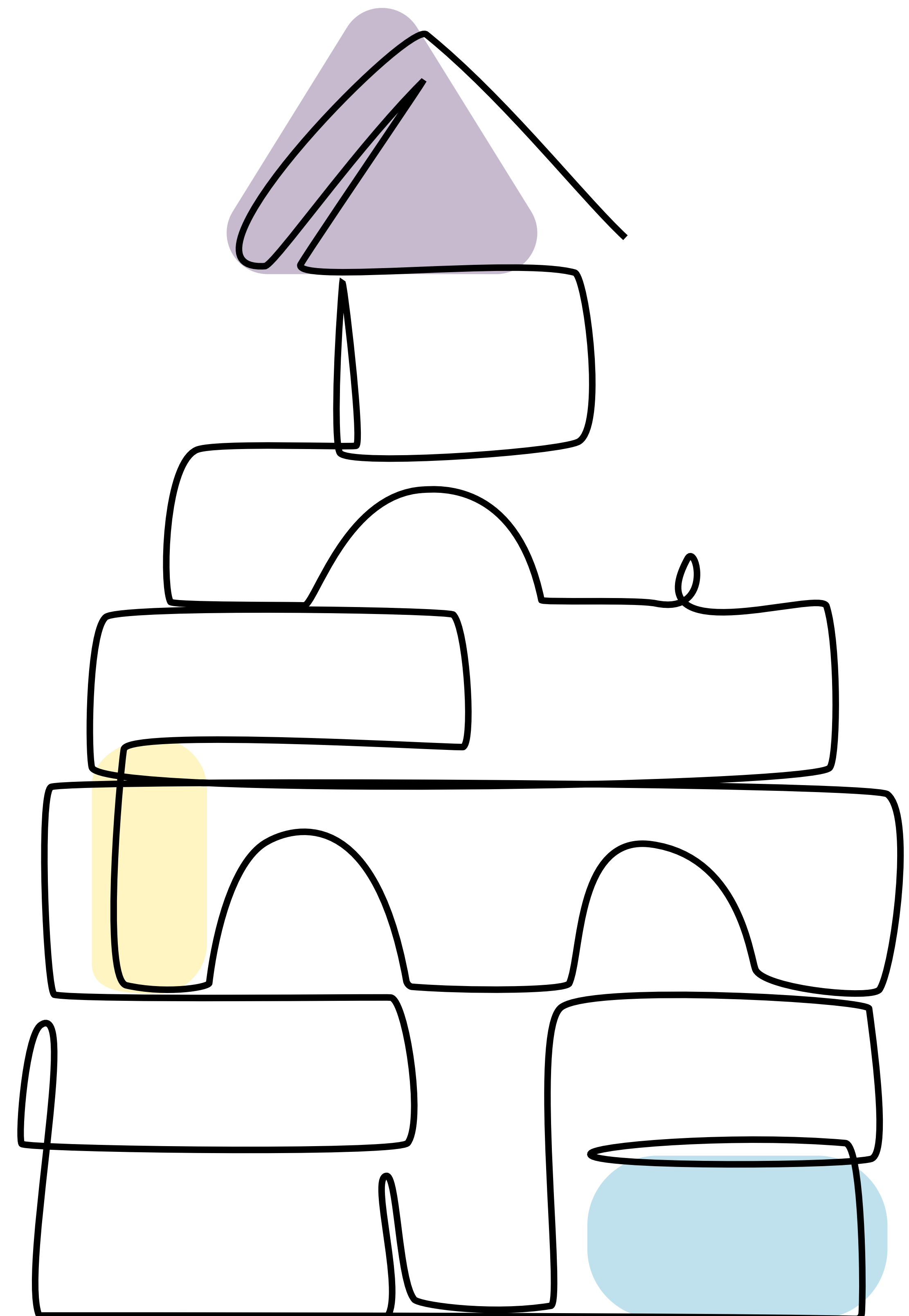


Figure 2.1 - Toy Building Blocks

2.1 - CHILD PSYCHOLOGY THEORY
2.1.2 - THEORISTS

JEAN PIAGET

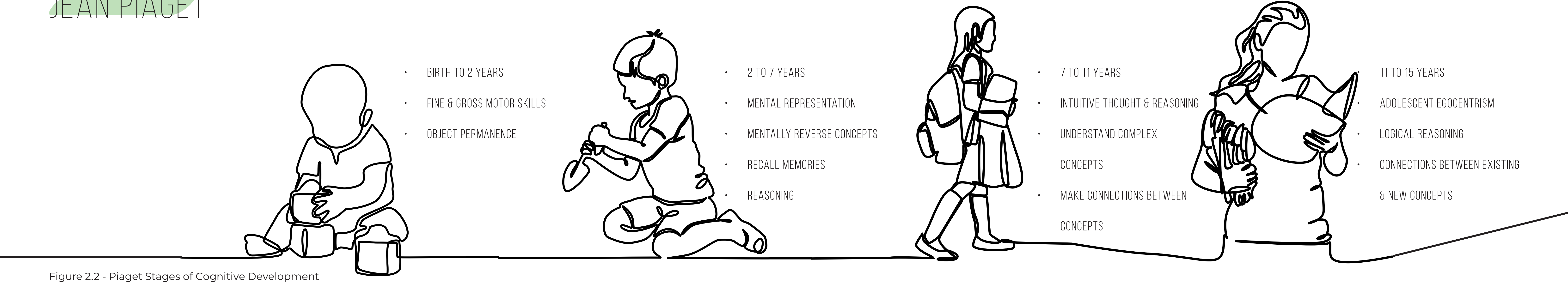


Figure 2.2 - Piaget Stages of Cognitive Development

Jean Piaget was a major figure in the twentieth century as a psychological theorist. He spent much of his adult life experimenting with intelligence tests and researching the cognitive development and processes of a child within a physical environment as means for the child to construct their knowledge. The cognitive development of a human begin at conception and continue until death. Santrock (2021) has outlined Piaget's research. Piaget introduced the concept of schemas, that are mental representations for behavior guidance and are always adapting as a response to the environment through *assimilation* and *accommodation*. Through the organization of these processes children are able to make sense of the world around them through restoring new and previously learned information to create a balance, an equilibration. Equilibration is known as the cognitive flow that causes learning. According to Piaget, each child is unique in their ability to construct their own knowledge within the physical environments around them.

It is here that Piaget developed his *theory of the Cognitive Development of Children, through stages*. Each stage represents a milestone of cognitive growth where the child understands more of the complexity of the physical environment in which they live.

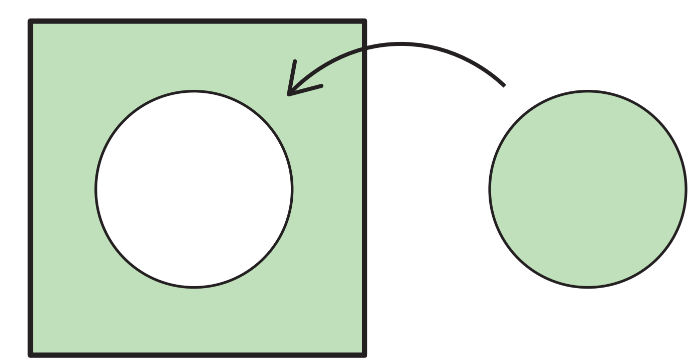


Figure 2.3 - Assimilation Diagram

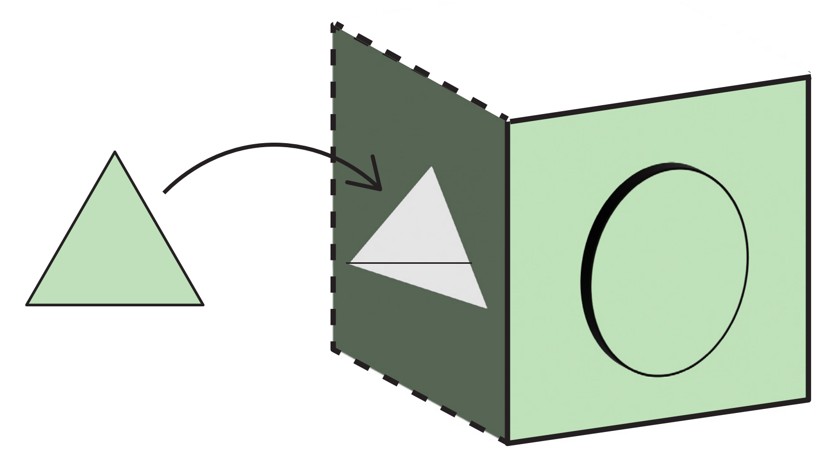


Figure 2.4 - Accomodation Diagram

2.1 - CHILD PSYCHOLOGY THEORY
2.1.2 - THEORISTS

LEV VYGOTSKY

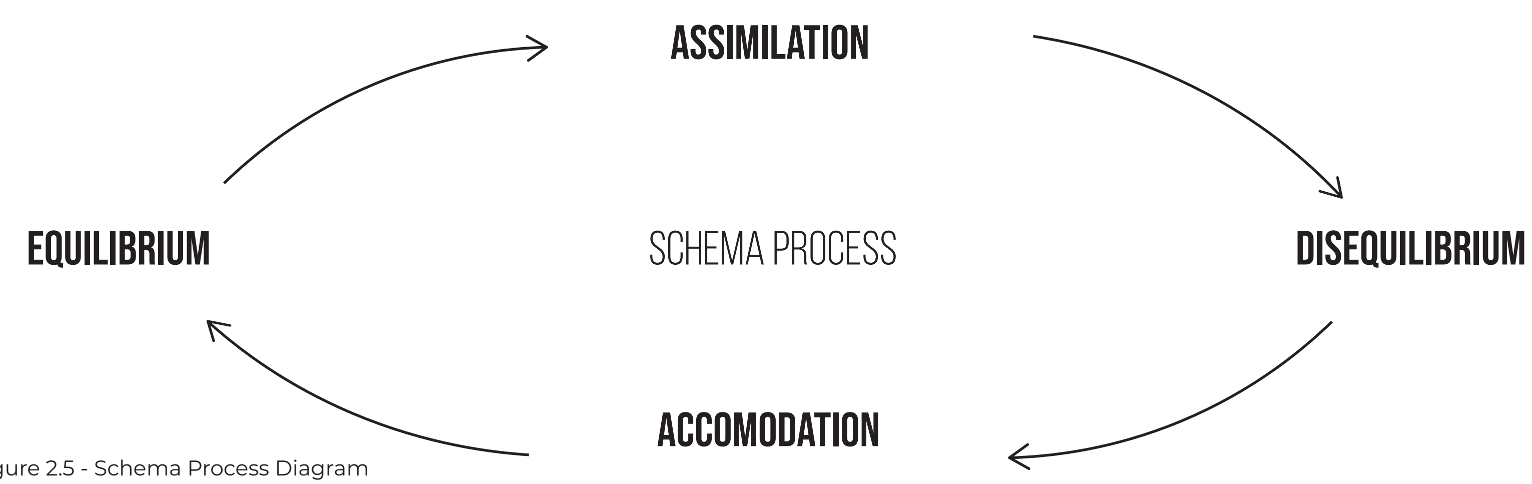


Figure 2.5 - Schema Process Diagram

Lev Vygotsky was a psychological theorist in the early twentieth century. His theory of cognitive development is focused on the social and cultural contexts that a child experiences in order to build their knowledge as Santrock (2021) has discussed. Each social interaction shapes the child's behavior and understanding of their environment. His theory follows the understanding that for a child to learn and develop their cognitive processes, they need guidance. The *zone of proximal development* is the concept where in order for a child to gain knowledge about a concept, they are first aided in the concept and learn to become independent from the aid. As the child's knowledge grows, their zone of proximal development expands. Within the aid required for a child to learn, the instructor uses the method of *scaffolding* where the amount of support varies as the child grows more independent. The *schema process* follows the same conceptual path as the zone of proximal development, but demonstrates how information is learned through the equilibrium flow.

The equilibrium flow always comes back around to keep the mind in equilibrium once new informtion is learned. Vygotsky uses these concepts as a means for how children learn through play to aiding in the childs interactions with others for their cognitive growth.

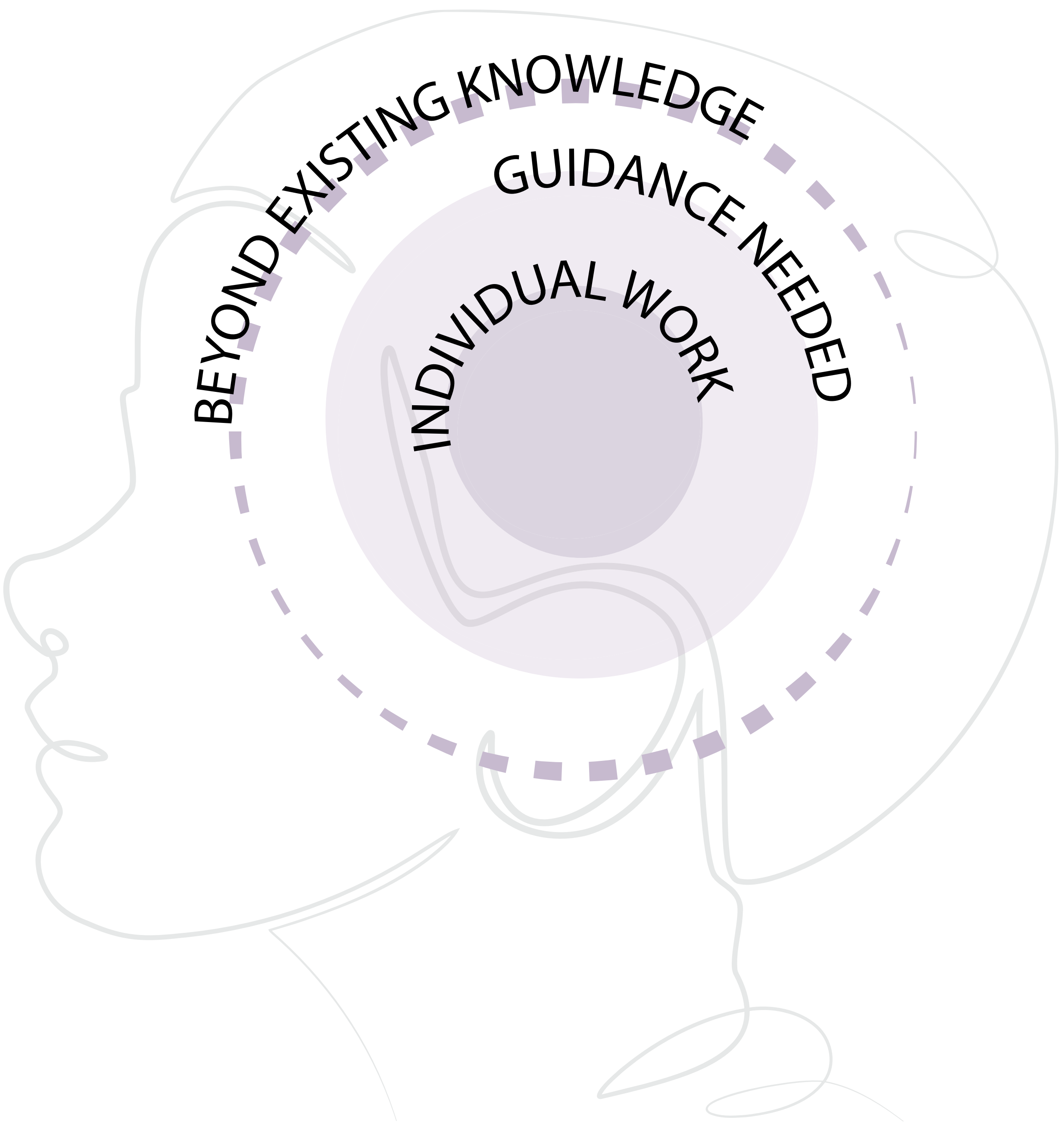


Figure 2.6 - Vygotsky Zone of Proximal Development

2.2 - EDUCATIONAL THEORY
2.1.1 - WHAT IS PLAY?

Play in education is similar to the psychological meaning of play, it is used by children as a means to learn about the environment around them. However, in education the concept of play is used as a platform to teach children the values that reflect the society they grow up in. Education is a reflection of the society that is instilled into the minds of the children, so by having a foundation of play within the educational theories the children can grow within their intelligence, imagination, and well-being. Healthy children contribute to create a healthy society. I developed this idea of play based on the argument came from the research of the Educational theorists including Froebel, Montessori, and Dewey.

Froebel, Monessori, and Dewey are theorists that use play as a basis of their educational concepts. Each has a unique concept that has contributed to the development of education as a whole. From the development of educational toys for children, to the classroom setting that the children learn in, to the framework that children are most responsive to - are all theories that have expanded the knowledge of a

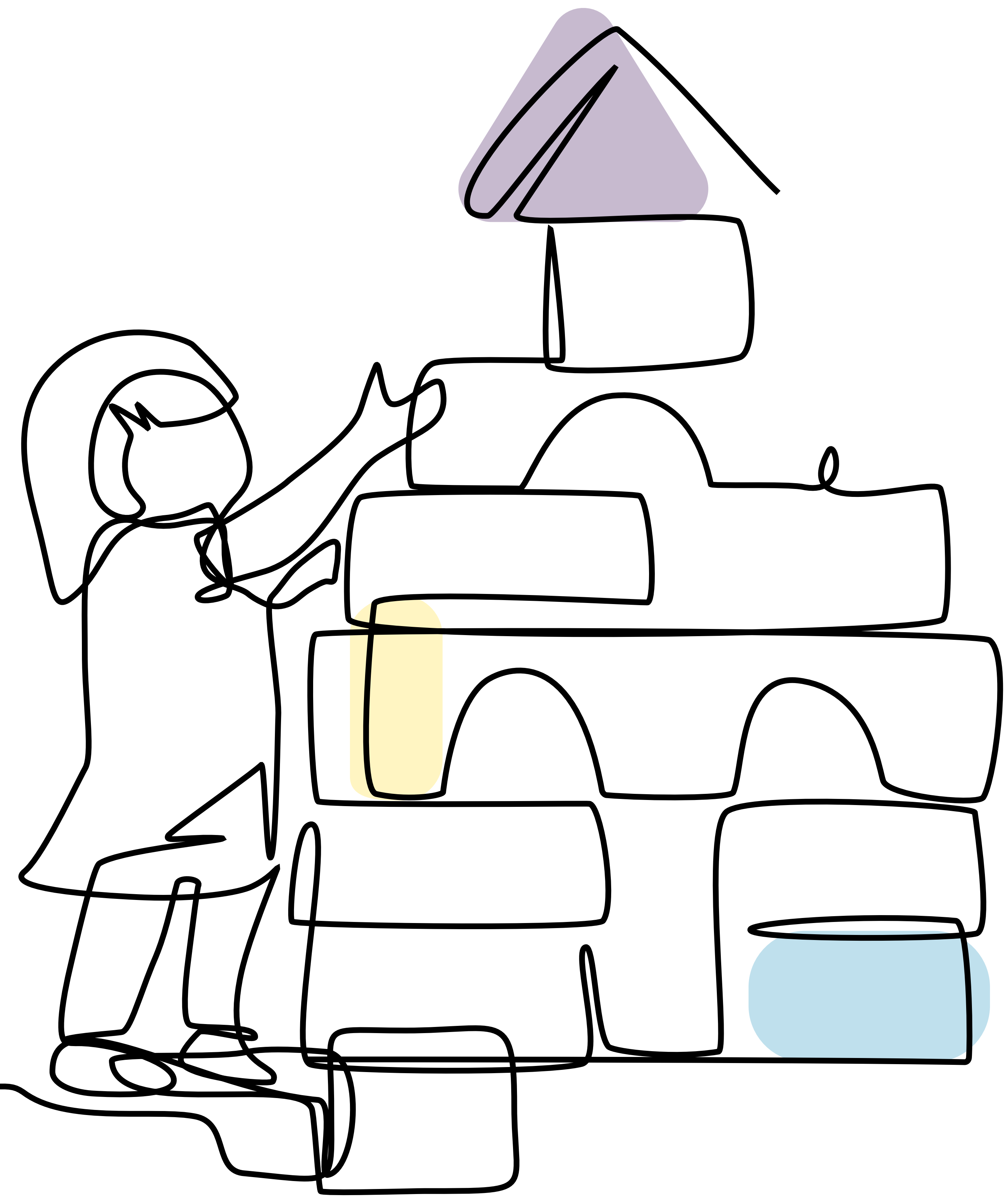


Figure 2.7 - Girl playing with Toy Building Blocks

2.2 - EDUCATIONAL THEORY
2.2.2 - THEORISTS

FRIEDRICH FROEBEL


Figure 2.8 - Froebel Gift #1
https://www.moma.org/collection/works/145025


Figure 2.9 - Froebel Gift #2
https://petlab.parsons.edu/datatoys/toy-planets-blocks-and-yarn/

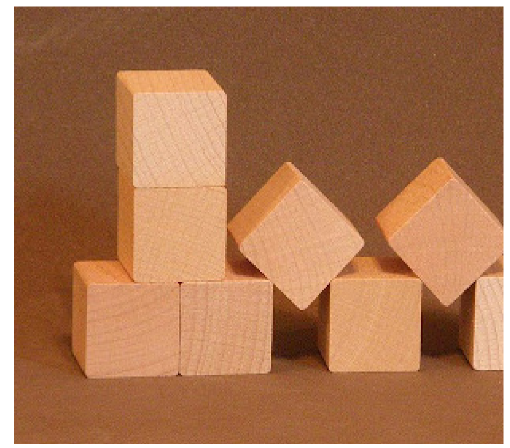


Figure 2.10 - Froebel Gift #3
http://blockplay.blogspot.com/2009/11/froebel-gift-3.html

Friedrich Froebel was an early childhood educational theorist in the early to mid-nineteenth century. He developed the concept of *The Origins of Early Childhood Education* in the 1830's through his Kindergarten, where his philosophy was to treat the children "like plants in a garden" as stated by Brosterman (2002, 34)– to nourish them to help them grow. This was how he viewed the school room, an extension of a garden. Froebel's primary focus was using play as a medium for the growth and development of a child. He developed gifts – child sized toys that allowed for insight and discovery. The goals for the gifts and occupations was "to use sensory information - to manipulate human-made and natural objects - to awaken the mind" (Ogata, 2013, xiii). Occupations followed the teachings of the gifts, at a more complex level. The gifts consisted of colorful balls of yarn – these taught the child intuitive and experimental knowledge of the object, a concept developed by psychological theorist Piaget. Other gifts were dangling shapes of spheres, cylinders, and cubes that could be viewed at all sides and most represented the essence of Froebel's Kindergarten.

The gift that has made a great impact are the blocks that teach volume, direction, the natural sequence of nature, knowledge, and beauty in the forms the children explore. Many of Froebel's gifts are made of wood that provides the children with natural materials that are best for engaging the child's senses. The lessons that are taught by the gifts are tested in the occupations that are more complex processes than the gifts provide. The occupations allow for the children to make connections based on their knowledge from the gifts. For Froebel, the gifts "give the child a new cosmos, the occupation fixes impressions made by a gift" (Brosterman, 2002, 36).

