

Marshmallow Architecture



Fun activities and ideas for kids.
With handy tips on how to promote learning through play.

Architecture is the design or character of a building or structure. An **architect** works to **design, plan, and oversee** the construction of buildings, bridges, and other structures. It is a very important job that requires a great deal of study to be able to do it properly. **Architecture is both an art and a science.** Architects use their creativity to design something that looks a certain way and performs certain functions. They also need to know about **scientific and mathematical principles**, to ensure the structure stays up!

Engineers use **math and science** to **come up with solutions to problems** that might arise with the construction of a building. They often need to overcome problems with **creative solutions** that have never been done before.

Let's get creative, as we experiment with architecture, engineering, and design!

Tips:

- Let your marshmallows get stale. Open your package and empty the marshmallows into a bowl and leave out for a couple days. Allowing them to get a little crusty will make them easier to work with.
- If desired, separate some of the marshmallows and place in an airtight container for snacking on as you're creating!
- This guide includes a variety of challenges, some for beginners and some for older youth. Complete as many challenges as you'd like!



Compiled from the following resources:

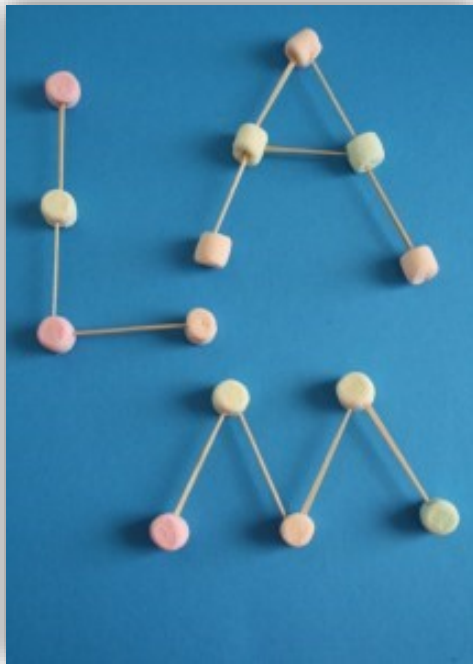
<http://brainbrigade.org/11-creative-marshmallow-and-toothpick-stem-challenges/>

<https://www.learnwithplayathome.com/2015/01/mini-marshmallow-and-toothpick-building.html>

Challenge #1—Create Letters

Let's get used to working with our materials (toothpicks and marshmallows). Work on connecting your marshmallows and toothpicks to make letters.

1. What letters can you make?
2. Can you spell out your name?
3. What other words or phrases can you create?



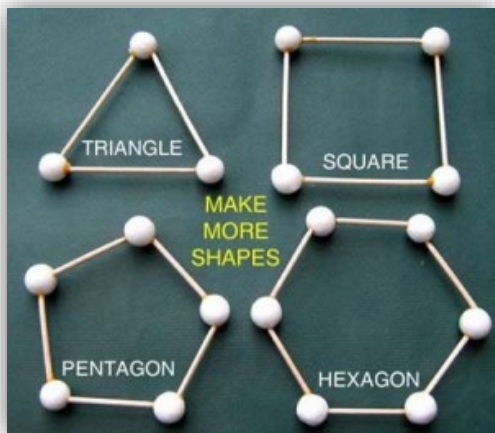
Source: Fantasticfunandlearning.com

Challenge #2—Create One

Dimensional Shapes

Architecture starts with shapes. When you look at buildings what kinds of shapes do you see? You might see squares, triangles or other kinds of shapes.

1. Try creating the below shapes with your marshmallows and toothpicks.



Source: arvindguptatoys.com

2. What other shapes can you think of? Draw (or have someone help you draw) each of the shapes below and then try to create them with your marshmallows and toothpicks.

Rectangle



Rhombus



Trapezoid



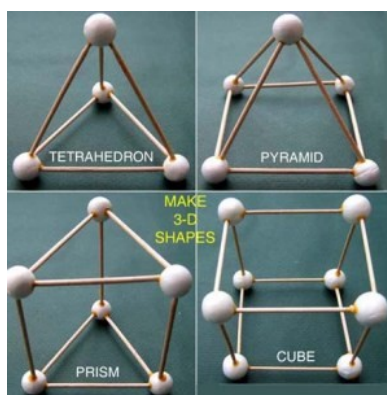
Challenge #3—Build Three

Dimensional Shapes

Shapes are the building blocks of architecture. However, in order to create a structure, you need to work with three dimensional shapes.

A **tetrahedron** is a three dimensional triangle. A **cube** is a three dimensional square. Does a cube look like the start of a house?

1. Try creating the below three dimensional shapes.



Source: Arvindguptatoys.com

2. Are there any other three dimensional shapes you can think of? Can you figure out how to create a three dimensional hexagon or pentagon? Draw a picture of what each one looks like below.

3D Hexagon



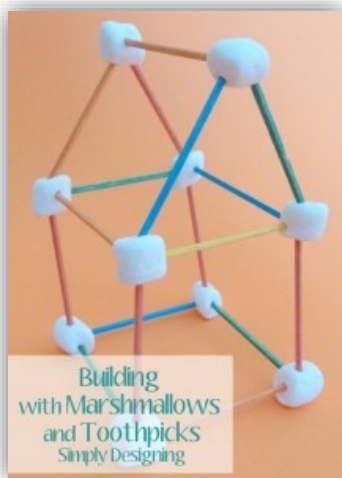
3D Pentagon



Challenge 4—Build a House

Buildings and structures are made by combining different three dimensional shapes. What 2, three dimensional shapes can you see below? The bottom of the house is a cube and the top is a prism!

