



Kansas 4-H Interior Design and Architecture

Architectural Focus | Marble Enclosure

Overview

At the core of Architectural Design is the ability to create spaces, or rooms, for people to occupy. Architectural designers use tools such as walls, columns, level changes, roofs and ceilings to define or create space.

Many architectural designs feature more than one space, and a designer must orchestrate and determine the sequence in which people move from space to space, along with the relationship each space has to one another. Some spaces are created for people to move quickly through, while other spaces are designed for rest or stillness. Additionally, some spaces may feel more open and connected to one another, while other spaces have strict barriers such as walls or screens that separate them.

Imagine you are the size of a marble moving through a sequence of rooms. **Your task is to create a variety of rooms within a maximum dimension of Length:18" x Width: 24" Height: 12" for your marble to move through.** You will use different types of elements to enclose each of your spaces, as well as learn and apply fundamental design vocabularies (see Glossary).

As you design your spaces, consider the size of the marble to be relative to the size of a human. Do you want some of your spaces to feel big and open, while others feel small and enclosed? What is the height of a doorway or ceiling compared to that of the marble? Pay close attention to the sizes of architectural elements relative to the size of the marble.

What You Will Learn

- Design Fundamentals and Vocabularies
- Foster Imagination and Empathy for Human Experience
- Making and/or Drawing
- Writing and Reasoning
- Conceptual Drivers
- Craftsmanship

See It in Real Life!



Top: Listening to Joy, Yinka Ilori
McGurk, M. (n.d.). *Listening to Joy* [Photograph of Structure Overview]. Dezeen. <https://www.dezeen.com/2022/01/09/yinka-ilori-creates-maze-of-colour-and-sound-for-va-dundee/>.

Bottom: MultiPly, Waugh Thistleton
Reeve, E. (n.d.). *MultiPly* [Photograph]. Ed Reeve. <https://editphoto.net/work-section/multiply-waugh-thistleton/>.

Did You Know?

The famous Egyptian, King Tutankhamun, also played with marbles! Upon discovery of his tomb several marbles were found buried along with him in his tomb (Smythe, 2022).



Getting Started

Every good designer starts a project by identifying a **clear goal** for the project. Every decision they make regarding the design should be in support of the over arching goal. You should create a goal for your marble enclosure. The following is a list of ideas to get you started, though you may chose to develop a new idea.

- Create a maze-like environment for your marble, with the goal of reaching an important destination
- Create an arena for your marble to play hide-and-seek
- Create a pin-ball-like arena for your marble – are there certain surfaces or materials that are off-limits for your marble to touch?

Once you have your goal in mind, you can begin thinking of ideas! Check out the Glossary for design tools to help support your ideas. The best way to begin is to build! Decide if your marble enclosure will be built on top of a flat base, or if it will be something that can be rotated, like a cube. Whatever your choice, always keep your goal in mind!

As you build, you may find that you need to remove or add things - that's okay! Enjoy the process and be open to ideas that reveal themselves. You will probably want to build your enclosure several times. Each time you build it, you will want to practice your **Craftsmanship**. This means that your final model should be free of dried glue or surface marks, any joints you have constructed fit tightly together, and any edges that have been cut are clean and straight.

If you are seeking more of a challenge, you may want to pick up a Side Quest!

Materials You May Use

Marbles!
 Glue (hot glue, tacky glue, super glue)
 Cardboard
 Poster or Foam Board
 Cardstock
 Basswood (sheets, sticks, dowels)
 Paper
 Pencil
 Straight Edge / Ruler
 Wire
 Foam or Styrofoam
 Clay
 Straws
 Paper Towel Tube
 Sticks
 Beads
 Noodles
 Leaves
 Pom Poms
 Fabric

Side Quest!

- Can you recognize a pattern in your design choices? Do you have one larger strategy that all of your decisions were based on?
- Can you design an environment where the marble moves vertically as well as horizontally?
- Can you design an environment with different lighting experiences?
- Is there a series of rooms or does the complexity of each space increase along its path?
- Could someone guide the marble through the maze without making any wrong turns?