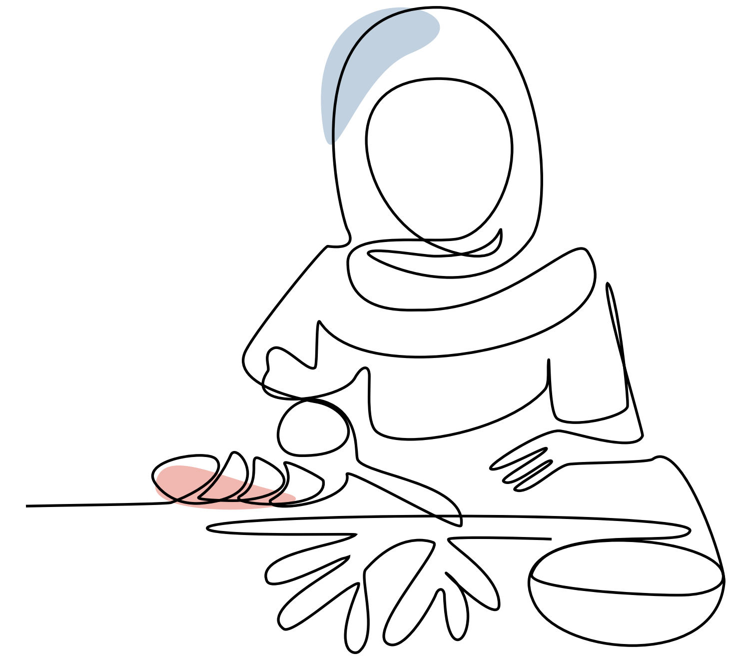


Figure 2.11 - Froebel Occupation : Cooking

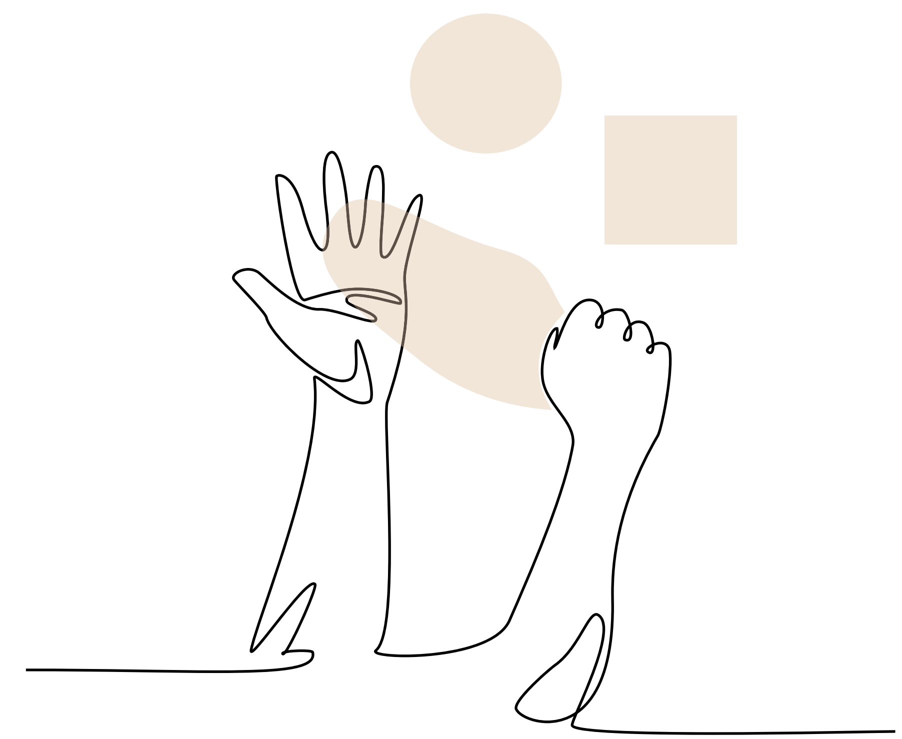


Figure 2.12 - Froebel Occupation : Playing with Clay

2.2 - EDUCATIONAL THEORY
2.2.2 - THEORISTS

MARIA MONTESSORI

Figure 2.13 - Montessori Stacking Toy
https://thewoodenwagon.com/woodentoy/BWS17.html

Figure 2.14 - Montessori Kitchen Set
https://www.etsy.com/dk-en/listing/752706746/kitchen-play-set-play-kitchen-wooden-baby

Figure 2.15 - Montessori Child-Sized Utensils
https://www.montessoriinreallife.com/home/2020/3/10/a-montessori-toddler-kitchen-part-ii

According to Aljabreen (2020) Lillard (2013) Maria Montessori was an educational theorist in the late nineteenth century. Her focus was her Montessori Method of Education – an approach to classroom learning that emphasizes and engages a child's independence and free will. The principles she follows reflect her teaching and the outcome the children receive. Through respecting the child, their mind, their sensitive periods, preparing the environment for the children to engage and learn with, the children are able to teach themselves with the independence given. The Montessori Method has the student at the center of the teaching and learning process, the instructors have the passive role – a mentorship role. The use of the Vygotsky's zone of proximal development is evident in the guidance the instructor gives the student, so the child has a very active role in their own education. Within the Montessori Classroom the structured child-sized design stimulates and engages the senses of the child through tactile, visual, and acoustical learning.

The child-sized ergonomics of the toys Montessori develops the child's gross and fine motor skills, their cognitive capabilities, and allows them to have the freedom to explore at their scale and pace. The classroom space is divided into sections of language, culture, arithmetic, sensory engagement, and practical life and arts. The classroom is structured in a way that the child has independence within a prepared environment – an environment meant to teach, not control.

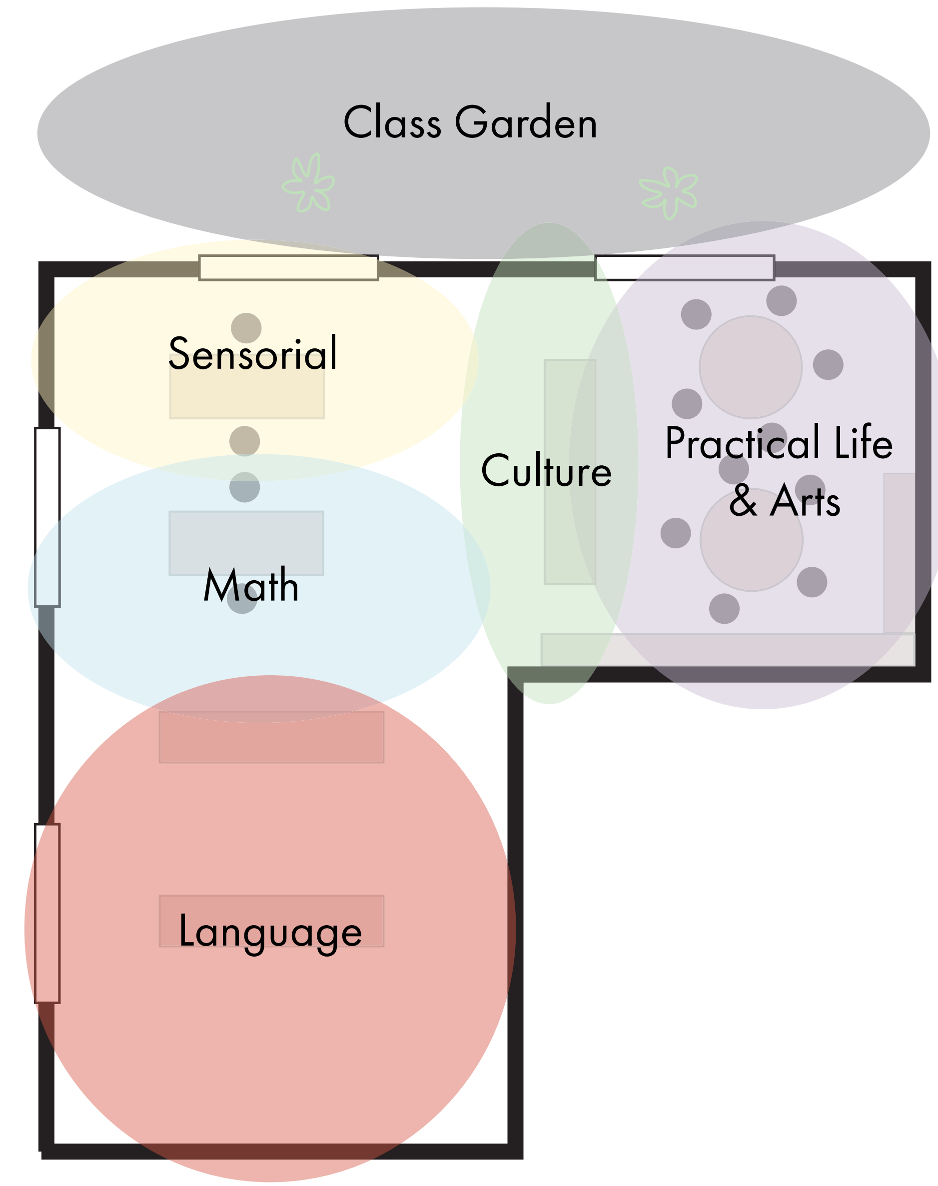


Figure 2.16 - Montessori Classroom

2.2 - EDUCATIONAL THEORY
2.2.2 - THEORISTS

JOHN DEWEY

KNOWLEDGE IN CHILDREN = HABITS + PEER DISCUSSION + INTERACTIVE + INTERDISCIPLINARY

Figure 2.17 - John Dewey Ideology

According to Williams (2017), John Dewey was an educational theorist during the early twentieth century. He is known as being the founder of Pragmatist theory, where the philosophy of our knowledge is connected to solving problems we have experienced. Pragmatism is a philosophical movement that encourages the teachings of solving problems in practical life, similar to Montessori's philosophy, although it is not believed that children construct their own knowledge. Pragmatists believe that children form habits that grow their knowledge. Dewey's principles of education include Learning By Doing, logical discussions between peers, interactive education, and an interdisciplinary education. These principles aid children is forming connections and create a community within the schools. Learning By Doing started a revolution that introduced hands on learning into the educational practice where the teachings are reflected within the society – showcasing the diversity and complexity of the society.

Dewey's focus for schools was to develop cooperative communities, help children find their full potential, and enhance the importance of engaging the child's senses as a contributor to the practice of education.

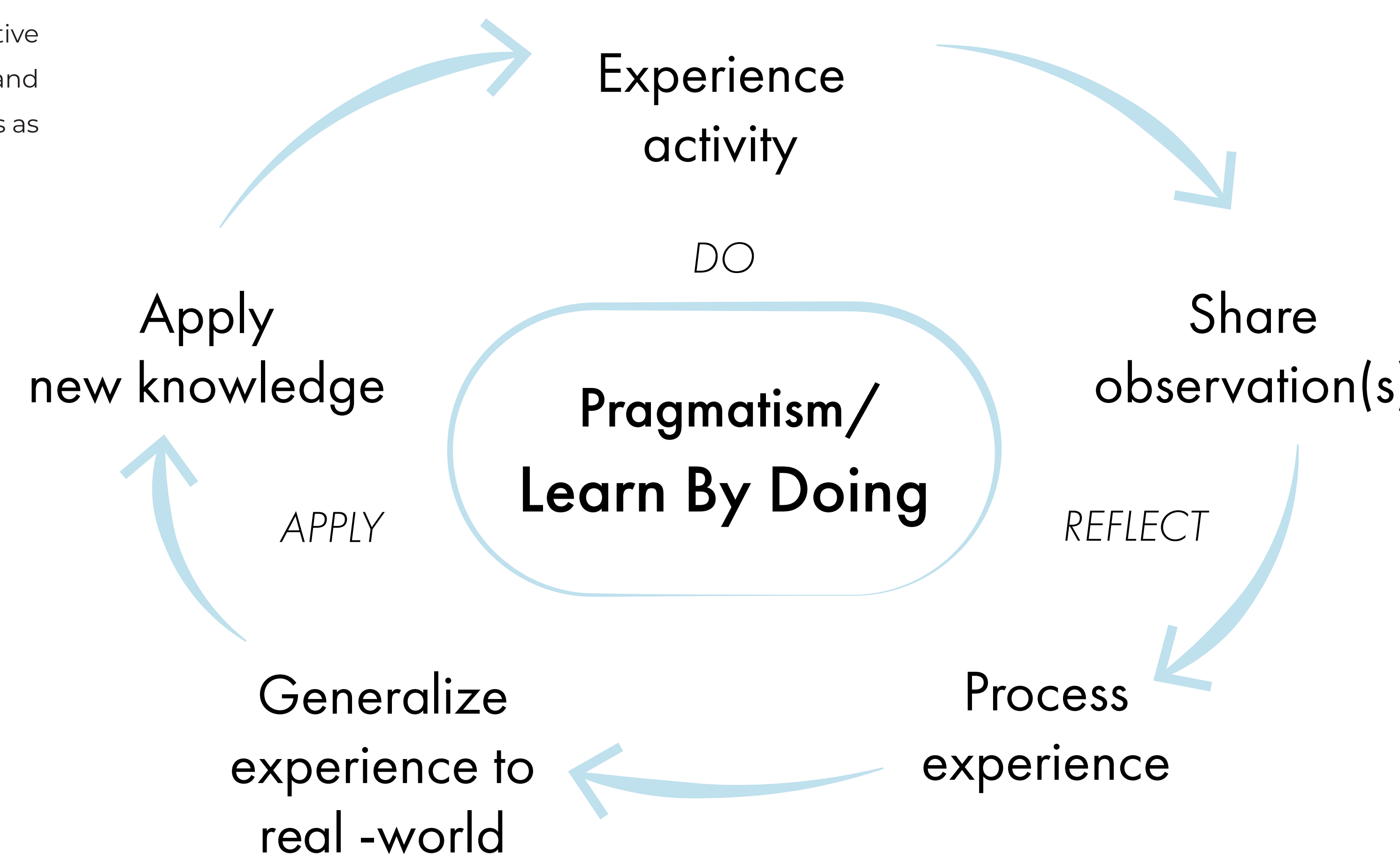


Figure 2.18 - John Dewey Pragmatism Diagram

2.3 - ARCHITECTURAL BASIS

2.3.1 - WHAT IS PLAY?

Play in architecture is engaging, flexible, interactive, reconfigurable, accessible, and attractive. The spatial environment of education is dictated by the type of education being taught. Looking at the history of schools, the traditional learning style of direct instruction used the architecture as a form of control that allowed for minimal or no free play. The standard schools of today in the United States are still following in the concept of using the architecture to control instead of the architecture being used as a learning tool, as the teacher. By analyzing floor plans, sections, and elevations I developed this idea of play as stated in the beginning. The architecture can be designed to create a playful and imaginative environment for the cognitive and educational development of the child.

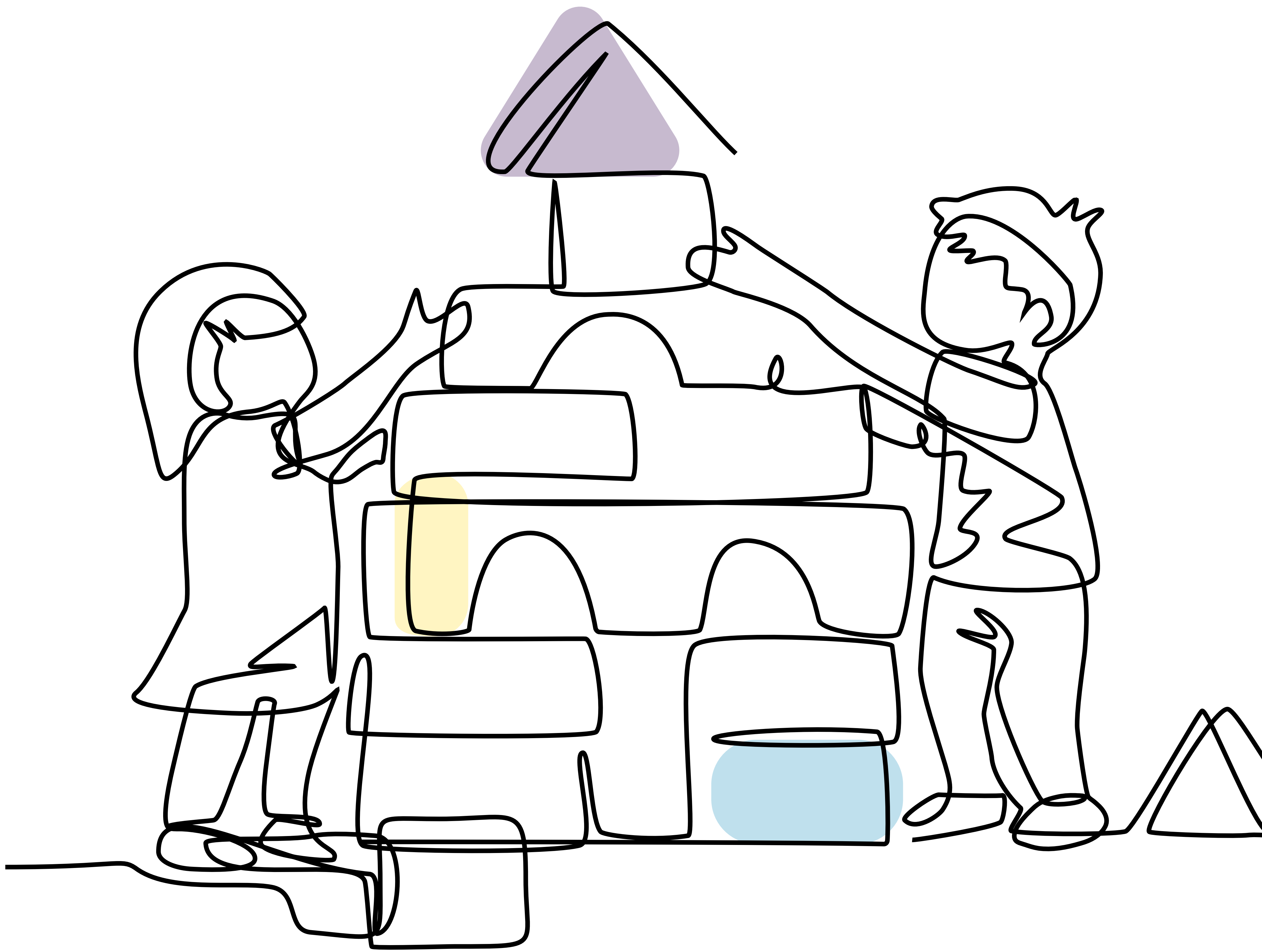


Figure 2.19 - Girl and Boy playing with Toy Building Blocks

2.3 - ARCHITECTURAL BASIS
2.3.2 - HISTORICAL ANALYSIS
HOUSE TO SCHOOL

House and Educational Architecture have developed parallel since the 18th century or earlier. The design of schools began with a single room design, like the mono-function model for the house - the single room house. Over time, the house began to break into areas of use with bedrooms and living or gathering areas to start. Prior to special areas beginning to arise in house designs, the rooms had no specific use. In that time period, around the 17th century, the school for the children “was the everyday world they inhabited” (Dudek, 2000, 6). As schools wer built specifically for teaching, the design began similar to the monofunction of the house - a single room. Cities with more dense populations had multiple rooms, all with the same purpose. The Factory Act of 1833 required two hours of daily instruction for factory children. The purpose of the daily instruction was to teach children order, proper morals, discipline, and control. The UK Elementary Education Act of 1870 made school a requirement for children aged 6 to 11 years. This Act required schools to be designed and built for the purpose of direct instruction. E.R. Robson was appointed as the architect intended to design the future schools. A few of his works are the Hatfield House - built in 1607-11 - and the Johnson Street Board School. Both are the later end of the parallel between house and school design. The Johnson Street Board School - built in 1873 - while more versitile than the previous single room school types, was still used to enforce control of the children by the isolated, direct instruction and isolation from the natural environment.

Figure 2.20 - House and School Plan Evolution

2.3 - ARCHITECTURAL BASIS

2.3.3 - FLOOR PLAN ANALYSIS

FLOOR PLAN ANALYSIS - SHAPES

Through the analysis if several school and playground floor plans, the findings reflect that playful space in architecture that is represented through floor plan by the shapes, axis' of circulation, the intersections, and the implicit space created through the architectural elements. The shapes analysis was confided to common sections of cluster shapes, overlapping shapes, void shapes, and organic shapes that creates school typologies that can be endeavored during the Spring semester.

CLUSTER

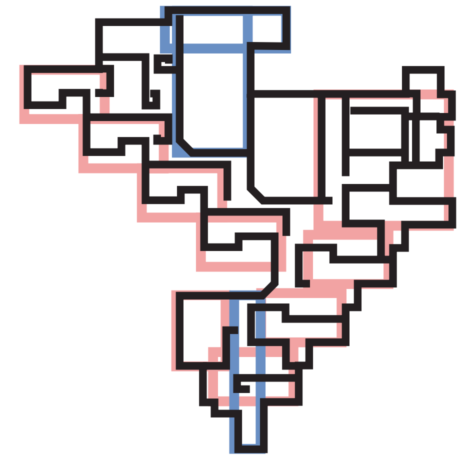


Figure 2.21 - Shapes of Aldo Van Eyck Orphanage

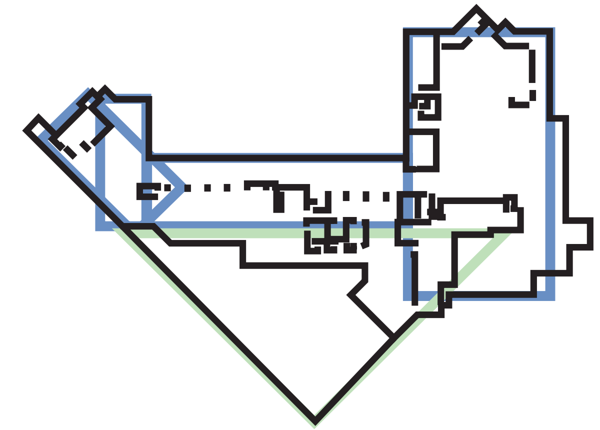


Figure 2.22 - Shapes of School at Taliesin by Frank Lloyd Wright

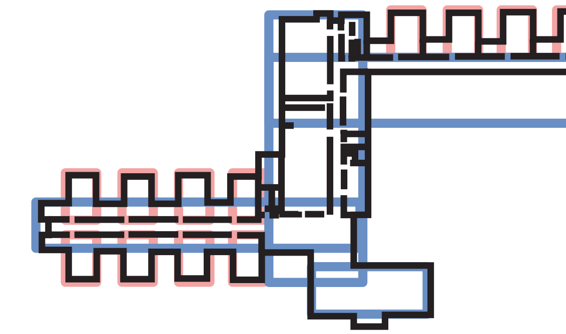


Figure 2.23 - Shapes of Crow Island School by Frank Lloyd Wright

OVERLAP

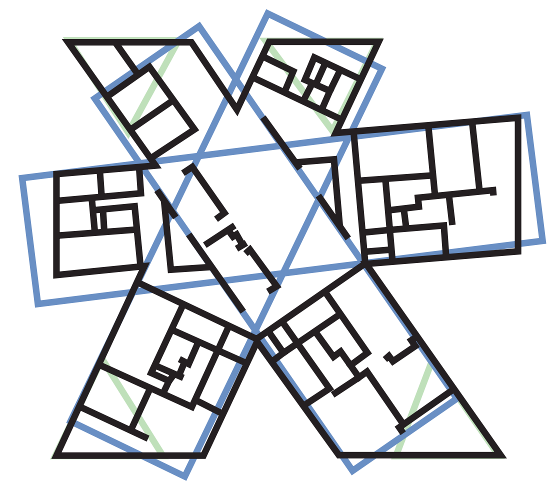


Figure 2.24 - Shapes of Kindergarten Lotte by Kavakava Architects

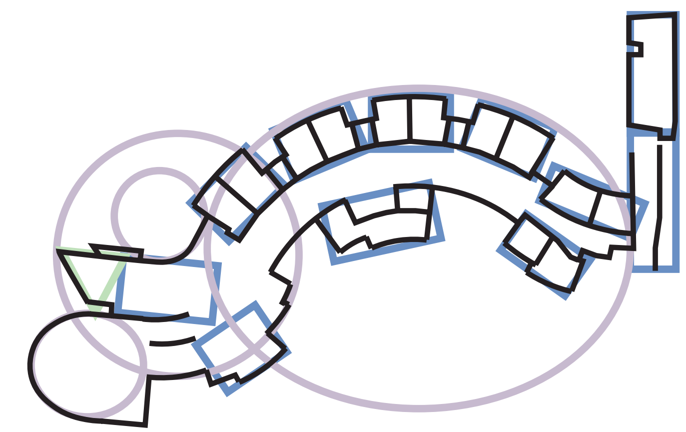


Figure 2.25 - Shapes of Hazelwood School by Alan Dunlop Architect

VOID

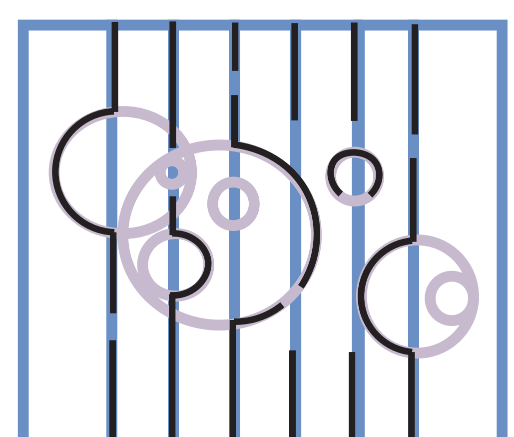


Figure 2.26 - Shapes of Sculpture Pavilion by Aldo Van Eyck

Figure 2.27 - Shapes of Heinz Galinski School by Zvi Hecker

2.3 - ARCHITECTURAL BASIS

2.3.3 - FLOOR PLAN ANALYSIS

FLOOR PLAN ANALYSIS - CIRCULATION + AXIS

The axis' of circulation analysis created typologies based on the common circulation axis' that were developed in plan view and grouped into linear, multilinear, centrifugal, and labyrinth axis' that create playful architecture and allow for further exploration to occur for developing a playful architecture for the practice of education, within the confides of my thesis.