1. Can you combine a cube and a prism to make a house?



Source: Simplydesigning.porch.com

2. What other shapes can you combine? Draw pictures of your creations below.



Challenge 5—Build a Tower

A tower is a very tall building or structure. It is often (but not always) the same shape built on top of itself.

1. Crate a tower with different three dimensional shapes.

How tall of a tower can you build? Use a ruler or tape measure to measure the height of your tower(s).

Shape—

Shape—

Height—

Height—

2. What 3D shape creates the best or most stable tower?

3. What can you do to add stability or strength to your tower, so it can be built even taller without falling over?



Source: Classroomfreebies.com

Challenge 6—Build a Bridge

A bridge is a structure that connects two areas together. Typically a bridge is built over a body of water, connecting two areas of land. Bridges can also connect buildings or be built overtop of roads or across valleys.



Deck

Source:

<https://newcastlebeach.org/explore/simple-bridge/>

Supports

How do bridges work? Bridges balance forces. A **force** is what make things move, but it can also hold things in place. **Gravity** is the most powerful force in the universe. It is always pulling things down. The **deck** of a bridge is what you walk or drive across and alone has no support to hold itself up. A structure or support must be built to balance the downward force of the deck, keeping it from falling down.

1. There are many types of bridges. See what structures you can build to help support your deck? Start with a short deck and see how long you can make it. What happens if you try to make your deck longer?



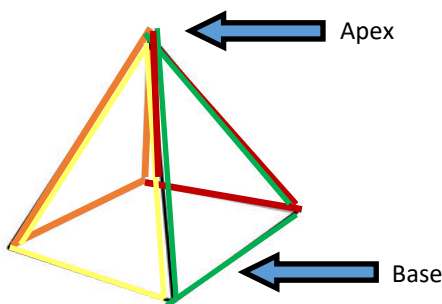
Source: Pinterest.com

Challenge 7—Build a Pyramid

You may think of Egypt when you think of pyramids. These man made structures date back thousands of years and many are still standing today!

A pyramid is made up of a base and 4 faces (or sides) that meet at an apex, or point at the very top.

Can you find each of the four colored sides of the pyramid?



1. Try building a pyramid for yourself. How tall you able to make your pyramid? _____



Source: Almostunschoolers.blogspot.com

Re-Create a “Famous” Building

There are many famous buildings, but architecture can also be right in your own neighborhood.

1. Take a look at the buildings where you live, maybe even one right outside your own window and try to re-create it's design. What shapes make up the building and how can you create them with the materials you have?
2. If you'd like, you can also look on-line for a famous building that is of interest to you. You might like to try to re-create:

- The Eiffel Tower, Paris, France
- The Space Needle, Seattle, Washington
- Empire State Building, New York City, New York
- Bellagio, Las Vegas, Nevada
- The Shard, London, United Kingdom
- Marina Bay Sands, Singapore, Malaysia

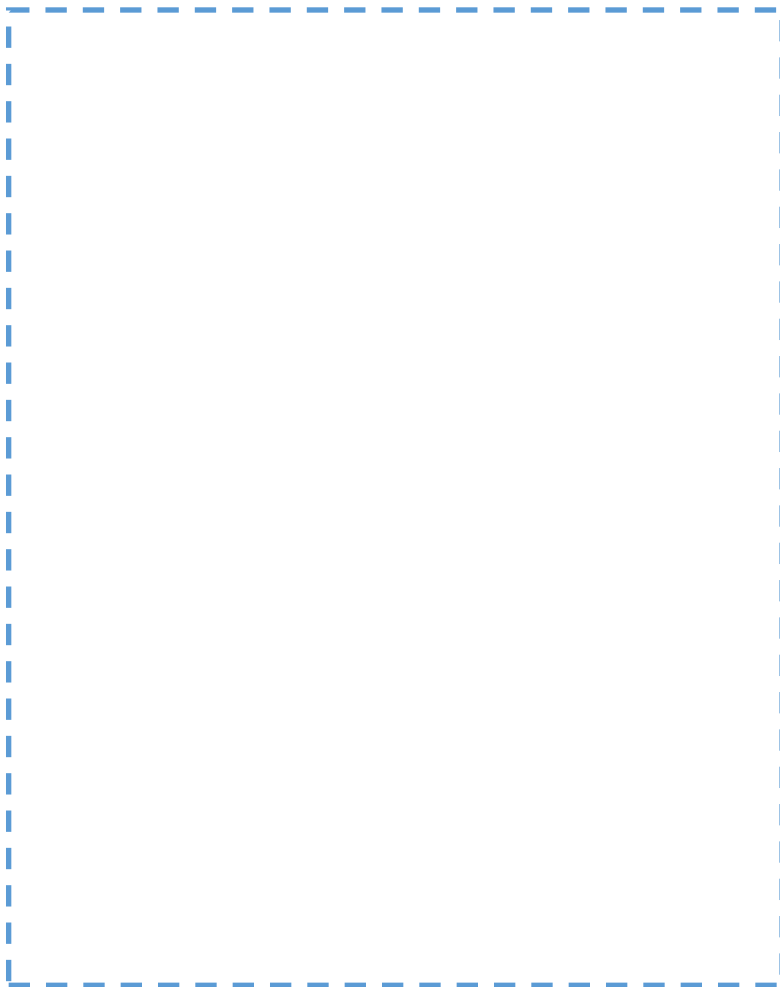


Create your own Design

Architecture doesn't have to be a building or a bridge, tower, or pyramid. It can simply be a sculpture that is significant to the designer.

1. Try your hand at using your creativity to design and build your own sculpture.

Draw a picture of your design(s) below.



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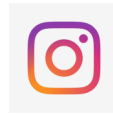
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