2D and 3D Representation of Ideas

Plan:

A plan drawing occurs when we look down at an object or building from above. This drawing is “flat” and has no depth. Sometimes, we can create a variation of this drawing, called a **Floor Plan**, where we cut through the building horizontally, remove the top of the building and look down into the interior.

Section:

A section drawing occurs when we look at an object or building from the side, but we cut through it vertically and remove part of it, so we can see all the spatial definition happening on the interior.

*In Floor Plans and Sections, objects that have been cut through receive a darker outline. This helps with legibility and depth in the drawing. Lines which are darker are closer to the viewer.

Oblique or Isometric:

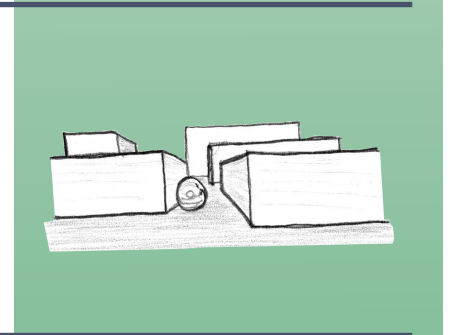
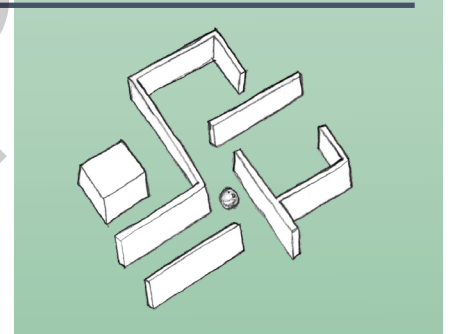
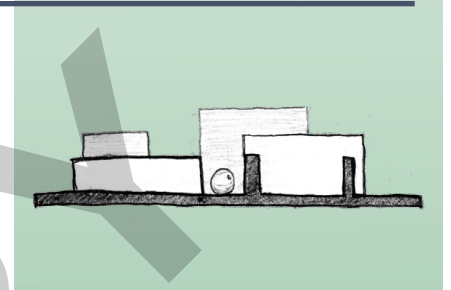
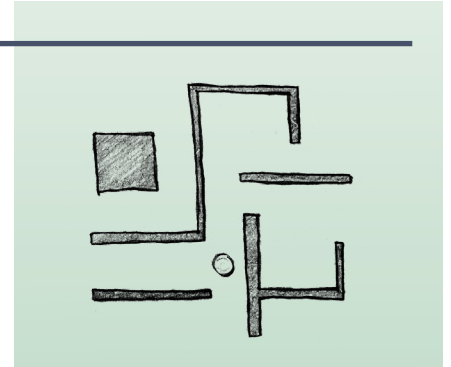
A measurable, 3-dimensional drawing

Perspective:

A perspective drawing gives us the experiential aspect of a space. It is drawn as if we are standing in the space, and recedes to a vanishing point to establish depth

Model:

A model is a 3-dimensional representation of your design. It can illustrate the mass of the object or building and can be interacted with. This will be the quickest way to visualize your ideas.



Diagrams: Rebekah Lyons (KSU)

Center for Architecture. (n.d.). [Photograph of Marble Maze]. Center for Architecture. <https://www.centerforarchitecture.org/k-12/resources/design-a-marble-maze-using-scrap-cardboard/>.



Deliverables

A built model of the enclosure is required, no matter which option is chosen for Fair Entry. Option 1 and 2 provide you with an opportunity to document and present your design without transportation of the physical model to the Fair.