LABYRINTH

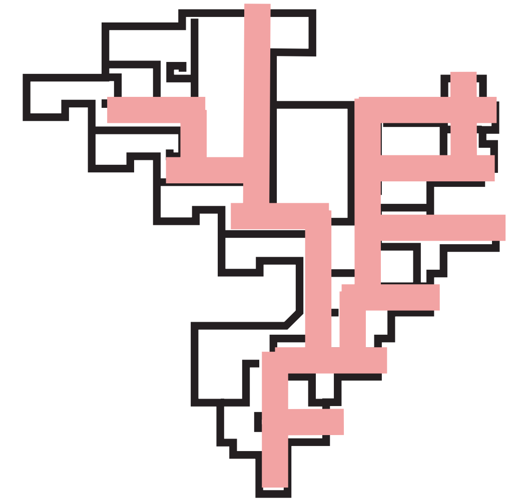


Figure 2.28 - Circulation of Aldo Van Eyck Orphanage

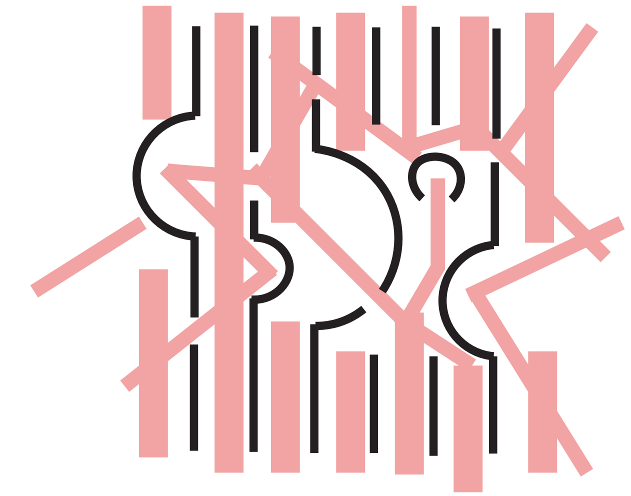


Figure 2.29 - Circulation of Sculpture Pavilion by Aldo Van Eyck

LINEAR

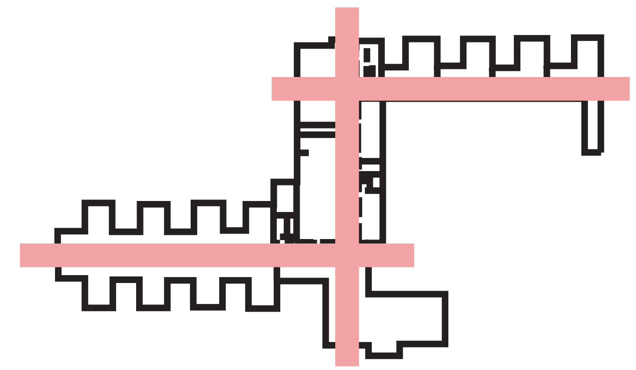


Figure 2.30 - Circulation of Crow Island School by Frank Lloyd Wright

MULTILINEAR

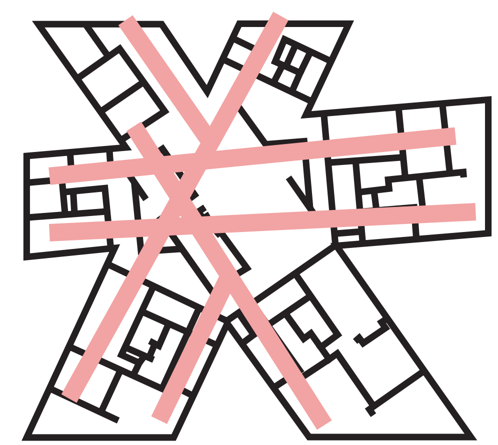


Figure 2.31 - Circulation of Kindergarten Lotte by Kavakava Architects

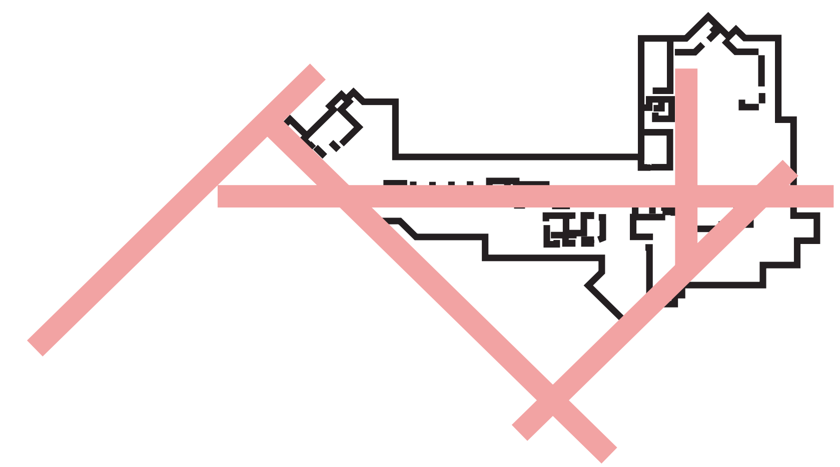


Figure 2.32 - Circulation of School at Taliesin by Frank Lloyd Wright

CENTRIFUGAL

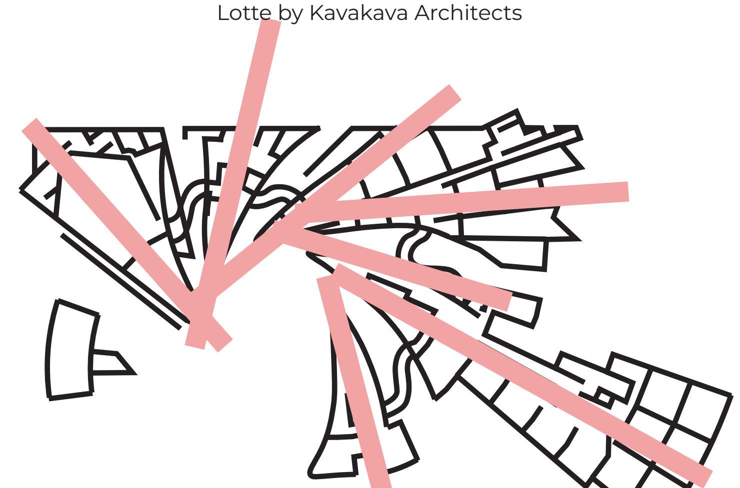


Figure 2.33 - Circulation of Heinz Galinski School by Zvi Hecker

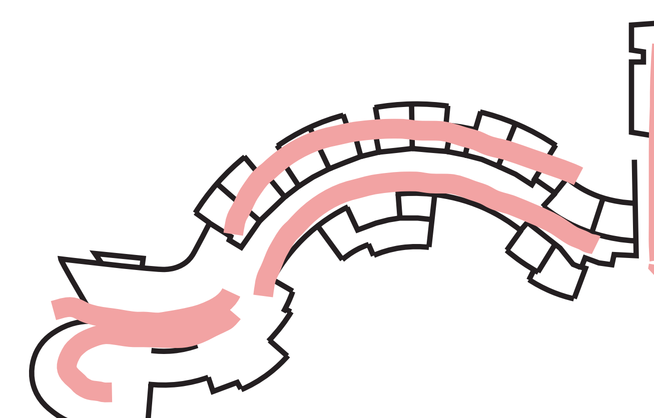


Figure 2.34 - Circulation of Hazelwood School by Alan Dunlop Architect

2.3 - ARCHITECTURAL BASIS

2.3.3 - FLOOR PLAN ANALYSIS

FLOOR PLAN ANALYSIS - INTERSECTIONS

The intersections of space are shown in these diagrams, where the space created from the overlap follow the axis of circulation. From this analysis I found that the intersections created a transitionary space that guides the user from various areas, a meeting place, or social area can be created in these overlapping areas of the floor plans. Areas of obvious intersection followed the circulation axis', showing the connections between the shapes and axis' of circulation analysis'. The analysis of implied space give information that was not provided by the architecture but was implied from the form and surrounding environment. Implied space in schools are typically used for play and outdoor learning, depending on the program.

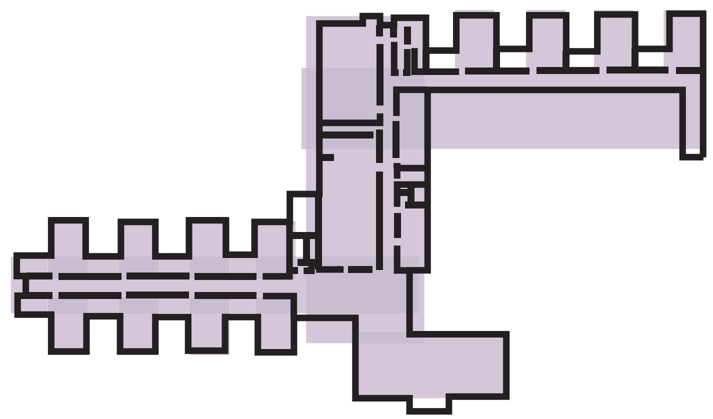


Figure 2.35 - Intersections of Crow Island School by Frank Lloyd Wright

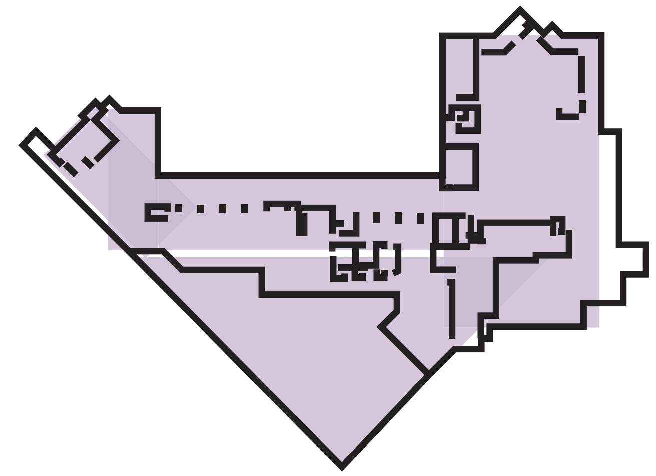


Figure 2.36 - Intersections of School at Taliesin by Frank Lloyd Wright

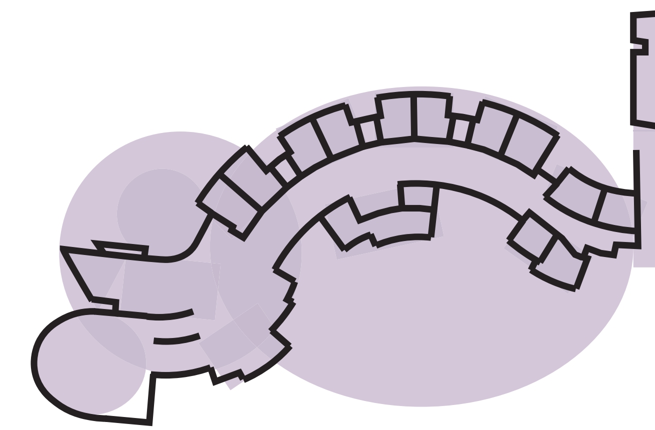


Figure 2.37 - Intersections of Hazelwood School by Alan Dunlop Architect

Figure 2.38 - Intersections of Heinz Galinski School by Zvi Hecker

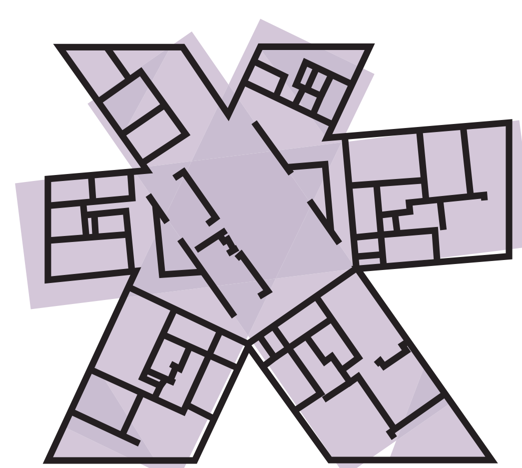


Figure 2.39 - Intersections of Kindergarten Lotte by Kavakava Architects

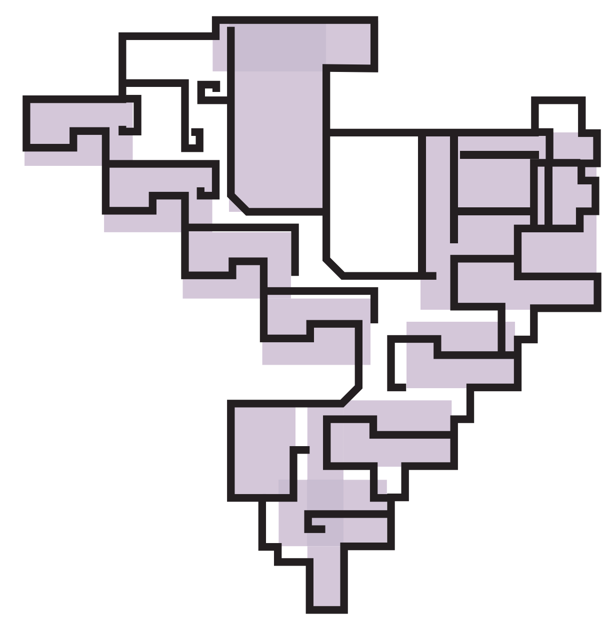


Figure 2.40 - Intersections of Aldo Van Eyck Orphanage

Figure 2.41- Intersections of Sculpture Pavilion by Aldo Van Eyck

2.3 - ARCHITECTURAL BASIS

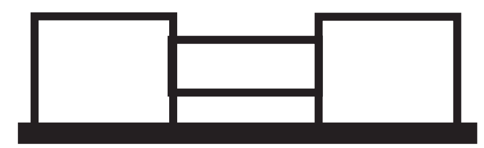
2.3.4 - ELEVATION/SECTIONAL ANALYSIS

ELEVATION/SECTIONAL STUDY

The sectional and elevation analysis of several schools and playgrounds segment the findings into sections that school typologies can fall into. Most commonly found is the single stack school, one floor with limited exploration of circulation. While the circulation has the opportunity to be playful in floor plan, the sectional and elevation analysis is mundane. Typologies found with this analysis that bring vertical or 3D circulation are stacking, bridging, blocking, and modular. These typologies can be applied to make a playful atmosphere through the various scales that each typology could be implemented on the interior and exterior of the architecture. Each is playful in their own right based on the program and teaching style that is being implemented.

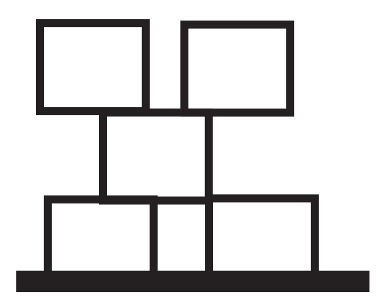
SINGLE

STACKING



BRIDGING

BLOCKING



MODULAR

Figure 2.42 - Crow Island School
https://www.claasshaus.com/blog/10-things-crow-island-elementary-school

Figure 2.43 - Hazelwood School
https://aasarchitecture.com/2016/09/hazelwood-school-glasgow-alan-dunlop-architect/

Figure 2.44 - Kindergarten Lotte
https://archello.com/project/kindergarten-lotte

Figure 2.45 - Upper Secondary School
https://divisare.com/projects/270735-a2f-architects-fmos-the-upper-secondary-school-in-mosfellsbaer

Figure 2.46 - Coleigio Dos Platano
https://www.metalocus.es/en/news/colegio-dos-platanos-murmuro-brick-a-stabilizing-element

Figure 2.47 - Integrative House for Children
Building to Educate by Sibylle Kramer

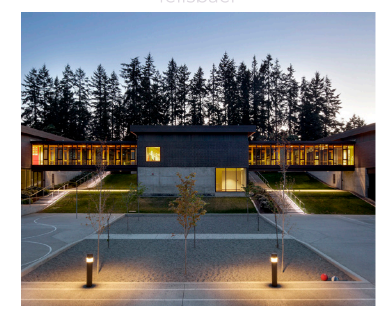


Figure 2.48 - Charles Wilkes Elementary
https://www.archdaily.com/596974/wilkes-elementary-school-mahlum/54d83dfbe58ece1912000145-2010603_08096_f_bittermann-jpg

Figure 2.49 - Heinz Galinski School
https://www.flickr.com/photos/doctorcasino/4924508156

Figure 2.50 - Ewing Marion Kauffman School
https://www.architecturalrecord.com/articles/11403-the-ewing-marion-kauffman-school

Figure 2.51 - School Center Mouriz
http://mrg.pt/en/portfolio/go/mrg-construction-ebi--ji-mouriz---mouriz

Figure 2.52 - 13 Class Primary School
https://www.archdaily.com/313339/13-class-primary-school-in-beausoleil-cab-architects/50e12065b3fc4b323000010d-13-class-primary-school-in-beausoleil-cab-architects-photo

Figure 2.53 - Poet Rachelle Primary School
https://www.archdaily.com/797029/kfar-saba-primary-school-regavim-plus-architects

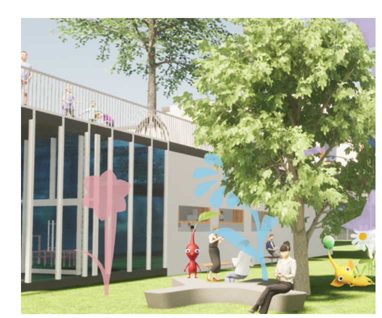


Figure 2.54 - Playful-School Park
Focus Studio Fall 2022

Figure 2.55 - 21 Atlantico Kindergartens
https://www.metalocus.es/en/news/modules-and-patterns-association-educational-architecture-21-atlantico-kindergartens-el-equipo-mazzanti

Figure 2.56 - Playground Kuni Park, Japan
https://www.play-scapes.com/play-design/modular-climbing-boxes-kodomo-no-kuni-park-yokohama-city-japan/

2.3 - ARCHITECTURAL BASIS

2.3.5 - PROGRAM ANALYSIS

PROGRAM ANALYSIS

The program focus in schools today are developing more student-centered foundations. The architecture is becoming reflective of that through the playful and engaging atmospheres. Traditional schools were designed based on the schoolhouse model (Dudek 2000), where the architecture was a means of control for the direct instruction method. The schools that developed from the traditional schoolhouse are known as egg-crate schools, the shape representing the name. The circulation is rigid, linear, and singular when compared to the student-centered typologies. The eggcrate schools were designed with the primary element of control (Dudek, 2000). Student-centered programs use the architecture as a medium to learn, for the children to engage with, play with, and learn from. These schools are more organic, dynamic, and vary in the circulation and design, creating a space for true educational exploration. Using the program of a school as a basis for design, the components of the program can be translated into architectural language. A prominent and important space is the collaboration space that is reconfigurable, open, flexible, a co-working space, and have varying axis' of circulation.

TEACHER CENTERED

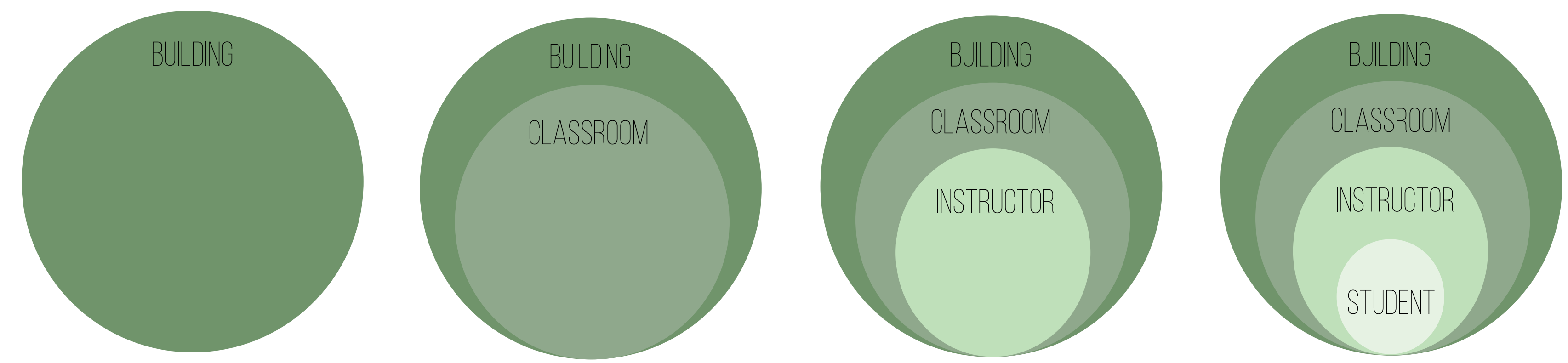


Figure 2.57 - Teacher Centered Learning Diagram

ARCHITECTURE AS A MEANS FOR CONTROL

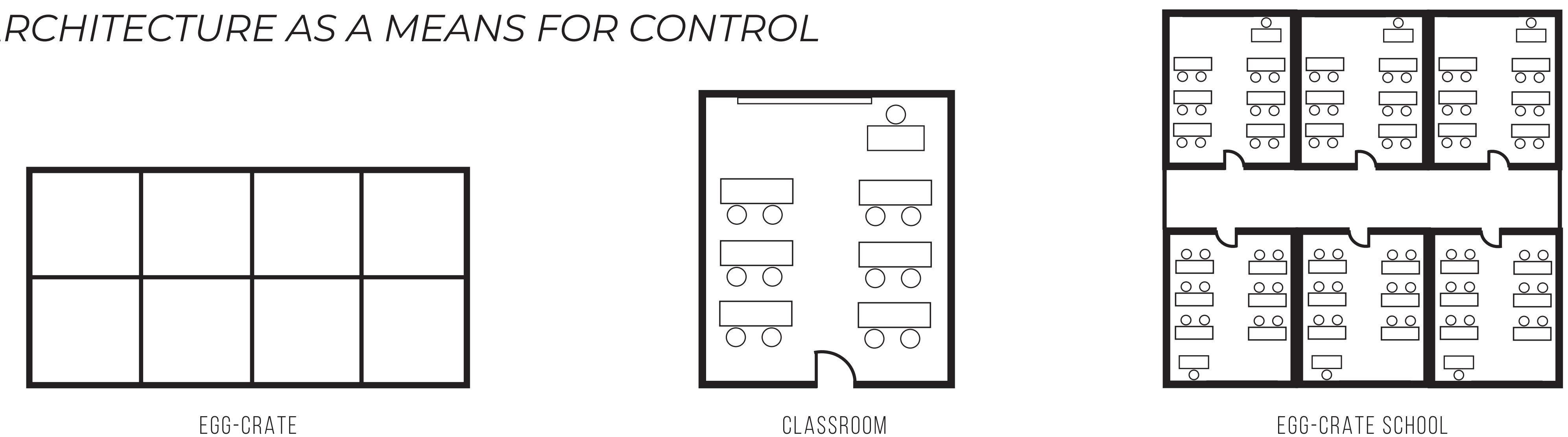


Figure 2.58 - Architecture for Control Diagram

STUDENT CENTERED

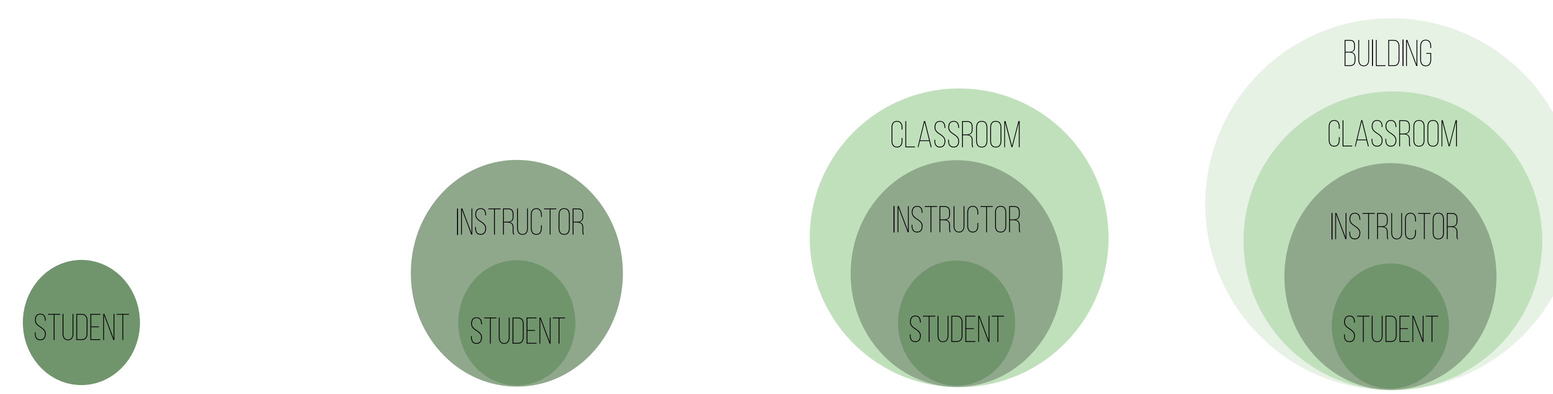


Figure 2.59 - Student Centered Learning Diagram

2.3 - ARCHITECTURAL BASIS

2.3.6 - CHILDREN'S EDUCATIONAL TOYS ANALYSIS

EDUCATIONAL TOY ANALYSIS

According to Ogata (2013), Children's Ergonomics is the optimization of the environment to engage a child and provide a comfortable space to play and learn. The use of child-sized toys encourages play for the children to make their own decisions and get an understanding of the complex world around them at their scale. Froebel's gifts are child-sized educational toys that benefit the child in their cognitive development and well-being. Montessori's toys include child-sized appliances such as forks, knives, spoons, pots, and dishes that teach the child practical daily skills like cleaning, cooking, and washing. Both Froebel and Montessori use natural materials and colors for their toys to engage the tactile and visual senses of the child. The House of Cards designed by Charles and Ray Eames and the Flexagons are both toys designed by architects and reflect the elements of reconfigurability, flexibility, and interactivity (Ogata, 2013, 56). In the further explorations for spring semester, I want to translate the concept behind the design of toys into architecture to create a playful learning environment.

I found that the primary principle of the learning application of these toys can be used during the design process. For educational toys the "objects required a physical response, thereby awakening the child's sensory facilities" (Ogata, 2013, 38). The learning applications from the toys are used to shape the child's perspective of the world around them and encourage a response to their environment - architecture can teach those principles as well through space and circulation.

ARCHITECTURE INSPIRED BY TOY PRINCIPLES

STACKING TOY - MONTESSORI

- BASIC SHAPES
- REQUIRE PHYSICAL RESPONSE
- PRACTICAL LIFE SKILLS
- NATURAL MATERIALS

Figure 2.60 - Montessori Stacking Toy
https://thewoodenwagon.com/woodentoy/BWS17.html

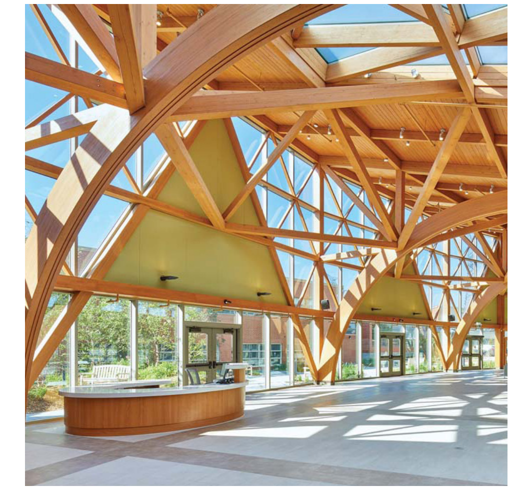


Figure 2.61 - Montessori School
https://www.canadianarchitect.com/forest-of-the-mind-toronto-montessori-school-richmond-hill-ontario/

HOUSE OF CARDS - EAMES

- DESIGNED BY ARCHITECTS
- COLORFUL
- RECONFIGURABLE
- FLEXIBLE

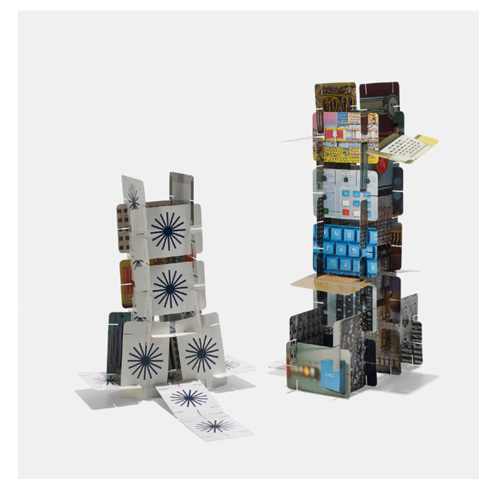


Figure 2.62 - Eames Card Game
https://vshopg.tk/products.aspx?c-name=eames+house+of+cards&cid=65

Figure 2.63 - Eames Pavilion
https://70n.no/Eames-pavilion-house-of-cards

FLEXAGONS - BASSETTI

- DESIGNED BY AN ARCHITECT
- RECONFIGURABLE
- BASIC SHAPES

Figure 2.64 - Flexagons
https://www.bassettiarch.com/milestones

Figure 2.65 - Bassetti Alphabeta Cube
https://wp.wwu.edu/wwuart109/2019/05/17/naturally-imperfect-a-reflection-on-fred-bassettis-alphabeta-cube/

2.3 - ARCHITECTURAL BASIS
2.3.6 - CHILDREN'S EDUCATIONAL TOYS ANALYSIS

CHILD TO ARCHITECT

From the influence of children's toys, there were a few well known architect's that flourished in their architectural style that have resemblance in the toys that they played with as a child. Froebel gifts had a large influence on the architectural style of several architects such as Frank Lloyd Wright, Le Corbusier, and Buck Minister Fuller. Froebelian ideology about teaching children about shape and form and making connections aided in the development of several other children's toys that are still around today - Legos, Tinker Toys, etc. The influence of Froebel created a system that is used today when developing new children's toys, a precedent for the future of children's toys. While Froebelian ideology was developed for shaping children's mind, the Bauhaus design school, founded by Walter Gropious, used the ciriculum of the Kindergarten to shaped the minds of the future of designers. The Bauhaus ciriculum follows the ideals of modernism with high influence from Frank Lloyd Wright and Froebel's pedagoy (Kohlstedt, 2019).

FROEBEL GIFT

ARCHITECT'S WORK

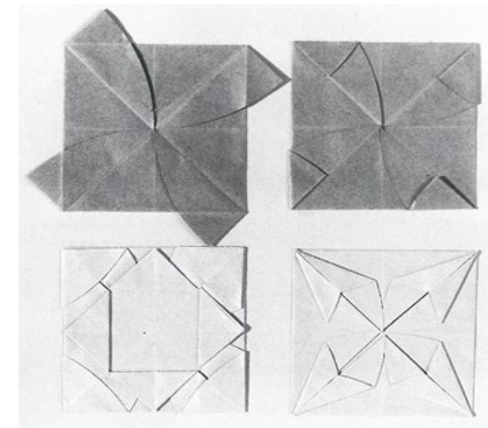


Figure 2.66 -Froebel Gift #18
https://99percentinvisible.org/episode/froebels-gifts/

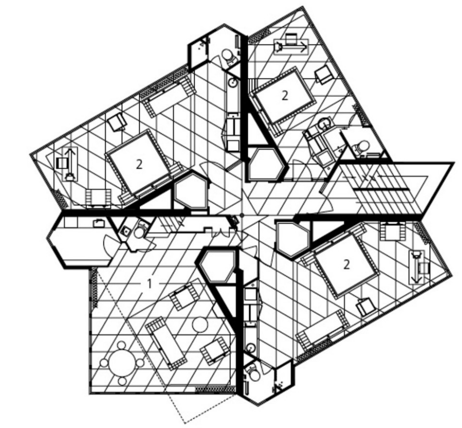


Figure 2.67 -Price Tower by Frank Lloyd Wright
https://discover.hubpages.com/travel/FrankLloydWrightPriceTower

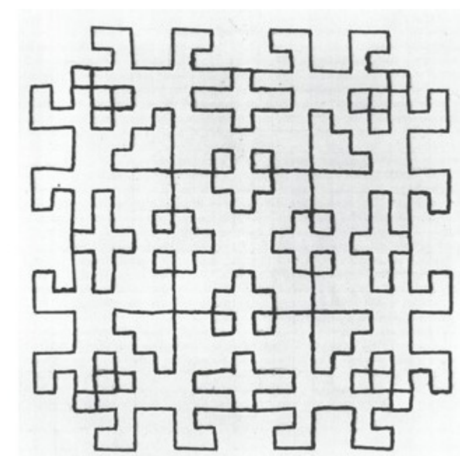


Figure 2.67 -Froebel Gift #10
https://99percentinvisible.org/episode/froebels-gifts/

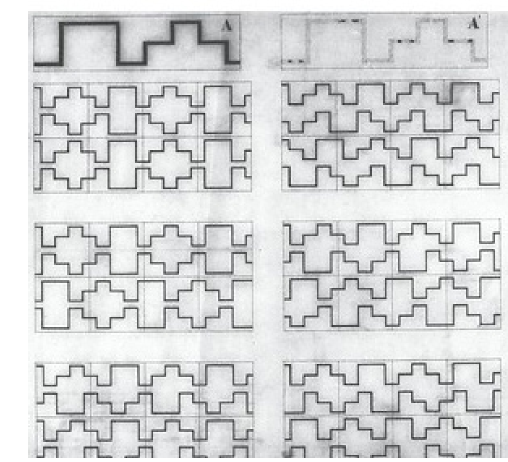


Figure 2.68 -Monderist Housing Grids by Le Corbusier
https://99percentinvisible.org/episode/froebels-gifts/

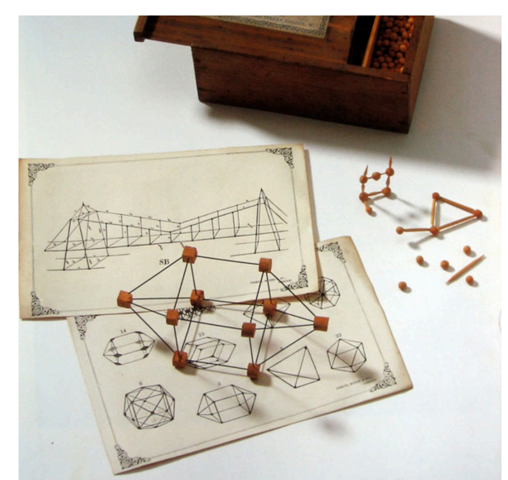


Figure 2.69 -Froebel Gift #19
http://wisdomofhands.blogspot.com/2015/11/peas-work.html

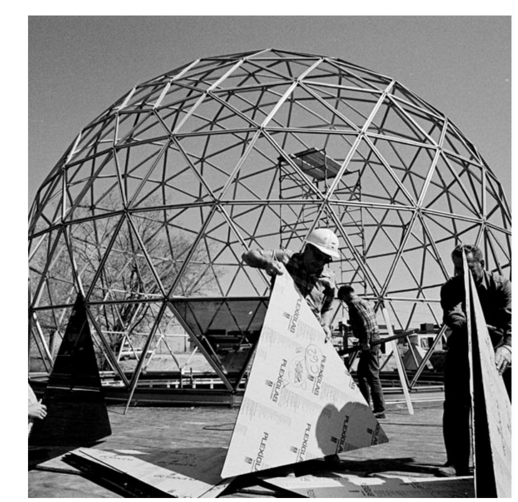


Figure 2.70 -Geodesic Dome by Buckminister Fuller
https://www.fullerdome.org/the-dome

2.4 - RESEARCH CONCLUSION
2.4.1 - RESEARCH CONCLUSION

The extensive research that was done for this thesis used the methodology of molding architecture, psychology, and educational theory into a message for more playful learning environments for children. Play is a vital piece of childhood and the growing mind. Rather than passively absorbing knowledge, children can construct their own knowledge through play as the medium. Through the theorists exploration, the understanding of the importance of a child's cognitive development is shown that both social and physical environments are required for the healthy growth of a child's cognitive processes and understanding of the environment around them. Play is a social concept that is able to develop a child's language, perspective, and knowledge. Piaget and Vygotsky contributed to the understanding of a child's mind. Moving forward, these findings can be applied to the educational theories that Froebel, Montessori, and Dewey use to develop the complex concept of the best path a child needs to learn. These theorists in the progressive movements within the practice of education today. They brought to light the importance of developing an education for the child versus developing an education for the society. The use of play in all of their theories exemplifies the importance playing has on a child's cognitive and educational growth. Play, when used in educational practice, has shown to improve the child's awareness of self and relationships, independence, creativity and imagination skills, social language and behavior, and their gross and fine motor skills. The enjoyment from play stems from its uncertainty in the outcome of the child's behavior, it draws a border between normal and imaginative life.

Learning is a dynamic process that requires a dynamic relationship to establish a strong educational foundation for children, play is a solution to the broken dynamic in the schools of today. Limitations within play can be both physical and temporal, as translated in architecture, specifically architecture for educating. My thorough analysis of educational architecture found that playful spatial elements are introduced through the axis' of circulation, through 2D and 3D circulation explorations. Playful spaces are engaging, interactive, flexible, have varying axis', and use the senses to incorporate the child into the space where they can learn and grow in their cognitive and physical capabilities. The importance of playful architecture in education is to promote an education that the society will reflect in the future. "What values from our homes, our communities and our democracy do we wish to communicate to children through architecture, both overtly and symbolically? What is the reality of the child's experience?" (Dudek 2002). The relationship between the program of a school and the architecture of the school intersect regularly. The program of educational facilities has been focused more on the teacher than the student. The architecture has begun to reflect that where playful educational spaces are becoming more prevalent. The program determines the design in most educational spaces where children have begun to have more of a priority in the decisions behind how the schools are designed. A educational program centered for children is reconfigurable, open, flexible, and has varying axis' of circulation. Within the program of the educational space are elements that are directly tailored for children - at the scale of children. Children's ergonomics provides comfortable spaces for children to play and learn simultaneously. The use of Froebel's gifts, Montessori toys, etc. have principles within the application of the toys that are able to be used within design that can positively impact a child's perception of their learning environment. Examples of architects that have been impacted by these educational toys are Frand Lloyd Wright, Le Corbusier, and Buckminister Fuller. These architects are evidence of how educational toys or playful learning during childhood can greatly and positively impact the future of architecture.

SUMMATION

- Rather than passively absorbing knowledge, children can construct their own knowledge through play as the medium to aid in healthy cognitive growth.
- Play improves the child's awareness of self and relationships, independence, creativity and imagination skills, social language and behavior when using it as a medium to teach.
- Playful spaces are engaging, interactive, flexible, have varying axis', and use the senses to incorporate the child into the space where they can learn and grow in their cognitive and physical capabilities.

CHAPTER THREE

DESIGN PROCESS

3.1 - SIMPLE SHAPES EXPLORATIONS
3.1.1 - 2D SQUARE EXPLORATIONS

DESIGN EXPLORATION

How can an elementary form be playful?
To start the design process, I started with 2D explorations of space. I used a square because it is an elementary form that children learn during the preoperational phase and it follows what children typically learn during that age range according to the research from Piaget. To be playful with 2D space I did two explorations with subtracting space and adding space. The playfulness of this exploration is shown through the elements of space that is created from using other elementary forms such as circles, rectangles, and triangles to add or subtract space. The possibilities of the spaces that can be created from this exploration are limitless - these are a handful of the beginning design explorations for this thesis.

Following the process of the 2D explorations, I did 3D explorations with cubes using the results from the 2D explorations. The spaces created from having void space or additional space became more playful in the 3D realm. The play happened with the scale, height, and placement of the various volumes. The creation of voids in the 3D exploration gave the result of what space can be created both inside and outside the primary form of the cube. Using the criteria created from the research in Chapter Two, the lens was placed on seeing these forms through the shapes, circulation, and intersections that are formed from this 3D playful exploration of the cube and the following explorations.