Option 1: Presentation Board include the following:

1. Drawings of your Design (Floor plan, Section, etc.)
2. In addition to your base drawings, you may produce small illustrations to help your audience understand the path of travel for the marble, or the rules for which you designed. These illustrations are called **Diagrams**, and are used heavily by real-world designers to showcase the ideas behind their work.
3. High Quality photograph sequence showing the Marble moving through the Built Design. Images may be annotated. This sequence should visually tell the Story of your Design.
4. Write or Type a brief description of your Design Intent (1-3 paragraphs in total). See the prompts below to help you get started. You don't have to answer all of the prompts, but your summary should be thoughtful and provide reasoning behind your decisions.

Option 2: Exhibit - Include the following:

1. Marble Enclosure Model - Maximum dimensions are 18" L x 24" W x 12" H
2. In addition to your model, you may produce small illustrations to help your audience understand the path of travel for the marble, or the rules for which you designed. These illustrations are called **Diagrams**, and are used heavily by real-world designers to showcase the ideas behind their work.
3. Write or Type a brief description of your Design Intent (1-3 paragraphs in total). See the prompts below to help you get started. You don't have to answer all of the prompts, but your summary should be thoughtful and provide reasoning behind your decisions.

Design Intent Prompts

- » What was the Goal for your design?
- » Did you pursue a Side Quest? If so, how does this side quest work to support your overall Goal?
- » What design vocabularies have you implemented to support your Goal?
- » What is the reasoning for the shape and size of your overall enclosure?
- » How are you using a variety of architectural elements to enclose each space and why?
- » How did you determine the number of spaces and their sizes? How does this impact the journey for the marble?
- » Are there spaces intended for movement, and spaces intended for rest? How did you create this effect?
- » Where is the most important space, and what makes it the most important?
- » Did material choices or color play a role in the design? How do these support your overall Goal?
- » Are there any other features that you included that help to emphasize the goal of your design?
- » Describe the process you undertook to develop your design. Did you try multiple iterations?



Glossary of Fundamental Design Vocabulary

Enclosure: The use of architectural elements used to define space or a series of spaces

Spatial Definition: Space is infinite, and intangible, but when we give it elements of enclosure, we can begin to define the boundaries of space. In some cases, boundaries can be real and solid, such a wall. In other cases, boundaries are perceived, such as a change in flooring material defining the boundary between two adjacent rooms in your house. In Architectural Design, we tend to investigate 3 opportunities for defining space: Points, Lines, and Planes (not the flying kind!).

Point: A point can be a single object in space which anchors the space. Imagine a large, vast field of wheat with a single large oak tree in the middle of it. This tree acts as a point, to which the rest of the field responds.

Line: A line can connect two or more points and begin to form a tangible barrier. A line can be horizontal in nature, such as an overhead Beam, or vertical in nature, such as a column. Imagine now that there is a row of smaller trees leading you from the edge of the field to the larger tree in the center. By planting this row of trees, you have created both a series of vertical lines (the individual trees) and a horizontal line (the row of trees read as a line).

Plane: A plane refers to objects such as walls, ground, and ceilings. A plane typically has a large, flat surface on two faces, and a narrow edge on 3 or more sides. Typically, we refer to planes in 3 ways:

- *Vertical planes* equate to walls, screens, windows, planter boxes, etc. And can be manipulated using color and materiality, or by strategically creating openings in or between planes.
- *Base planes* refer to the ground we stand on, and can be manipulated by raising or lowering portions, or changing materials to imply a perceived boundary;
- *Overhead planes* refer to items such as ceilings, roofs, pergolas or canopies. An overhead plane can also be manipulated by raising or lowering portions, creating openings, and changing the materiality.

Wayfinding: the way people navigate space and understand their position within a series of spaces. Sometimes we rely on signs to understand where to go but there are many well designed clues in your everyday life gently leading to your destination. Examples could include clear sightlines, hallways that are more narrow to indicate the path of travel or even awnings outside of the main door that help you understand the location of an entrance.

Did You Know?

It would be very difficult to model or draw a building at its full size! So when designers draw a building on paper, we make them smaller and label the drawing with a Scale, such as Scale $\frac{1}{4}'' = 1'0''$. This means that one quarter of an inch on paper is equivalent to one foot in real life.