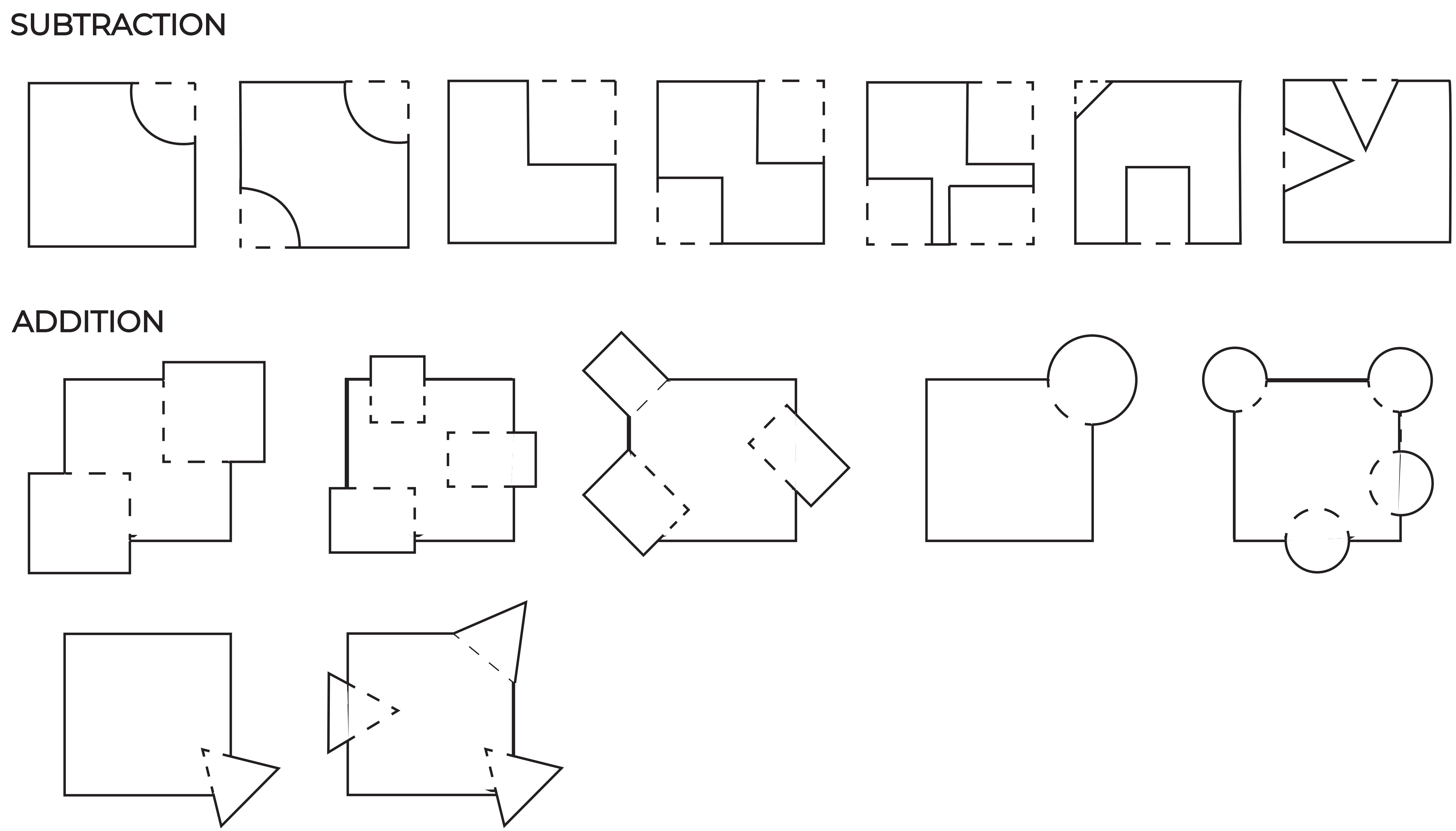


Figure 3.1 - 2D Design Explorations

3.1 - SIMPLE SHAPES EXPLORATIONS
3.1.2 - 3D SQUARE EXPLORATIONS

DESIGN EXPLORATION

VOID SPACE

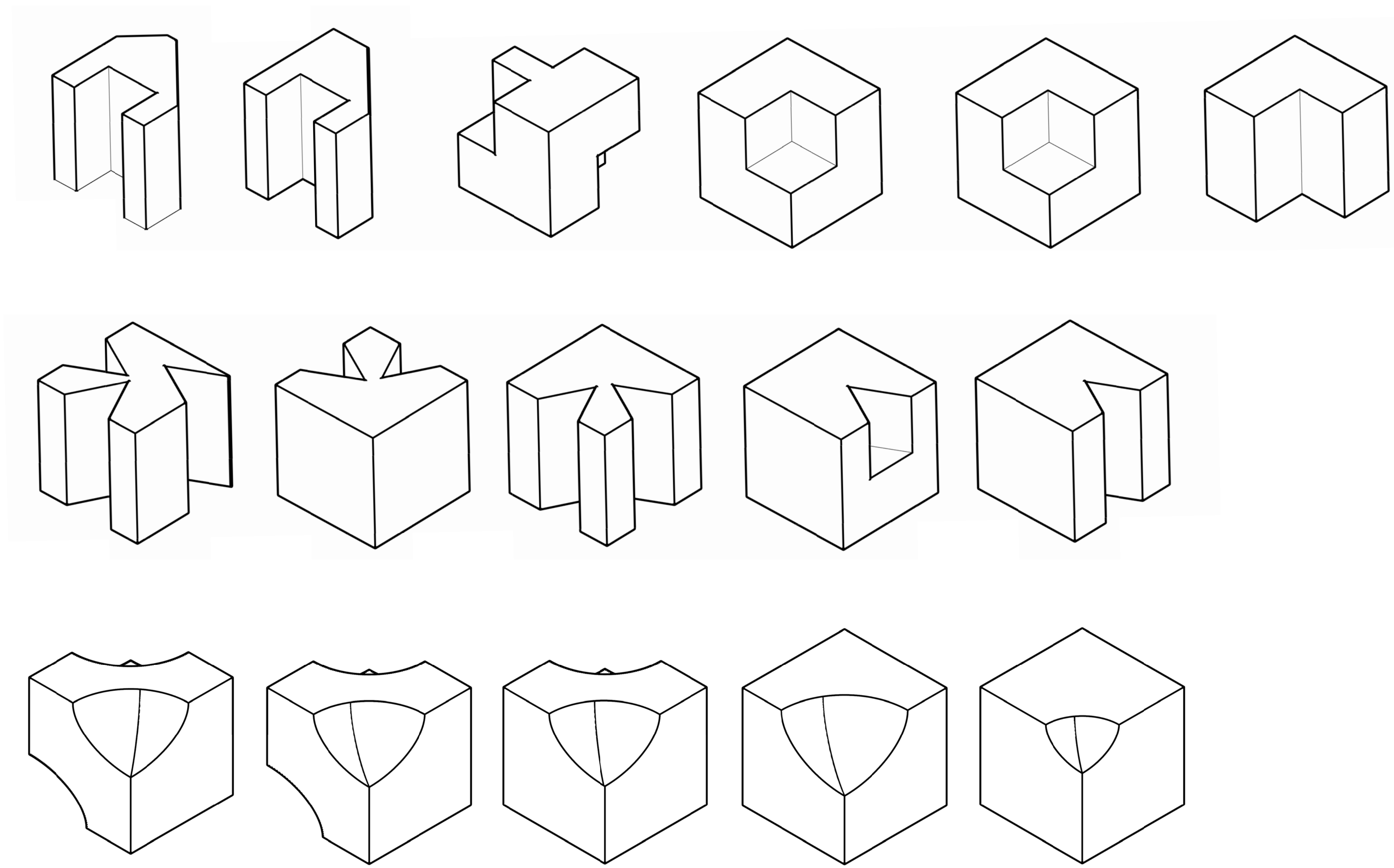


Figure 3.2 - 3D Design Spatial Void Explorations

3.1 - SIMPLE SHAPES EXPLORATIONS
3.1.2 - 3D SQUARE EXPLORATIONS

DESIGN EXPLORATION

ADDITIONAL SPACE

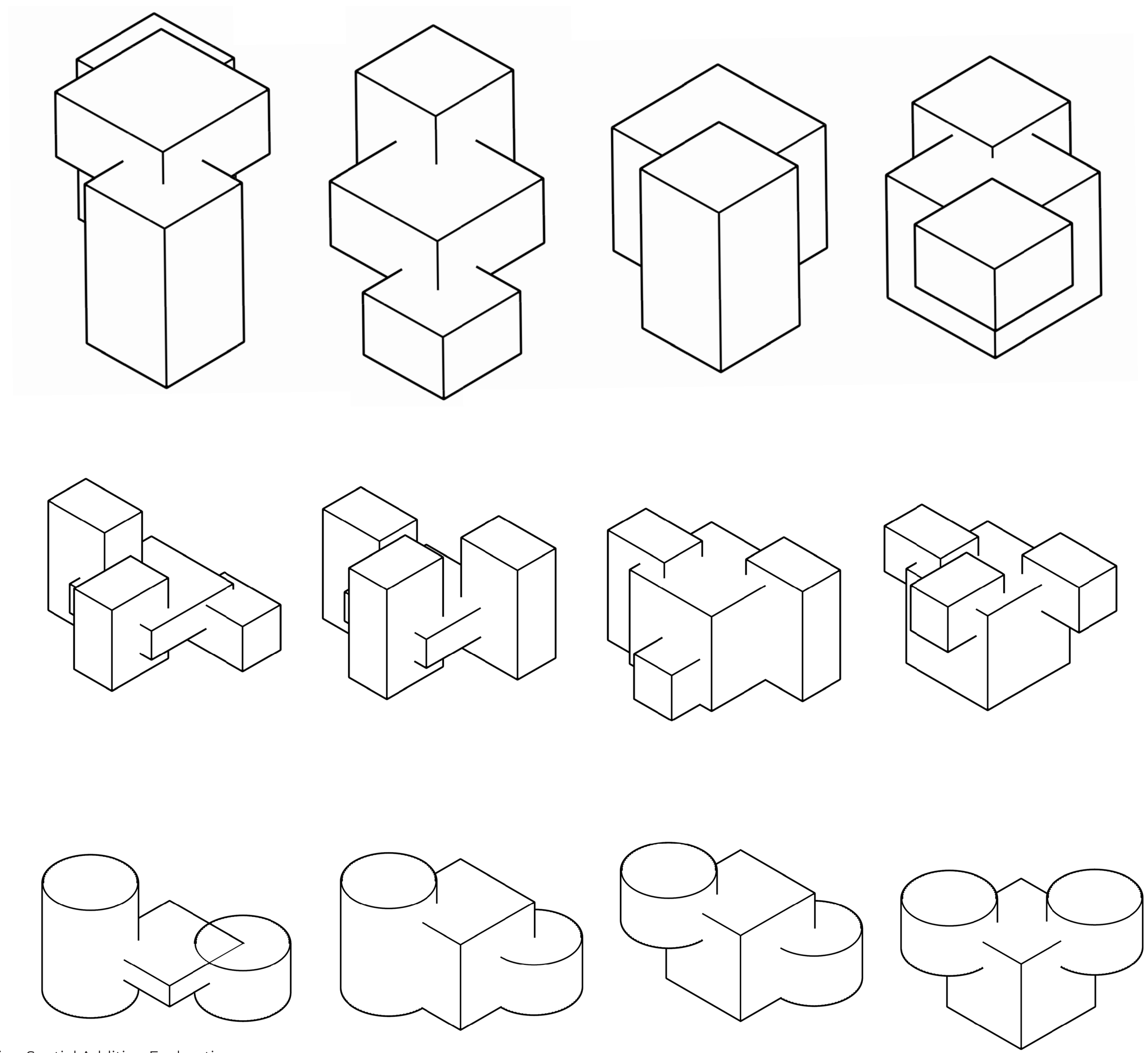


Figure 3.3 - 3D Design Spatial Addition Explorations

3.2 - CHILD'S GAME EXPLORATIONS
3.2.1 - ALDO VAN EYCK CASE STUDY

CASE STUDY
ALDO VAN EYCK SCULPTURE PAVILION

Aldo Van Eyck was an Architect in the 20th century in Amsterdam, Netherlands. His approach is based on structuralism; that the human mind is pre-programmed with simple geometric elements and we think by configuring these basic elements. For this case study of the Sculpture Pavilion I am analyzing the design principles that Aldo Van Eyck uses for any design at any scale. He was inspired by the paintings of Richard Paul Lohse in his establishment of his "ordering principles" (McCarter, 2015, 56). These principles are what I am using to analyze the Sculpture Pavilion and place the principles in the design strategies for educational spaces. The principles are "elements as boundaries defining space, rather than objects; the delimitation of space by elementary forms; the search for dynamic space within the orthagonal grid; the creation of shifting center by use of cetrifugal pattern; the establishment of nonhierarchical cohesion between various centers - polycentric orders" (McCarter, 2015, 51). In discussing his architecture, I would articulate the use of of basic geometry, then configurations of those elements on a grid to create maze and hierarchy. That is why his design is intelligible but allows for explorations and differences, hence playful.

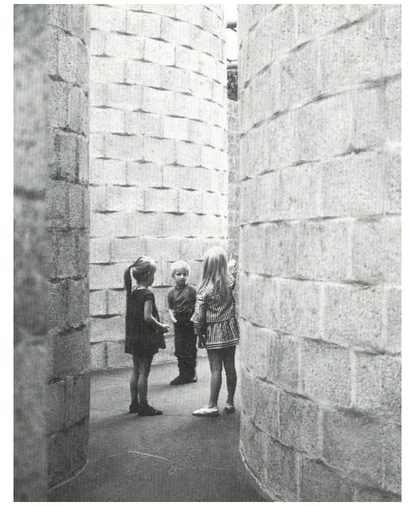
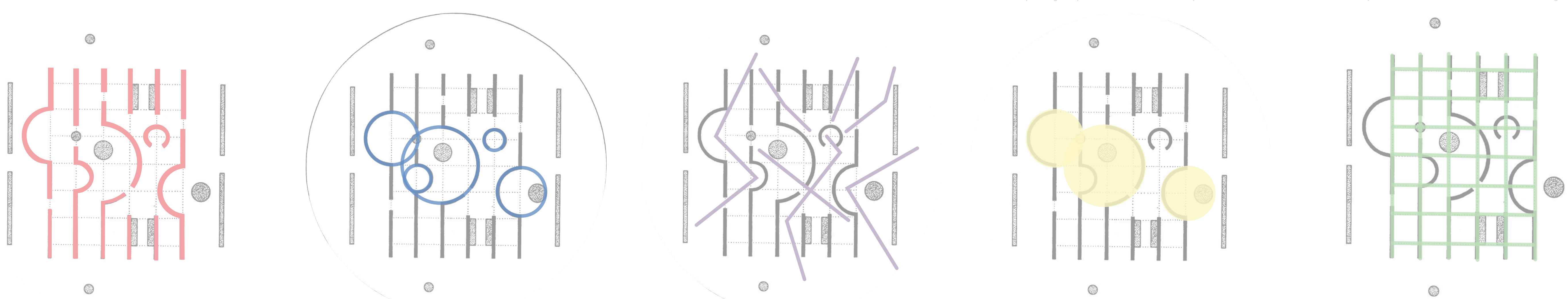


Figure 3.4 - Children Playing in Sculpture Pavilion
www.ndfjdkrei.top

Figure 3.5 - Perspective of Sculpture Pavlion

Figure 3.6 - Sculpture Pavilion Interior
https://ryanpanos.tumblr.com/post/67492967314/sonsbeek-pavilion-in-arnhem-aldo-van-eyck

Design Principles



Boundaries Defining Space

Delimination of Space by Elementary Forms

Shifting Center by Use of Centrifugal Pattern

Polycentric Centers

Orthagonal Grid

Figure 3.7 - Aldo Van Eyck Design Principles

3.2 - CHILD'S GAME EXPLORATIONS
3.2.2- HIDE AND SEEK ANALYSIS

DESIGN EXPLORATION

Aldo Van Eyck's Sculpture Pavilion, when analyzed in the spatial realm releases criteria that is playful and allows free exploration within the labyrinthing spaces found within. Using the Sculpture Pavilion as a case study for playful space was key for the use of the maze-like labyrinth that occurs with the ability to wonder and play to your freedom. The use of elementary forms for contrasting open and semi-enclosed space allowed for the playful circulation to be effective to use as a design strategy exploration and analysis. This analysis gave insight to how space can be playful with simipilicity. The game Hide & Seek has constraints of needing space to hide and needing paths to seek. Through this analysis I found that implied space has a great role in what can make a space playful. Partial enclosure allows children to learn and practice mental representation of basic geometric shapes.

Figure 3.8 - Hide and Seek Plan #1

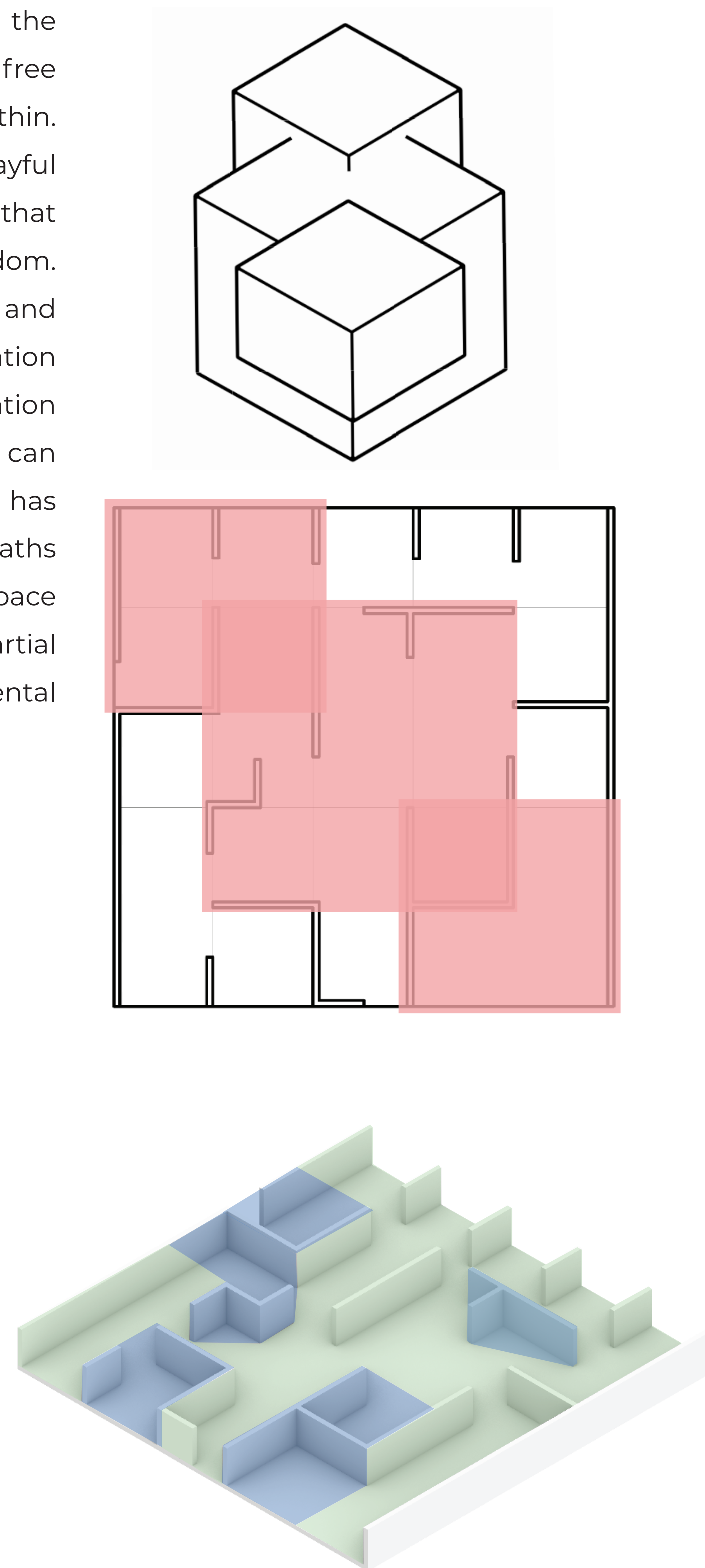


Figure 3.9 - Hide and Seek Plan #2

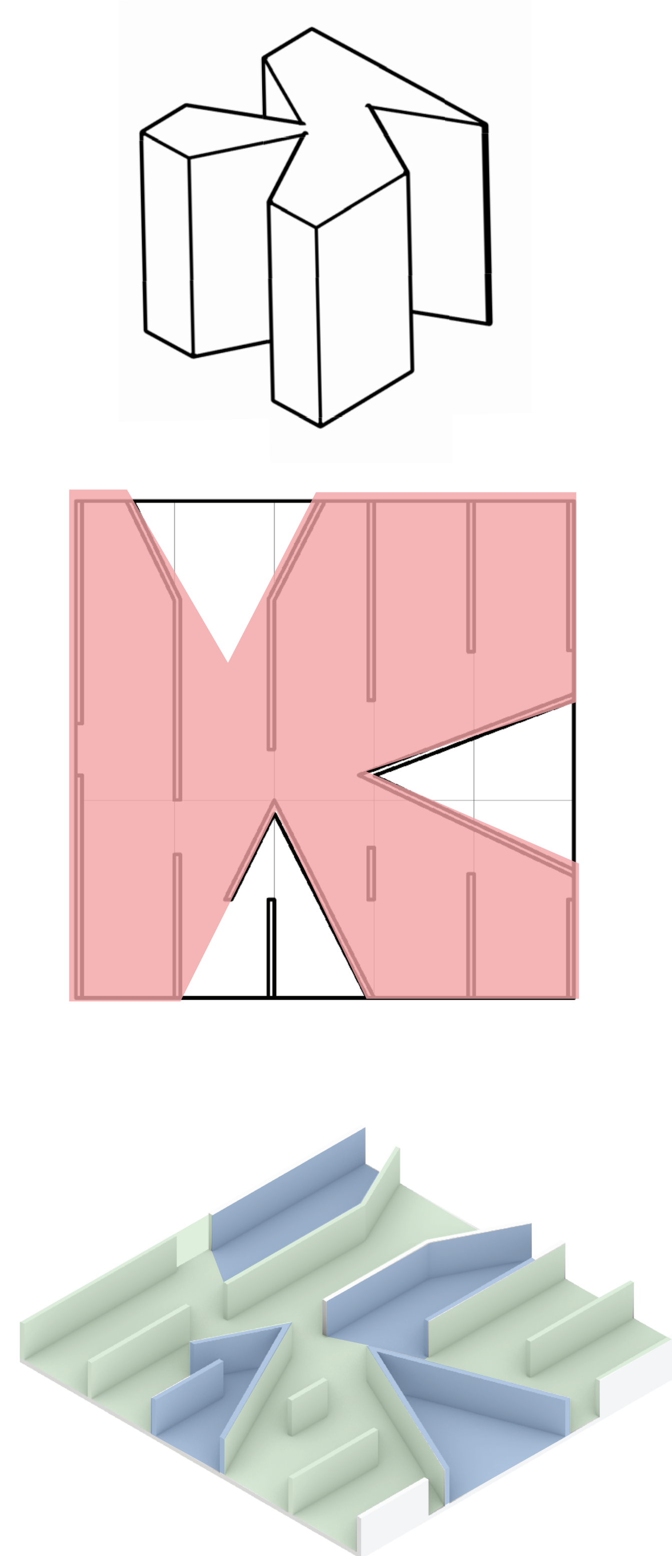
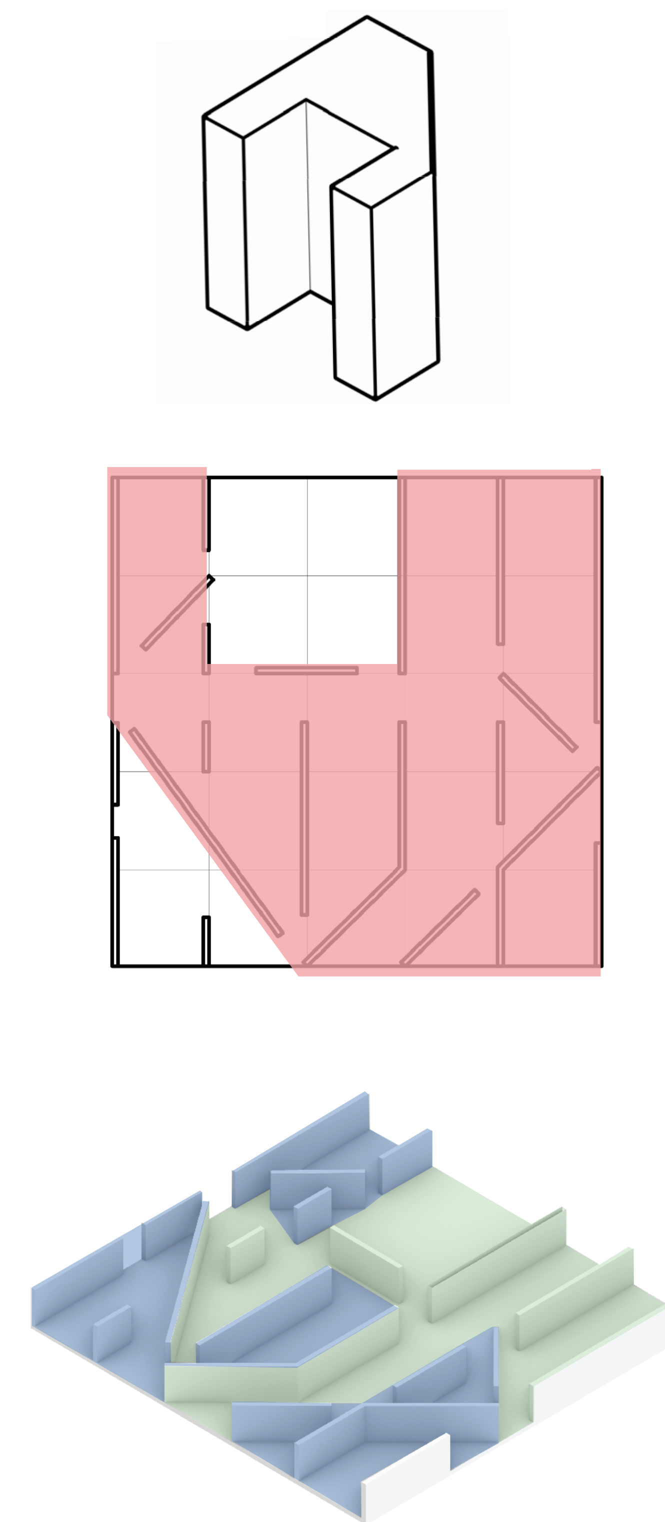


Figure 3.10 - Hide and Seek Plan #3



Plan view of 2D exploration

Statc space for hiding

Dynamic space for seeking

3.3 - CHILDREN'S TOY EXPLORATIONS
3.3.1 - MONTESSORI STACKING TOY

DESIGN EXPLORATION

Montessori Stacking Toy was one of the three Children's Educational Toys that I chose to use in the educational toy design exploration. The methodology for the educational toy explorations is to use the toys to find variations of playful yet simple space that can be created and learnt from. All the educational toys chosen are basic elementary shapes in the primary element - this one uses a circle. I used the circle to explore how space can be defined and created in various ways. The end result from each of these explorations is to find the primary design principles from the space created from abstracting and reconfiguring the educational toy.

The design principles found from this exploraiton are the elementary shapes that define the space and that are defined within the created space, the natural color and material of wood that Montessori uses for the toys she developed, and the configurability that is possible from these design explorations.

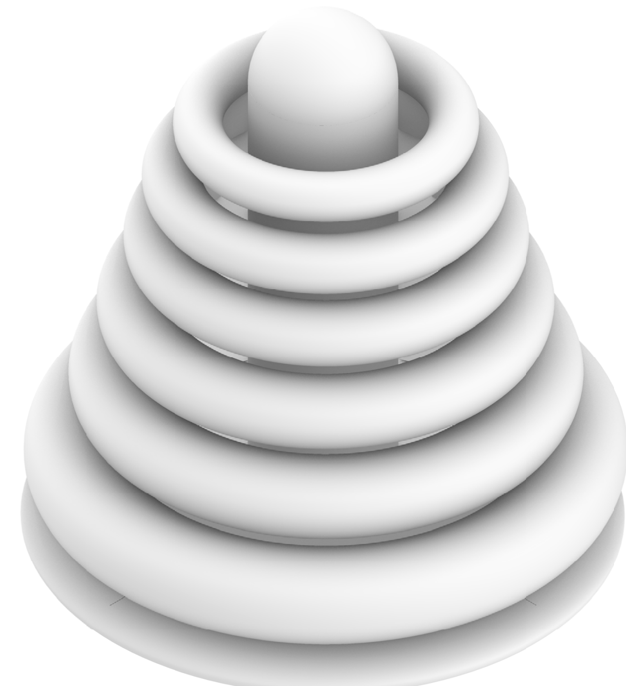


Figure 3.11 - Stacking Toy Isometric

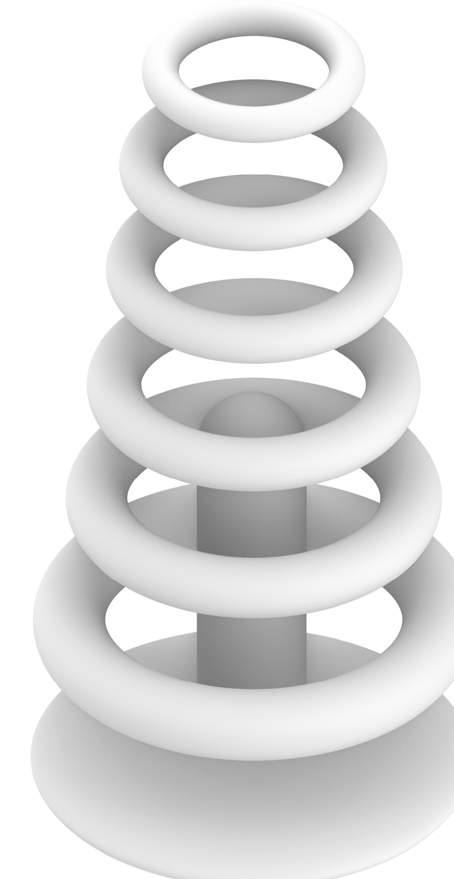


Figure 3.12 - Stacking Toy Exploded Isometric

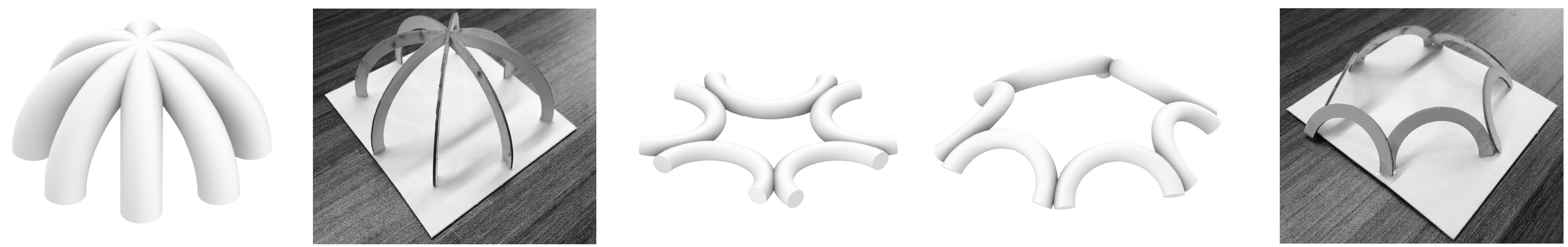


Figure 3.13- Stacking Toy Spatial Reconfiguration

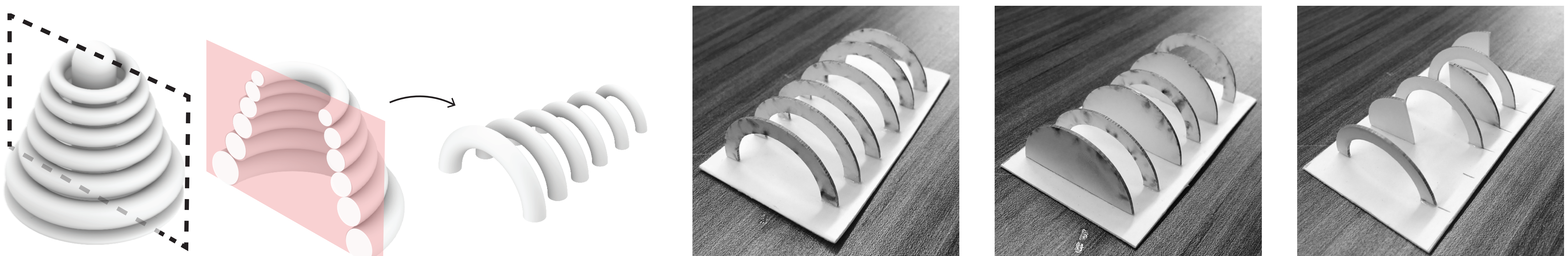


Figure 3.14 - Stacking Toy Reconfiguration

3.3 - CHILDREN'S TOY EXPLORATIONS
3.3.2 - FROEBEL BLOCKS

DESIGN EXPLORATION

Using Froebel Blocks for a design stratedy exploration with educational toys was perfect for an architectural project. Following the role of the famous architects that used Froebel's gifts during their childhood, these explorations play a crucial role in the elements of playfulness in educational design for children. The methodology for the educational toy explorations is to use the toys to find variations of playful yet simple space that can be created and learnt from. The elementary shapes used in the Froebel Blocks gift is a square. Although I did 2D and 3D explorations with squares and cubes, I approached this exploration with the intent of defining space using the form given from the blocks.

The design principles found from this exploration are the use of implied space to teach children about elementary forms through the basis of the void and addition exploration - primariy the exploration of voids in 3D to define space, the shapes/basic forms that is defined by the space created from the blocks, and the use of order - whether it be numerical, categorical, etc.

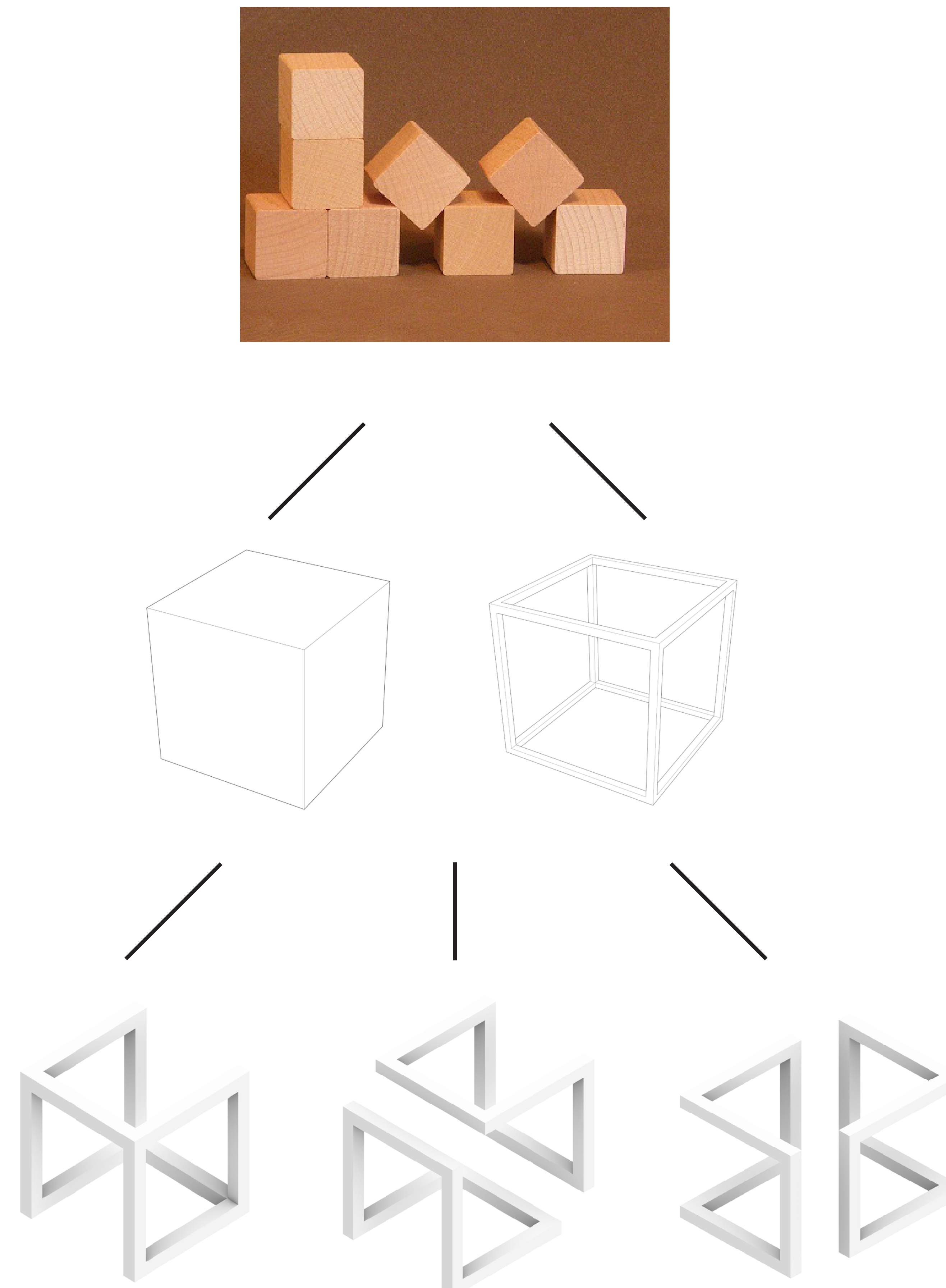


Figure 3.15 - Froebel Block Module Development

3.3 - CHILDREN'S TOY EXPLORATIONS
3.3.3 - RUBIK SNAKE

DESIGN EXPLORATION

Similar to the intent of Froebel's Blocks, the Rubik Snake was chosen due to the elementary forms that the toy is defined by - triangles. The methodology for the educational toy explorations is to use the toys to find variations of playful yet simple space that can be created and learnt from. The playfulness of this toy is shown through the modular and configurable pieces that make the whole. For this exploration I found a configuration called The Braid that showcases the elementary form of the triangle, although a bit more complex than the previous explorations for educational toys.

The design principles found in this exploration are the use of repetition for the module - Figure 3.17, the use of volume from the space defined by the skeletal module where the shapes are implied at a different scale based on the elementary form than the Froebel Blocks, and the modular elements that allow for this exploration to be reconfigurable and playful.

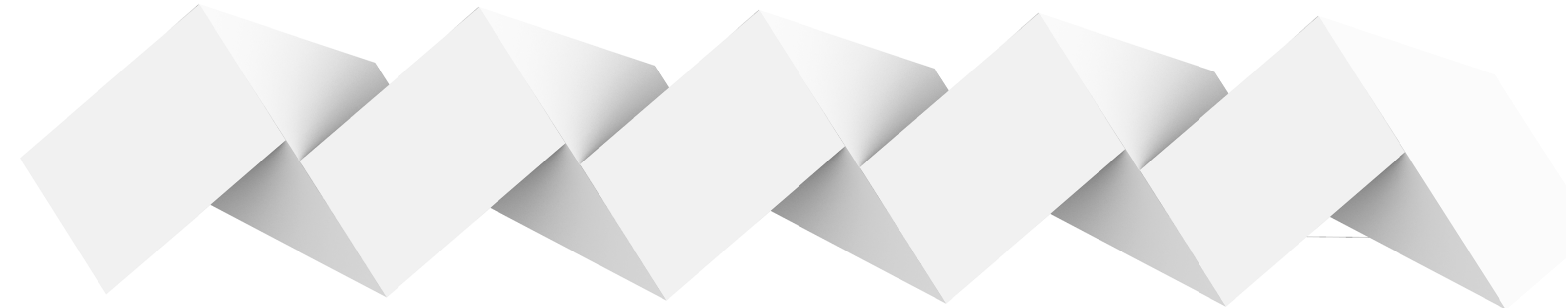


Figure 3.16 - Rubik Snake Toy

Figure 3.17 - Rubik Snake Module

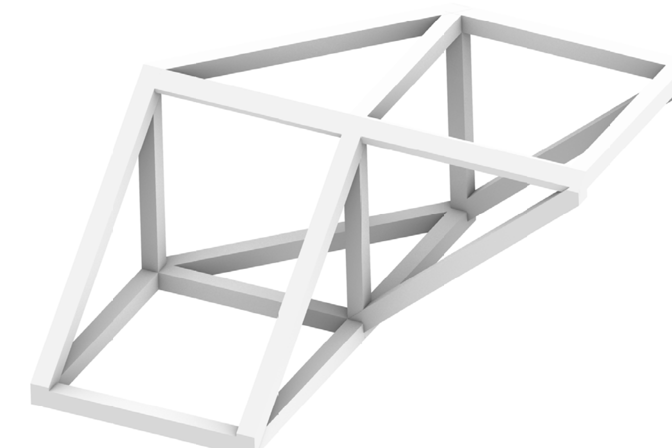


Figure 3.18 - Rubik Snake Skeletal Module

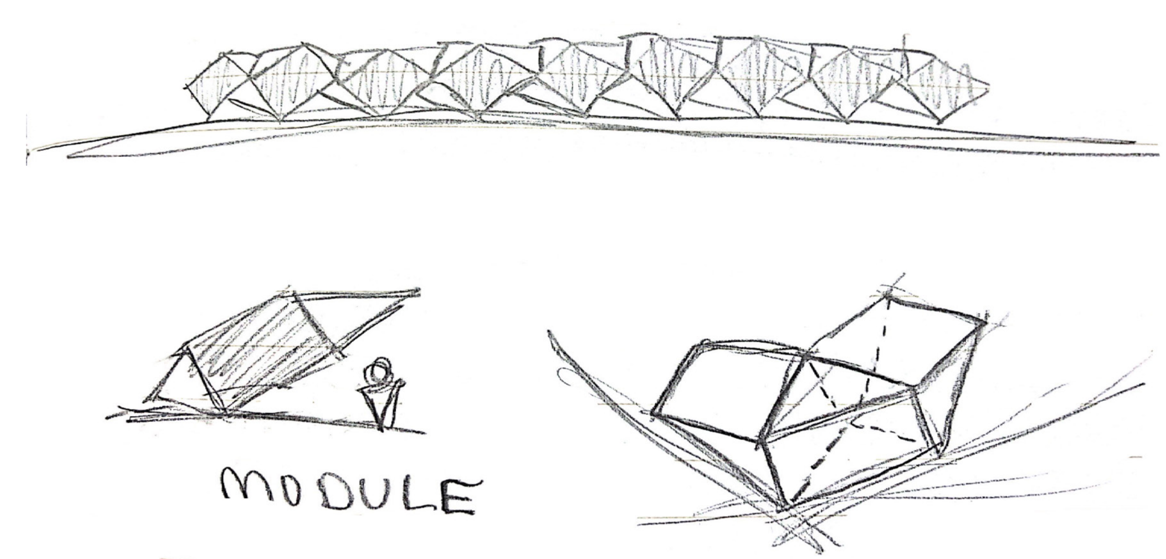


Figure 3.19 - Rubik Snake Module Analysis

3.3 - CHILDREN'S TOY EXPLORATIONS
3.3.4 - SOU FUJIMOTO CASE STUDY

CASE STUDY

Sou Fujimoto is a Japanese architect who focuses majority of his work intertwining nature and simplicity in a complex manor. His works are made of simple individual elements that, as a whole, become a more complex system. His design ideology is "not based on a concept of dialectical antithese and their sublation into a resulting third figure, but rather the princple of minimal differences in small shifts that transport the viewer and the resident into a strangely energised state" (Bielefeld, et al, 2013). His principles are to use simple elements in an organic fashion of organization to entise the person within the space, creating a contrasting state of space, a simple complexity. His use of scale creates those simple complexities where the volumes of the space, the floorplates, the walls, the circulation all varys.

I chose a case study analysis on House Before House because of its nature of simple yet organic complexities. This work involves simples cubes that are "stacked next to one and on top of one another seemingly unsystematically in a free-form way are, however, by no means lacking in intention or even concept" (Bielefeld, et al, 2013). This explanation shows how the stacking and roations of the spaces can create a playful space. He creates a sense of space that is inspired by Japanese architecture where stacking motifs are able to create a depth within the space that further entises the playfulness of the architecture.

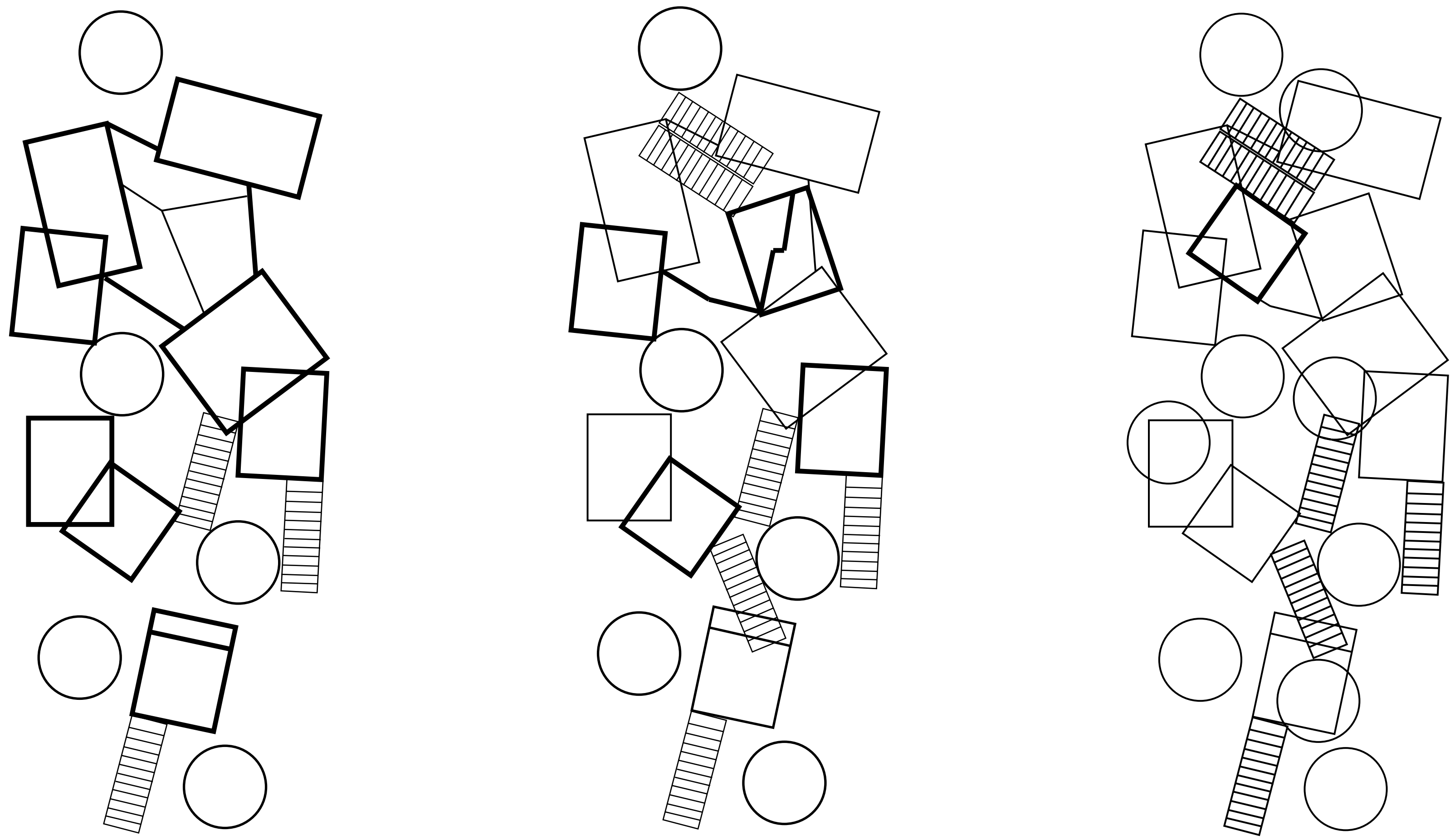


Figure 3.23 - House Before House Floor Plans

Design principles

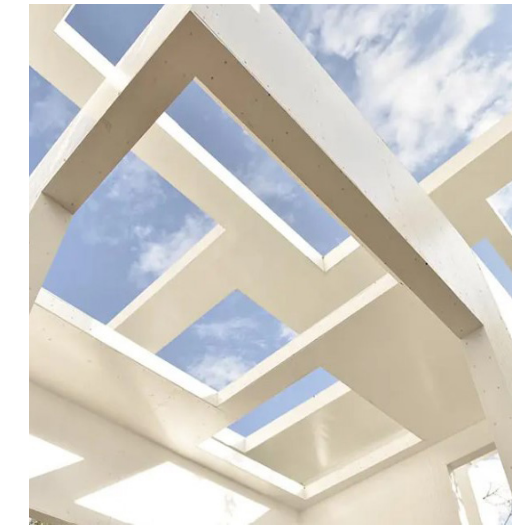


Figure 3.20 - Order & Chaos
https://www.interactiongreen.com/house-n-sou-fujimoto/

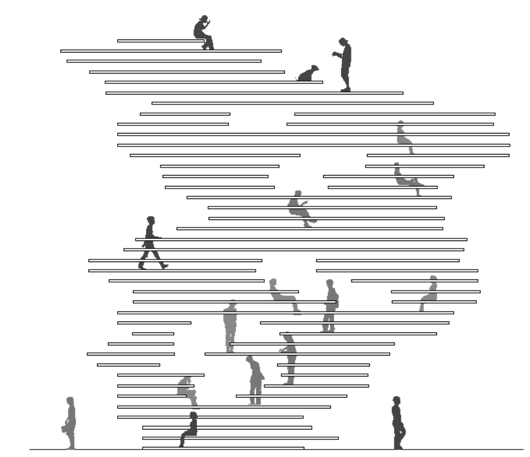


Figure 3.21 - Simple Complexity
https://www.pinterest.es/pin/339740365615687558/

Figure 3.24 - House Before House Exterior
https://www.flickr.com/photos/swych/5187680575

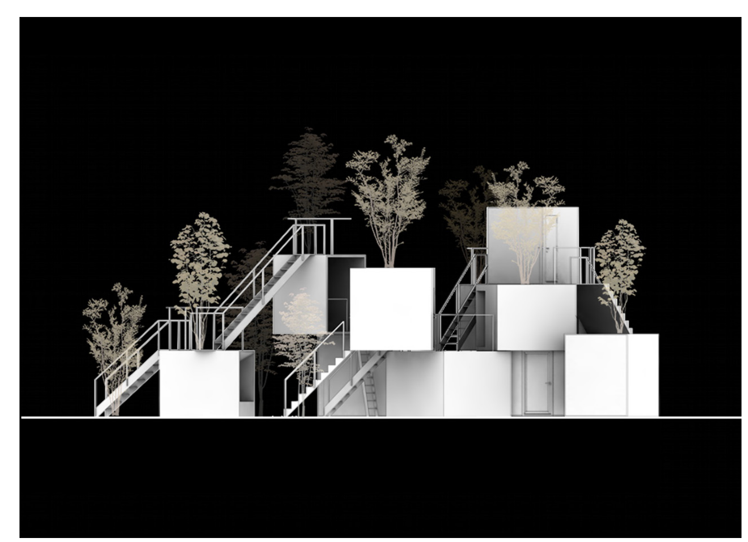


Figure 3.25 - House Before House Elevation
https://soed.ch/portfolio/house-before-house-virtual-reality/

Figure 3.22 - Organic/Nature
https://www.artsy.net/artwork/sou-fujimoto-architects-house-before-house

3.4 - DESIGN PROCESS FINDINGS
3.4.1 - DESIGN PROCESS FINDINGS

Each Design Exploration has significance in answering the first research question of : What are design strategies to create playful architecture that facilitate learning? Through several explorations I found design strategies that could best create a playful architecture that can teach children. Starting from the first explorations of the 2D and 3D elementary form of the square and the cube, I found that those best display the use of space and the definition of space - Space-Based Design - from an elementary form that, from an exterior perspective is simple for children to comprehend and be able to learn through. The 3D explorations began to bring in more complexity with varying heights, volumes, and orientations of the explorations. The 3D explorations bring some of the same ideals or principles of Fujimoto where there is a simple complexity about a space. For the 3D explorations, the 2D exploration plans were extruded at various volumes and roations to play with the space and explore playfulness in the design process. Using the plan view of the 2D and 3D explorations as well as the design principles found in the case study of Aldo Van Eyck's Sculpture Pavilion, the design strategy of game-based design developed. I used the plan view of the 2D and 3D explorations and my analysis of the Sculpture Pavilion to create a maze-like labyrinthing circulation that a game of Hide-and-Seek is played in. Semi-Enclosed or half enclosed spaces have the intention of a space to hide, to remain, to static space, and the pathways are intended to be for seeking, for movement. Both types of space work hand-in-hand to create playful space through the circulation and implied spaces that are found within the labyrinthing. The last design strategy i found was using Children's Educational Toys in the design process to create a playful space for learning. I chose to analyze and breakdown the Montessori Stacking Toy, Froebel Blocks, and the Rubik Snake toy. Each toy has unique elements that are used to teach whether that be tactile teaching, visual teaching, or practical teaching. Each educational toy, when brokendown, gave the use of implied space to define space without having to paint the full picture. The use of implied space as a teaching tool is wonderful for aiding in the growth of the children's knowledge of elementary forms, sequence, rythym, order, and other important elements that define our built environment. The case studies of Aldo Van Eyck and Sou Fujimoto's work and design principles are used as their own design strategies because their principles are unique to their works and design processes. Both architects have designed interactive and playful works, intentional or not. I am using those iteractive and playful elements through analysis and extrapolation in my findings of the initial research question of this thesis and testing each design strategy found in the explorations from this chapter to design Learning Playscapes and a Children's Museum for the design sythesis for this thesis on Playful Learning.

SUMMATION

- The design strategy for the best display of space and definition of space is Space-Based Design. 3D explorations of this strategy incorporate play in volume, scale, and orientation.
- Game-Based Design is playful for the freedom and interactivity within the circulation - inspired by the case study I did of Aldo Van Eyck's Sculpture Pavilion.
- My design exploration with the Children's Educational Toys were playful due to the playful aspects of the toys themselves. They use simple shapes, natural materials, and various scales for the children to learn from.
- Sou Fujimoto uses natural forms and sequences that guide the person through a playful circulation that labyrinths through.

CHAPTER FOUR

DESIGN SYNTHESIS

4.1 - TESTING DESIGN STRATEGIES
4.1.1 - LEARNING PLAYSCAPES

LEARNING PLAYSCAPES

A Learning Playscape is a space where children have the freedom to play and interact with the playscape at various levels, walking, running, climbing, etc. Their freedom allows them to wonder through the circulation and implied pathways that are mostly defined using implied elements from the explorations to find design strategies. Each scape has the oppotunity for the child to learn by playing and interact with space at various scales and enclosure.

The intent behind designing Learning Playscapes is to test the design strategies found in Chapter Three at the scale of architectural design - keeping the primary intent of creating and defining playful space. The purpose for designing Learning Playscapes instead of a school is to bring the playfulness elements out without relying on a fixed program that typically governs the way a school is designed. In my case study analysis of Aldo Van Eyck, I found that he has designed several playgrounds or playscapes accross the urban landscape of Amsterdam, where his designs are able to teach children the basics of shape, order, etc - as stated in the analysis from last chapter. While I will look at program for the Children's Museum, I am exploring the multitude of design possibilites for a playful environment that can be siteless or suitable anywhere - a universal guide for designing playful educational spaces.

Game-Based Design is a design strategy that focuses on the circulation and the intention for the circulation paths - intended to be a space for games such as hide and seek with static and dynamic spaces present simultaneously. This matrix also consists of Game-Based Design cojoining with Circulation-Based Design, Aldo Van Eyck Based Design, and Sou Fujimoto Based Design to give design opportunities that are not open with just one design strategy.