Glossary of Fundamental Design Vocabulary Continued

Scale: The size of something relative to a unit of measurement. For instance, a football field is 360 feet long by 160 feet wide. This measurement is the size, or scale, of the field.

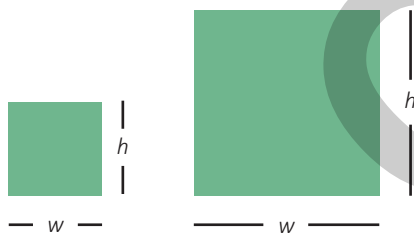
- *Human Scale* - When designers create buildings, chairs, doors and more, we use the human body as a reference for the sizing of things.



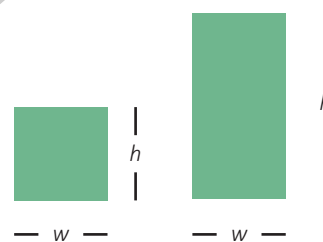
Proportion: The ratio of Height x Length x Width of an object. Have you ever tried to change the size, or scale, of an image on the computer, only to end up stretching it or squishing it strangely? This happens when you change the proportional ratio of the image.



Diagrams: Rebekah Lyons (KSU)



These two squares have the same **Proportions**, even though they are a different **Scale**. Their proportional (h:w) ratio is 1:1



These two shapes have different Proportions. The square has a proportional (h:w) ratio of 1:1, while the rectangle has a proportional ratio of 1:2

Did You Know?

A standard marble is ½" in diameter, and an average person is 5'-6". The average person is 132 marbles tall!



Glossary of Fundamental Design Vocabulary Continued

Ordering Principles: When we design a series of spaces, it's almost like we are composing a song or writing a book. Like any good composition, there is some semblance of Order and cohesion. A book must have a beginning, a middle, and an end. A song must use certain chords and rhythms to create order. Otherwise, art would be chaos. We can also use Order to create a beautiful and intentional composition of spaces. Here are a few methods:

Symmetry: Symmetry occurs when a mirror effect occurs on either side of an imaginary line over your composition. While we tend to be drawn to symmetry, this may not be the best tool for the overall composition of your marble enclosure, depending on your goal. Instead, try creating symmetry in an area of importance, while creating asymmetry elsewhere.

Axis: An axis can be a tool to inspire movement from one space or point to another. Typically, it is linear in nature and emphasizes the direction of movement. An axis is most powerful when it ends at a space or object which is important to the composition.

Repetition: Repetition occurs when one or more elements repeat in an intentional way. This tool can also be used to inspire movement, sometimes in combination with Axis.

Hierarchy: The establishment of importance. When designers establish spatial hierarchy, they might make one space larger than the other spaces near it, so that it feels more important. Another option is to consider the position of a space. One might put an important space in the center of all other spaces to give it importance. There are seemingly endless ways to establish the importance of your spaces. Can you think of a few more for your marble enclosure?

Additional Resources

Dezeen - <https://www.dezeen.com/tag/mazes/>

Center for Architecture - <https://www.centerforarchitecture.org/k-12/resources/design-a-marble-maze-using-scrap-cardboard/>

References

Center for Architecture. (n.d.). [Photograph of Marble Maze]. Center for Architecture. <https://www.centerforarchitecture.org/k-12/resources/design-a-marble-maze-using-scrap-cardboard/>

McGurk, M. (n.d.). *Listening to Joy* [Photograph of Structure Overview]. Dezeen. <https://www.dezeen.com/2022/01/09/yinka-ilori-creates-maze-of-colour-and-sound-for-va-dundee/>

Reeve, E. (n.d.). *MultiPly* [Photograph]. Ed Reeve. <https://editphoto.net/work-section/multiply-waugh-thistleton/>

Smythe, T. (2022, February 15). *5 Things You May Not Know About Marbles*. Corning Museum of Glass. <https://blog.cmog.org/2022/5-things-you-may-not-know-about-marbles>