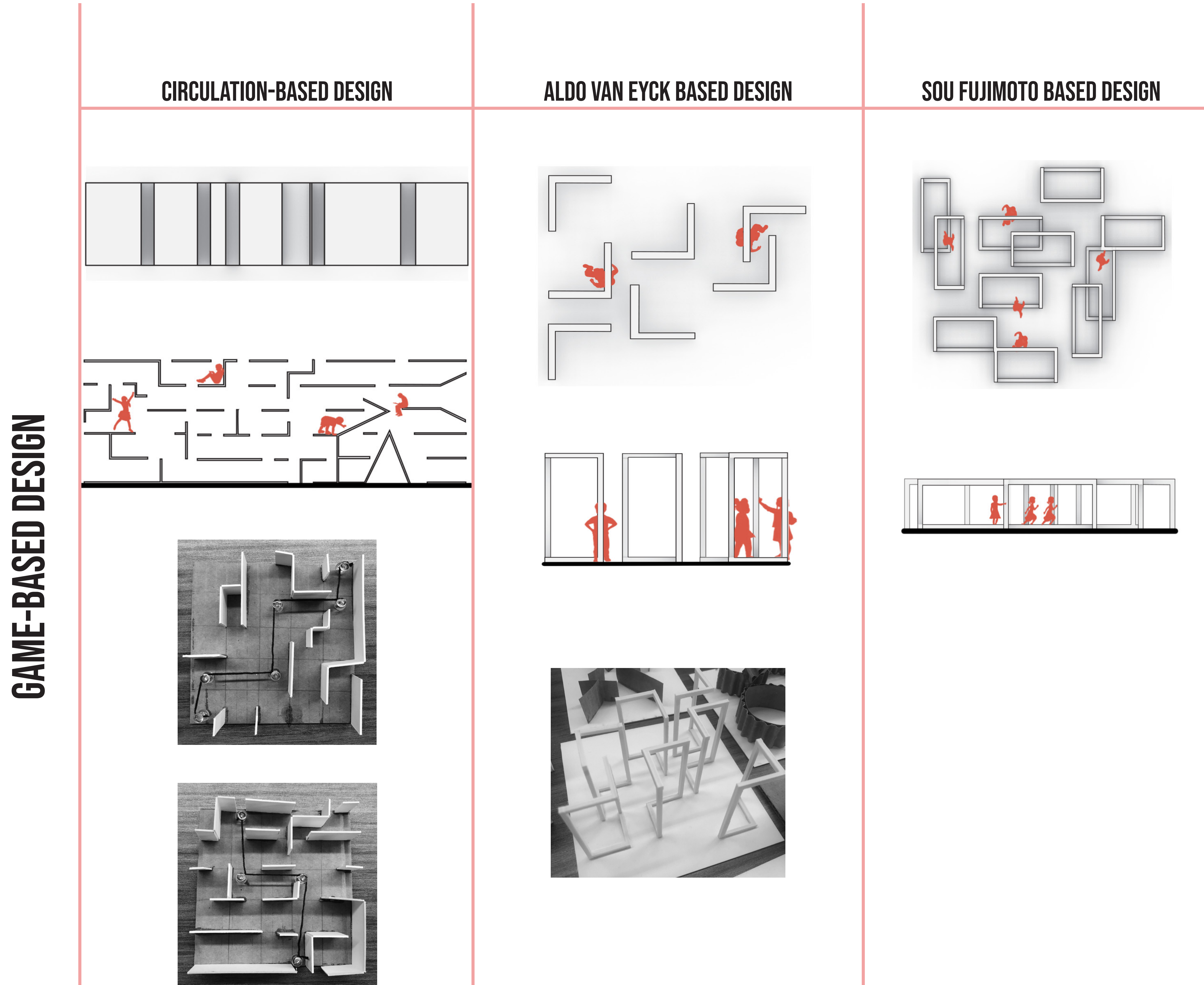


Figure 4.1 - Game-Based Design Learning Playscape Matrix

4.1 - TESTING DESIGN STRATEGIES
4.1.1 - LEARNING PLAYSCAPES

LEARNING PLAYSCAPES

Children's Toy-Based Design follows the criteria from the findings of the design strategies using Children's Educational Toys. These strategies are found from my analysis of the Montessori Stacking Toy, Froebel Blocks, and the Rubik Snake Toy. This matrix also consists of Children's Toy-Based Design cojoining with Circulation-Based Design, Aldo Van Eyck Based Design, and Sou Fujimoto Based Design to give design opportunities that are not open with just one design strategy. Each exploration focuses on creating and defining a playful and interactive learning space through the freedom of circulation and ability define the space based on the elements developed from the previous chapter's design explorations.

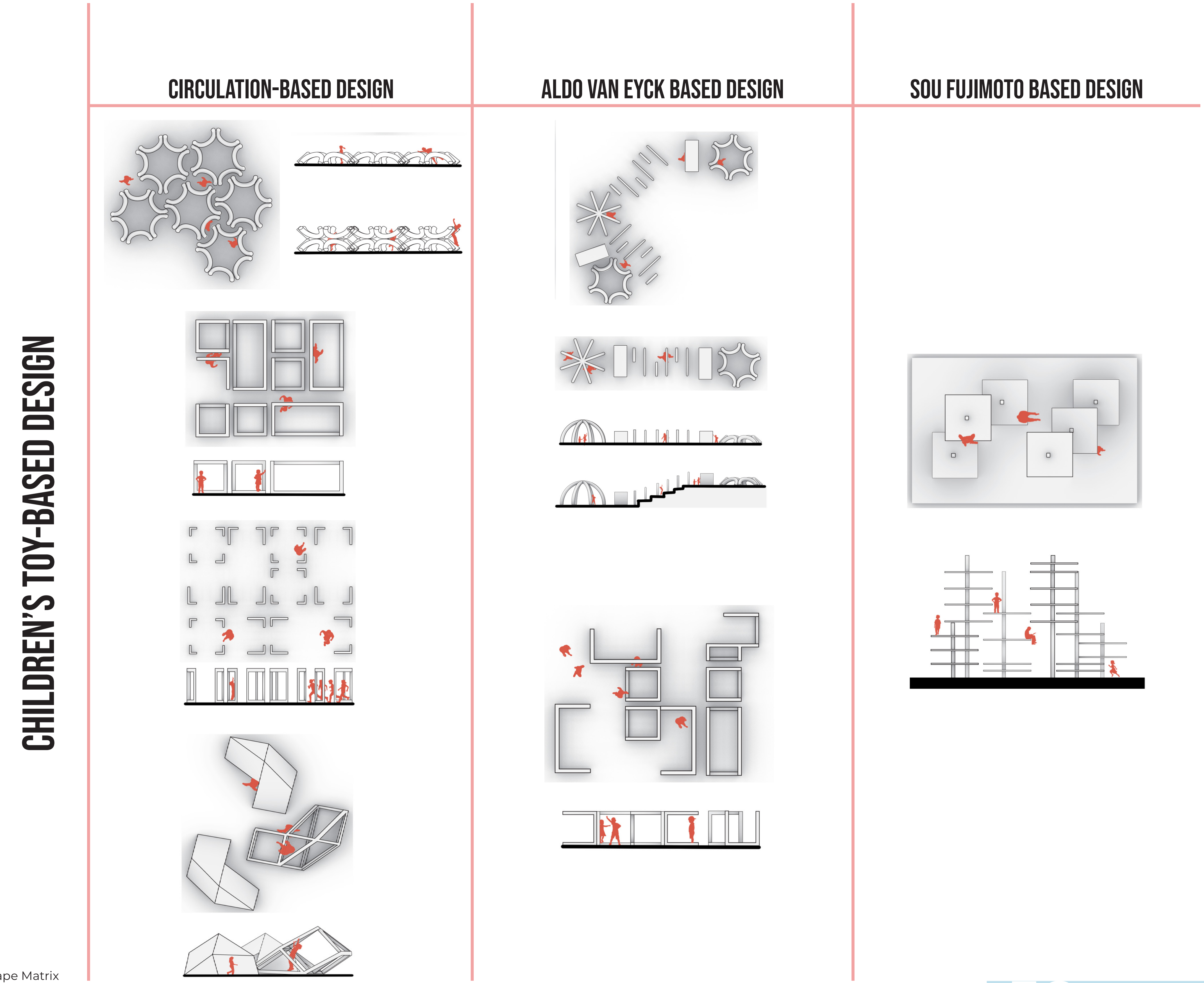


Figure 4.2 - Children's Toy-Based Design Learning Playscape Matrix

4.1 - TESTING DESIGN STRATEGIES

4.1.1 - LEARNING PLAYSCAPES

LEARNING PLAYSCAPES

Space-Based Design is developed from the findings of teh 2D and 3D design explorations of the square and cube. The principles found from those explorations are used in the design/design process of these Learning Playscapes. This matrix also consists of Children's Toy-Based Design cojoining with Circulation-Based Design, Aldo Van Eyck Based Design, and Sou Fujimoto Based Design to give design opportunities that are not open with just one design strategy. These strategies and playscapes focus on designing playful learning spaces at various scales and volumes of space.

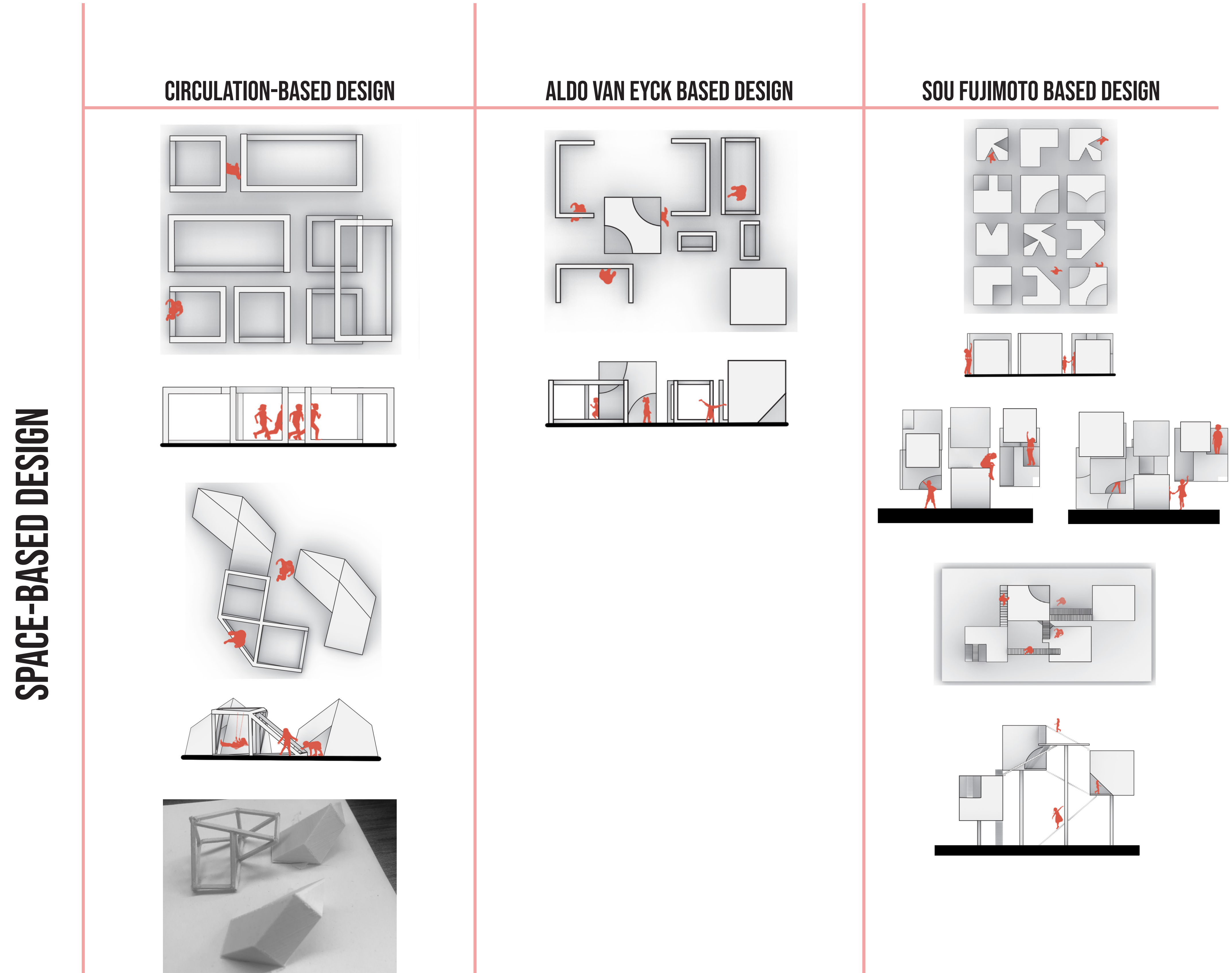


Figure 4.3 - Space-Based Design Learning Playscape Matrix

4.1 - TESTING DESIGN STRATEGIES
4.1.1 - LEARNING PLAYSCAPES

LEARNING PLAYSCAPES

The elements that were used for the Learning Playscapes were designed as families. The families are the use of a asic shape or shapes as space and as a skeletal variation of the form. Both types are from the basic shape and can be used to create implied space or void or additional space that could be implemented into changing the circulatory paths both in plan and section. A selection of the playscapes are shown as examples of what the elements of the families can be designed from. Each family of the skeletal space and the space from the basic form can be combined design the best playful learning spaces because of the freedom of circulation and the variation within the environment of the design.

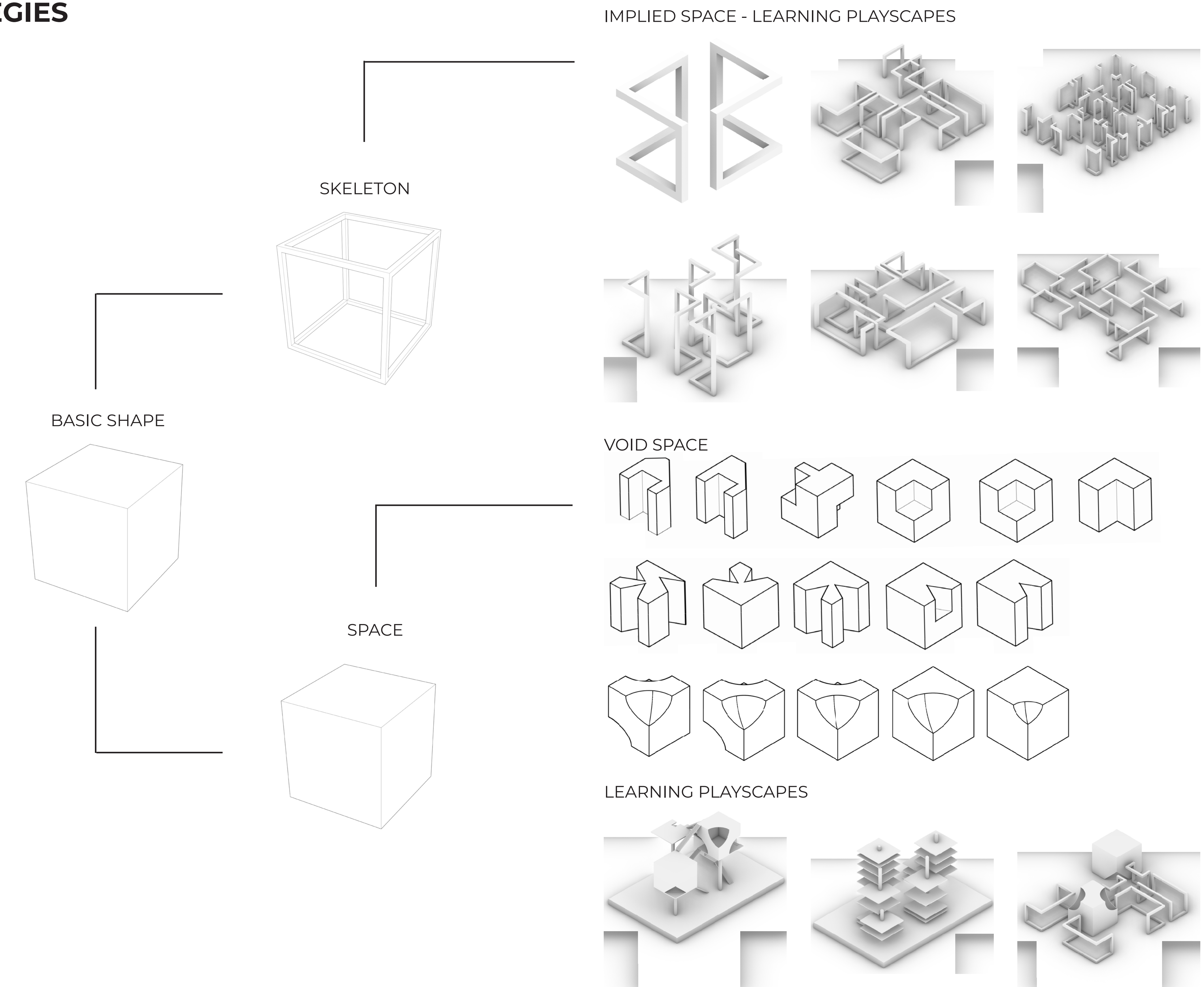


Figure 4.4 - “Family” Module Development

4.1 - TESTING DESIGN STRATEGIES
4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

CHILDREN'S MUSEUM : PLAYFUL WEB

The design of the Children's Museum combines three design strategies from the design explorations - Sou Fujimoto, Aldo Van Eyck, and Children's Toy-Based Design with Froebel Blocks principles. The design intent with using each of these design strategies is to produce the best concept of how these design strategies can be used to create a playful and interactive learning environment. The use of Sou Fujimoto's design principles is to bring the order and the small shifts in the space that he implements in several of his works. Fujimoto's stacking motifs are also referenced in the design of the Children's Museum, as well as a reference to the stacking of Froebel Blocks. The Froebel Blocks design strategy is the family module that is used for the basic form of the Museum with the implementation of additional and void space for each modular element. The scale and volumes change within each module so each one is a unique space. The concept intent for the circulatory plan is from the case study of Aldo Van Eyck's Sculpture Pavilion and the ordering principles that he used in his design processes. The playfulness comes in through the freedom and interactivit within each open for semi-enclosed space, enough to be able to have the freedom for game play...maybe hide and seek.

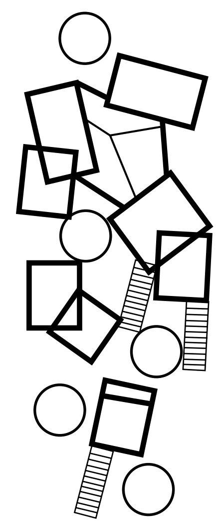


Figure 4.5 - Sou Fujimoto Design Strategy

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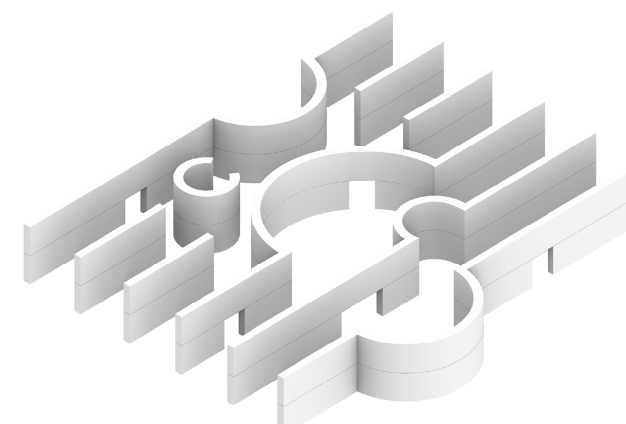

Figure 4.6 - Aldo Van Eyck Design Strategy

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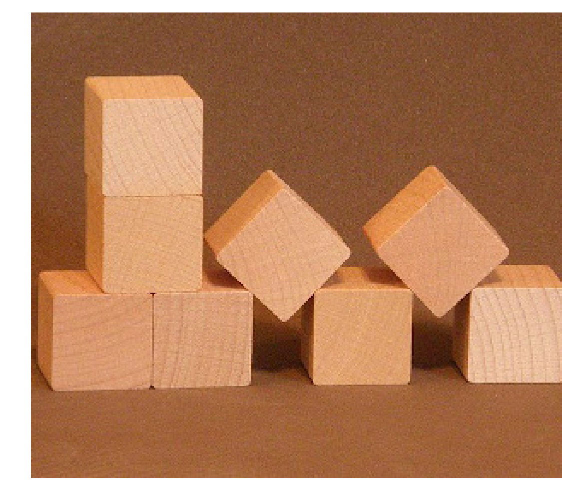
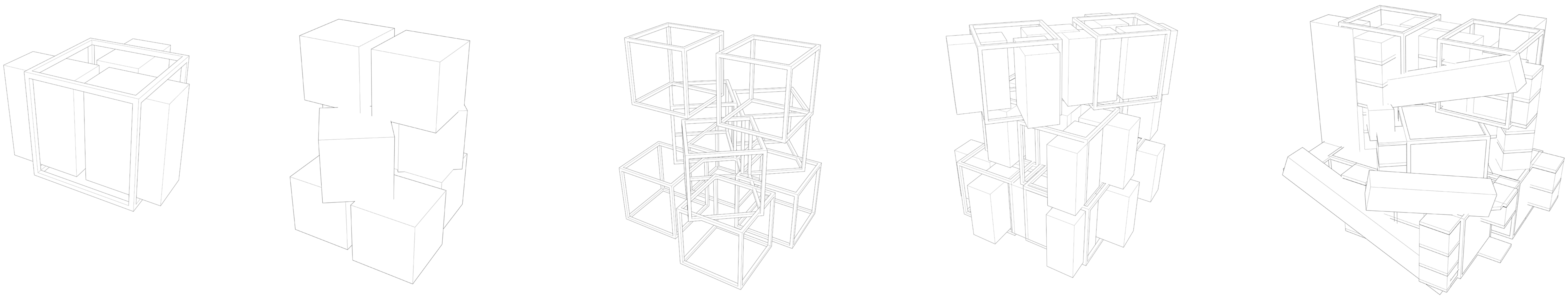


Figure 4.7 - Froebel Blocks Design Strategy

4.1 - TESTING DESIGN STRATEGIES

4.1.2 - CHILDREN’S MUSEUM : PLAYFUL WEB

CHILDREN’S MUSEUM : PLAYFUL WEB



MODULE | CUBE FORM | SKELETAL FORM | MODULE FORM | FINAL FORM WITH CIRCULATION

Figure 4.8 - Children’s Museum Design Development

FLOOR PLANS

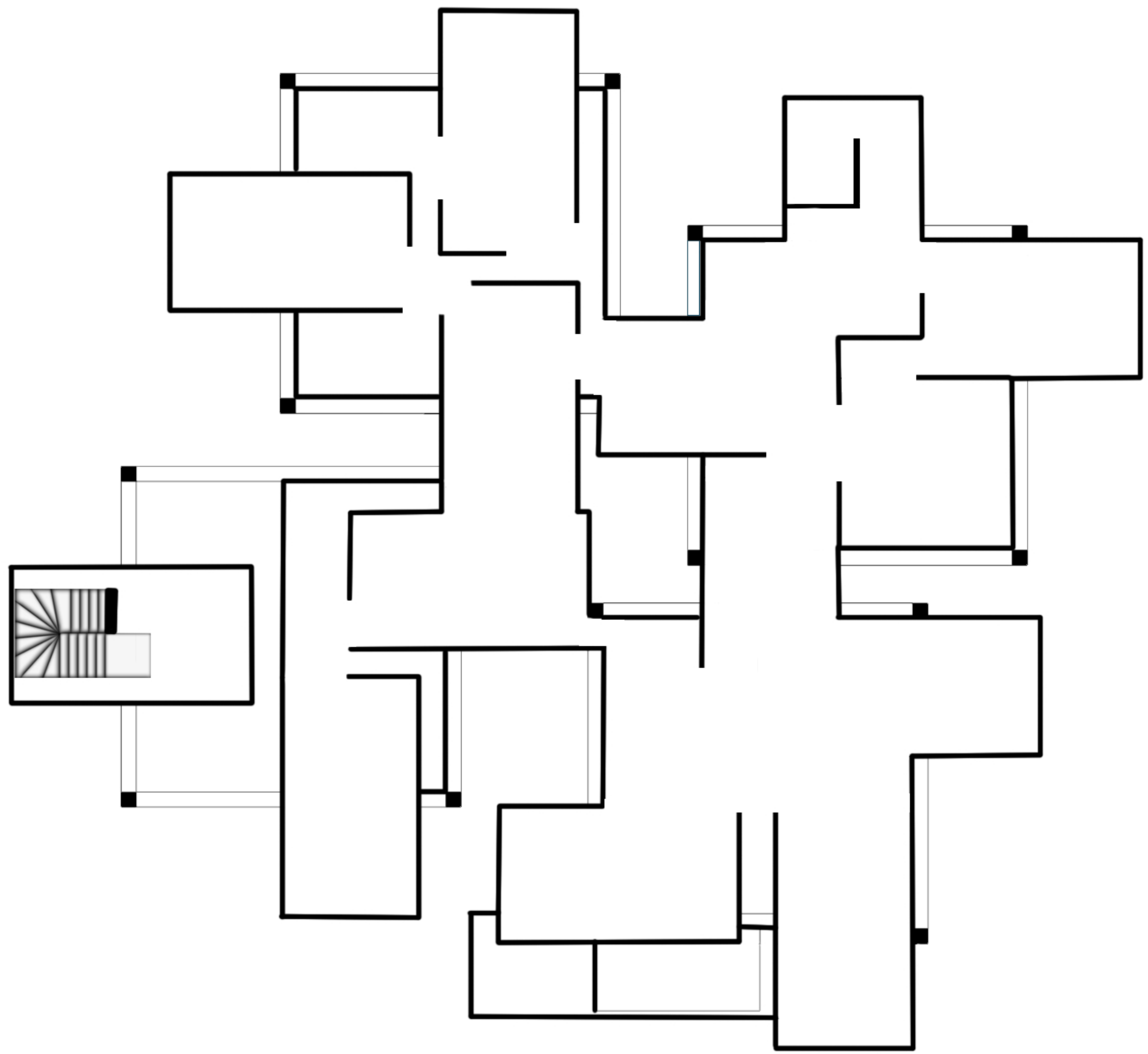


Figure 4.9 - Children's Museum Floor Plan - Level 2

4.1 - TESTING DESIGN STRATEGIES
4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

FLOOR PLANS

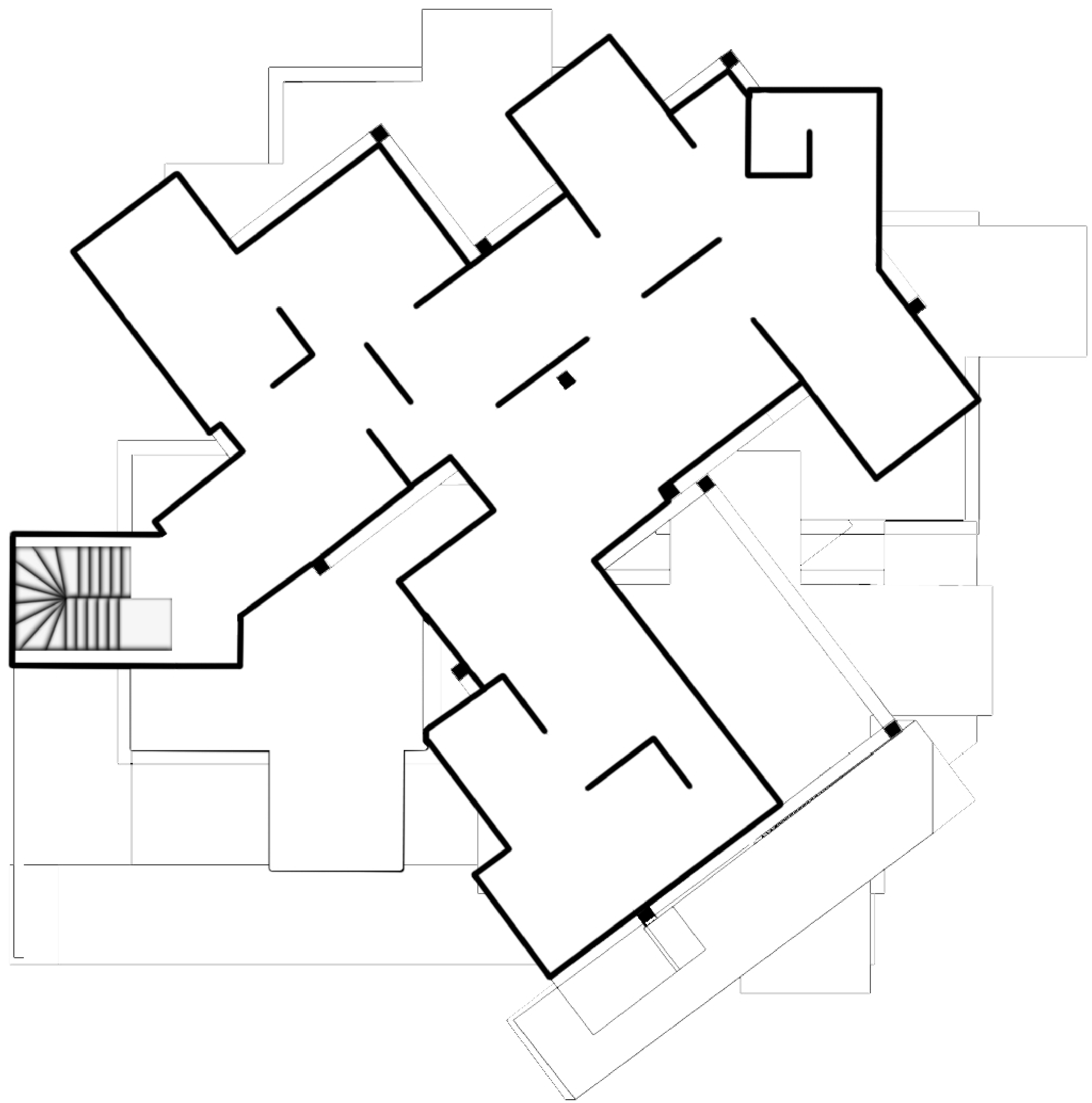


Figure 4.10 - Children's Museum Floor Plan - Level 5

4.1 - TESTING DESIGN STRATEGIES
4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

FLOOR PLANS

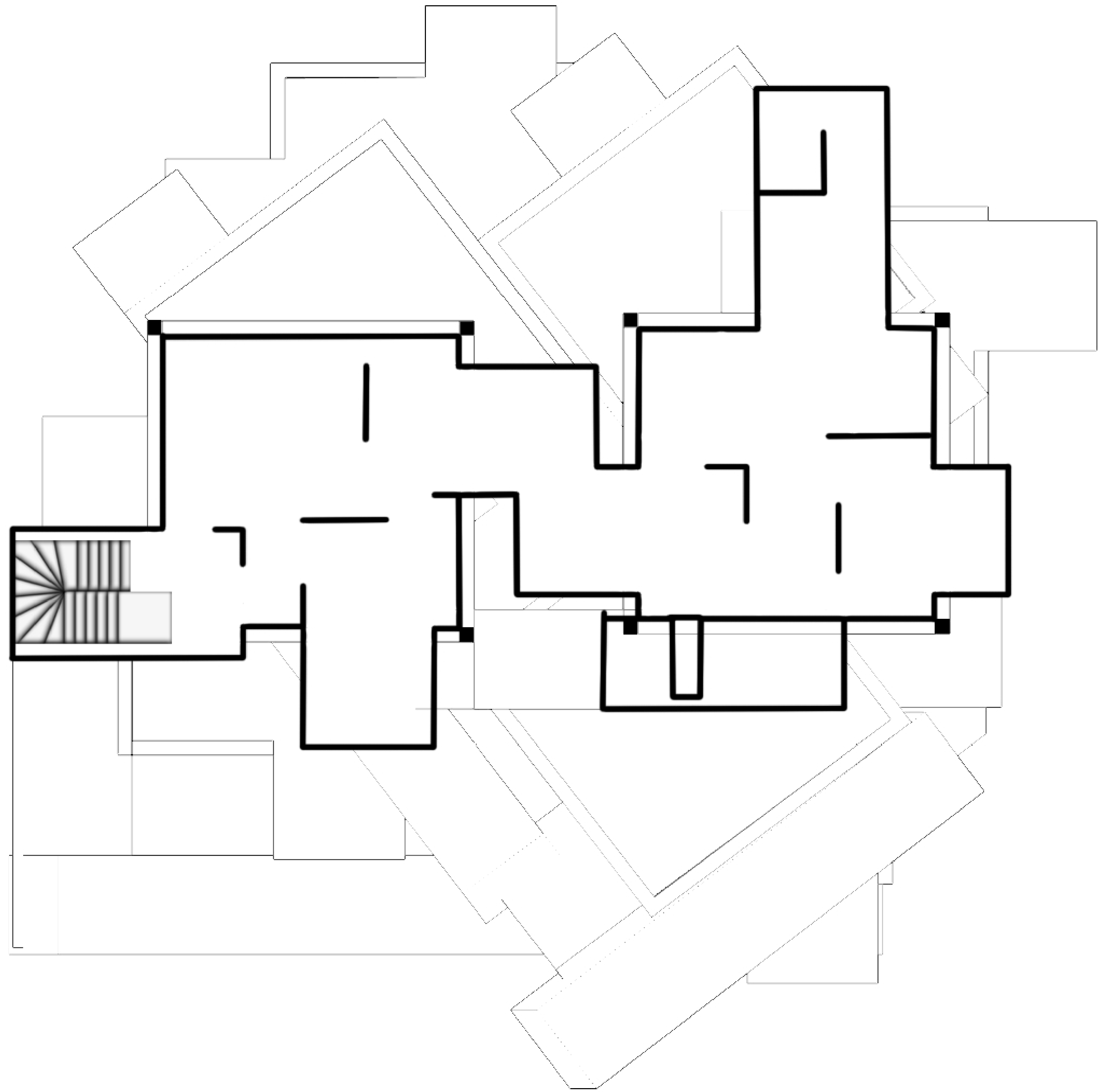


Figure 4.11 - Children's Museum Floor Plan - Level 8

4.1 - TESTING DESIGN STRATEGIES

4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

CHILDREN'S MUSEUM PROGRAM

Arts

Hands-On Activities

Educational Space

Gallery

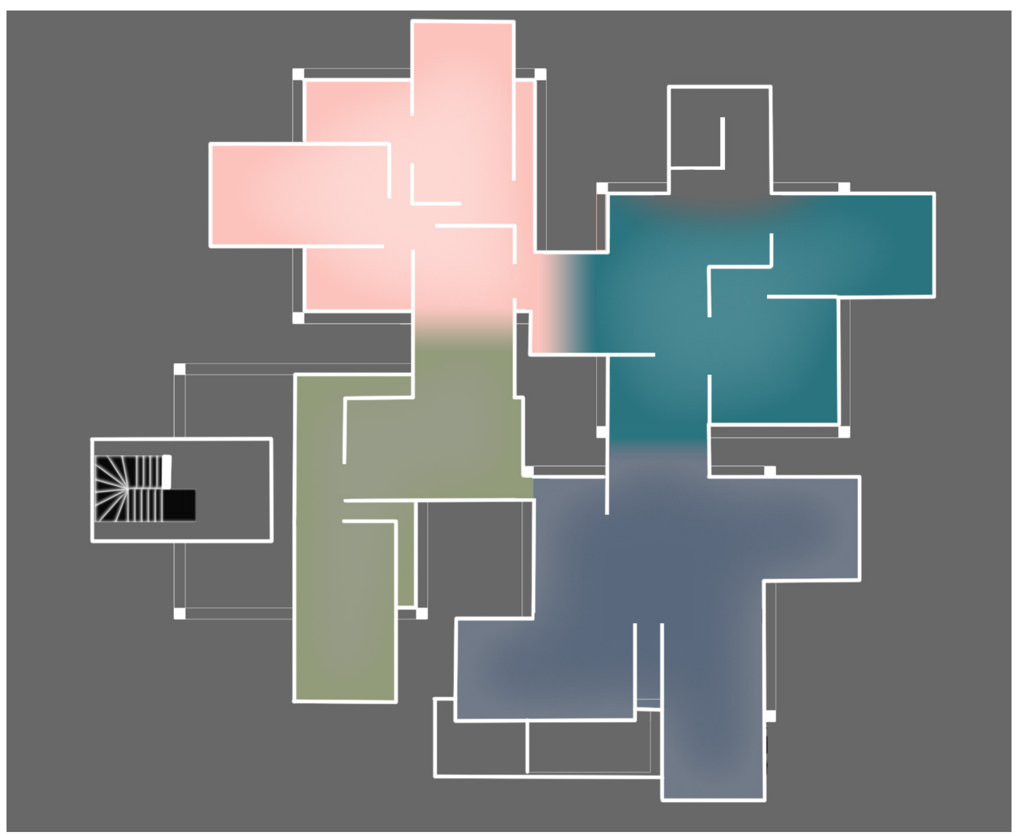


Figure 4.12 - Children's Museum Program Level 2

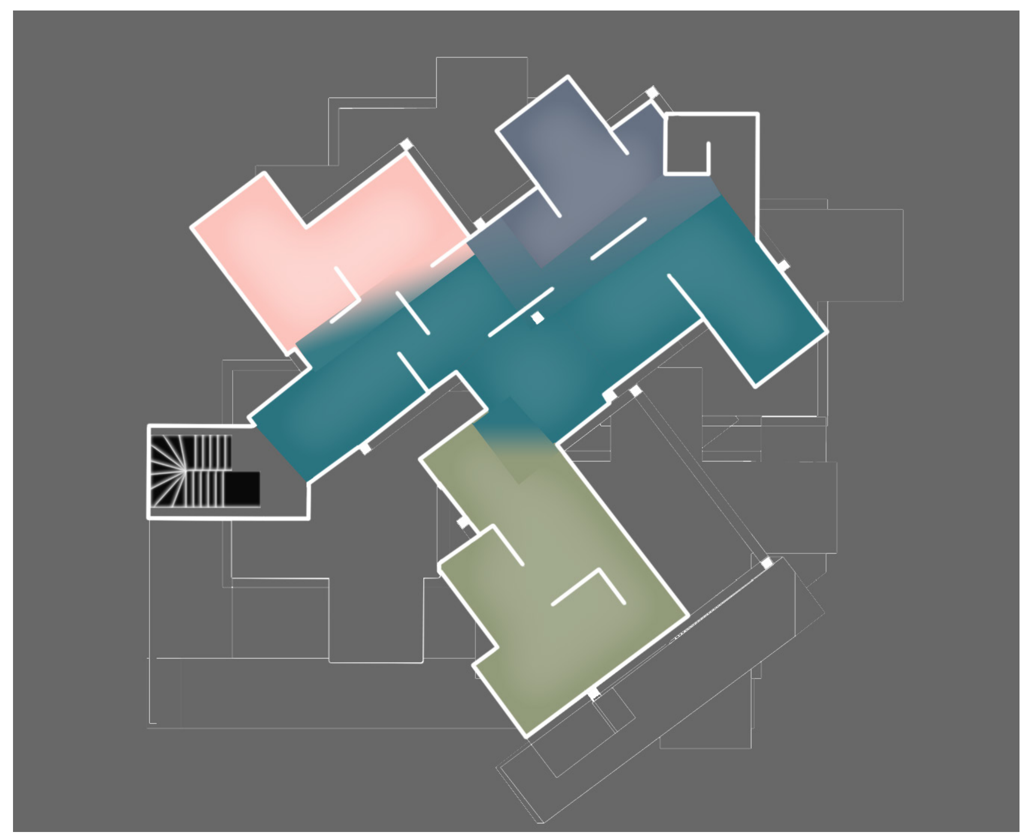


Figure 4.13 - Children's Museum Program Level 5

Figure 4.14 - Children's Museum Program Level 8

CIRCULATION

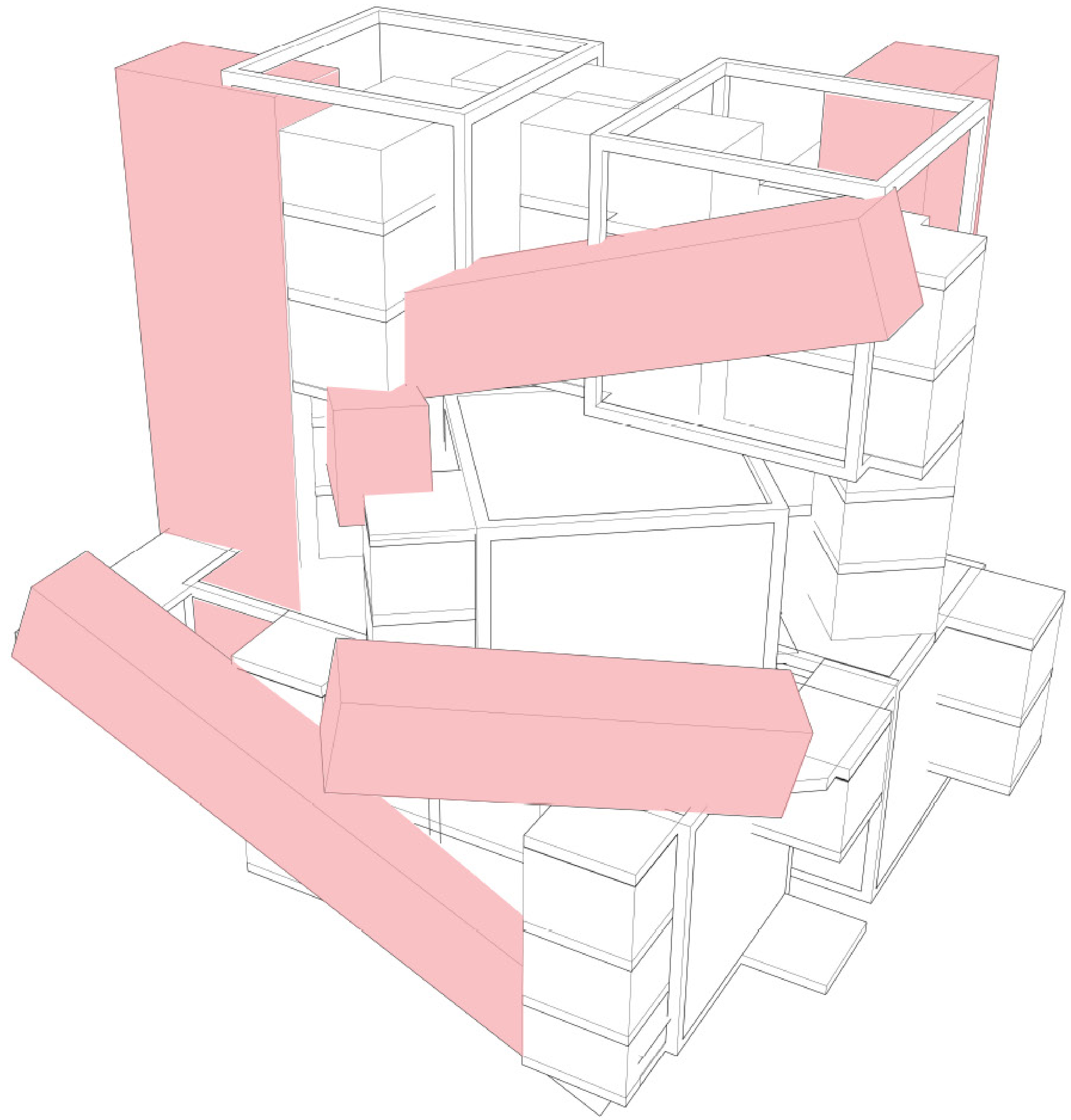


Figure 4.15 - Children's Museum Circulation Diagram

4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

SECTION

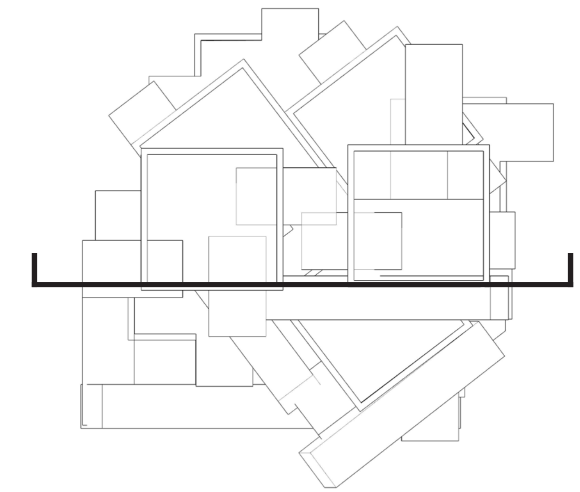


Figure 4.16 - Children's Museum Section

4.1 - TESTING DESIGN STRATEGIES
4.1.2 - CHILDREN'S MUSEUM : PLAYFUL WEB

RENDERS

Figure 4.17 - Hands-On Activities Space

Figure 4.18 - Educational Space

Figure 4.19 - Gallery Space

4.2 - DESIGN SYNTHESIS FINDINGS
4.2.1 - DESIGN SYNTHESIS FINDINGS

The intent for the designs of this thesis to be siteless allows for this thesis to become a manual for designing educational spaces with the basis of play - an essential element in childhood and education. The final designs of the Learning Playscapes are tests that were designed using the design strategies explored in chapter three. Each design had unique elements that harnessed the primary intent for each design strategy. The findings from the Learning Playscapes was that certain combinations of the design strategies such as the Game-Based Designs and the Circulation Based Design Strategies was a sucessful iteration based on the criteria that was established. Another successful design was the combination of the Space-Based Designs and the Sou Fujimoto Based Designs with the play of the 2D and 3D circulation and volumes. Each of these successful designs gave reason and further criteria to follow to implement into the design process of the Children's Museum design. Although the Children's Musem is not detailed to entail fully how the building would function, it is designed as a representation of the space that can be created using the design strategies found - fulfilling the purpose and research of this thesis.

The findings of this thesis are able to answer the primary research questions that started this year and a half long process. The research questions are: What are ways that the physical space can stimulate playful learning through enclosure of space, configurations of space, and interactivity? and What are design strategies to create playful architecture that facilitate learning? These questions are answered through these design tests from the Leanring playscapes to the Children's Museum, and hopefully more to come in the future.

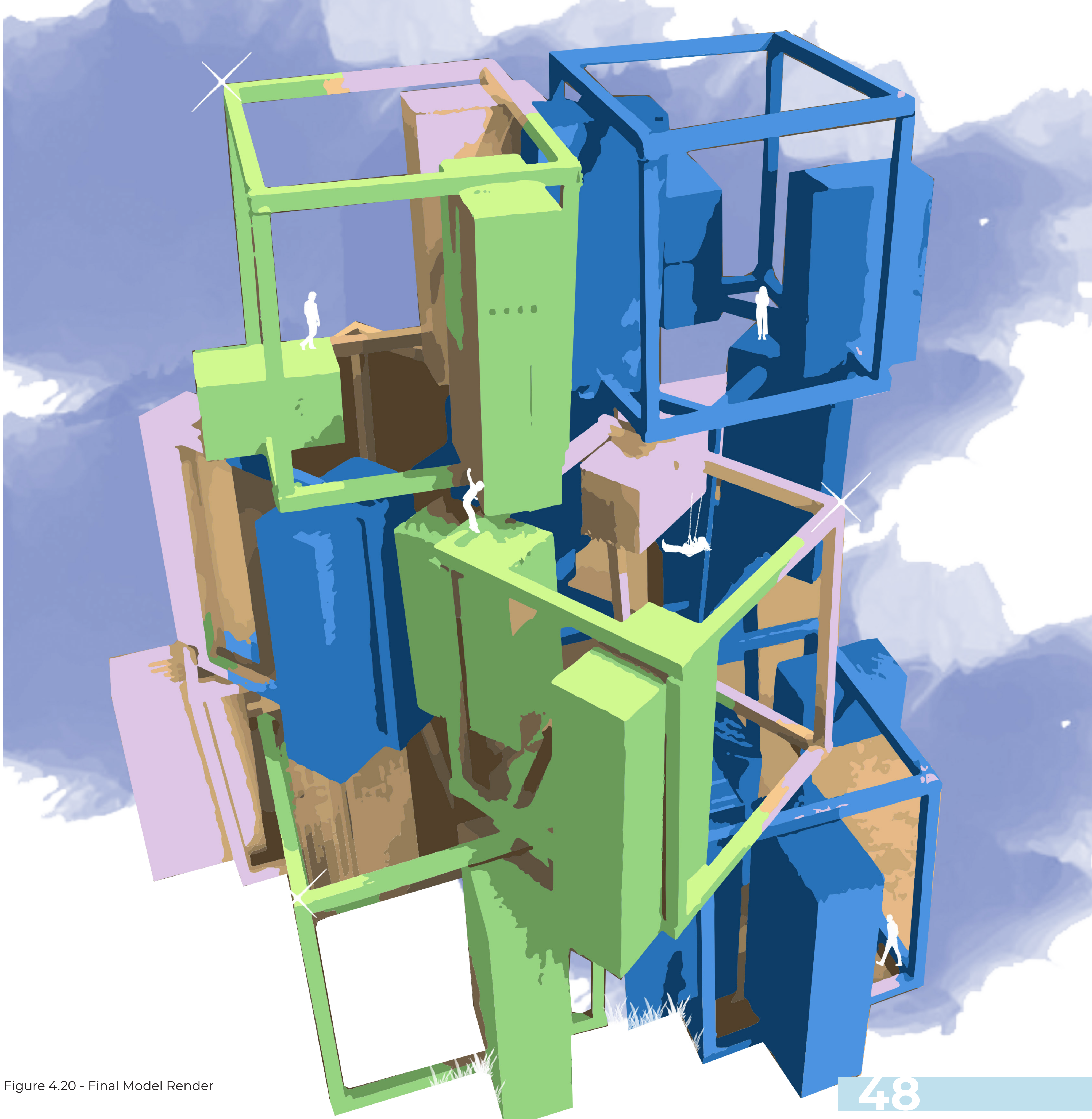


Figure 4.20 - Final Model Render

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Figures

All figures are created by me, Alyssa Franklin, unless stated otherwise.

THANK YOU