

**AT HOME**

**WITH VULCAN**

**FIVE STEM  
ACTIVITIES FOR  
KIDS**

**#LEARNINGWITHVULCAN**

# DESIGN AND CREATE YOUR OWN MONUMENT

Recommended grades: 2nd-5th

**Materials needed:** paper, pen or pencil, and clay or playdoh  
See family education's instructions for making clay at home

**Intro:** Vulcan has been the symbol of Birmingham for over 100 years, and we are proud to have him watching over us and reminding us to always look forward. Vulcan is a monument, which is a building or structure that is of historical importance or interest. Monuments are made to represent a specific person, group, or place. Vulcan was made to represent Birmingham.

Now, think of something that is important to you. Is it your family? Your home? Your neighborhood or community? If you could create a monument to represent something important to you, what would it be? Be creative! Take out your paper and pencil, and draw or describe what your monument would be and why you chose the figure or structure you did. Take as much time as you need.

2. Next, (this can be later the same day, or a different day) create your monument! Get out your clay or playdoh and sculpt your monument. Take a photo and post it online with the hashtag #learningwithvulcan

# AT HOME PLATE TECTONICS

Recommended grades: 5th-7th

**Supplies needed:** Wash cloths, cloth napkins, or towels of various colors

**Optional:** figurines or photos of fish, whales, crabs, snails or other water dwelling creatures, plants and/or trees, and local mammals to help illustrate the lesson below

**Intro:** Birmingham, and Alabama in general, is home to a huge variety of rocks and minerals, but how did they get there? This activity will help your student(s) understand 1) how the different layers of the earth came to be, and 2) how mountains and valleys form.

## **Activity:**

**Part 1:** Explain that different rocks and minerals underneath the ground are all made up of different amounts of plant and dead animal matter. As animals pass away and old plants are replaced by new ones, those things break down with the help of sun and rain, and eventually turn into rocks and minerals. The type of environment in the area at the time will determine what a particular layer is made up of. So, if the area was at one time a body of water, that part of the layer will be made up of fish and other water dwelling creatures and plants. If that same area was one time a forest full of trees, squirrels, and foxes, the layer will be made up those things. Different environments create different kinds of rocks and minerals. As the years go on, and the area continues to change, we wind up with many different layers of rocks and minerals. For example, iron ore, that is used to create iron, is primarily made up of decayed marine creatures, and coal is primarily made of decayed plants. Red Mountain, where we have mined lots of iron ore in the past, was once under water and that is why we find iron ore there!

# AT HOME PLATE TECTONICS, CONTINUED

**Part 2:** Show your students the image below, and explain that underneath each continent is something called a tectonic plate. Those plates occasionally move around, and when they move, they sometimes crash into one another. When they do this, pieces of those layers go up or down, and when they go up, mountains and valleys are formed.



Now, illustrate it! Take out your different colored cloths, and explain to your student that each color represents a different type of mineral that can be found under the Earth's surface. E.g., one color can represent iron ore (made of sea creatures), one color can represent coal (made of plant matter), and one color can represent limestone (made of shellfish and coral). Stack each cloth on top of one another, and then ask your student to place a hand on one side, while you place a hand on the other, and you both push inward, illustrating what would happen if a tectonic plate moved, and caused one continent to crash into another. Do you see how part of your cloth stack goes up? This is how mountains are formed!

# CONNECTING THE CITY: BRIDGES

Recommended grades: 2nd-4th

**Supplies Needed:** Toothpicks, marshmallows or gummy bears

**Intro:** This activity is all about connection. Explain that although Birmingham does not have any significant bodies of water, bridges are necessary in order to get around the city, especially in mountainous regions. Birmingham wouldn't have made it very long if the iron factories here weren't able to get their products to other cities and states to sell, so bridges are absolutely necessary.

1. Have students think about and draw and/or write a description of a bridge that they have seen or have ridden across. Include the different types of vehicles that might drive over it both today and 100 years ago.
2. Give your student(s) toothpicks and marshmallows, and tell them to use these items to recreate the bridge they drew/described earlier.
3. Take a photo and post it online with the hashtag #learningwithvulcan

# BUILDING THE CITY: CARD TOWER CHALLENGE

Recommended grades: 2nd-5th

**Supplies Needed:** 3x5 index cards Optional: tape and scissors, crayons/colored pencils/markers

1. Pre-Activity: Decide on the goal of your building challenge. Should your student(s) work to build the tallest tower they can? The most stable? The most creative design? Will you allow them to use tape, or not? If you choose to allow tape, measure only a 12" span for each student and let them carefully cut it up with scissors. Optional: Allow students to use crayons/pencils/markers to decorate their cards before using.

2. Distribute supplies to your student(s). Tell them that they are now engineers in charge of creating a brand new city, all out of cards! Explain the parameters based on what you decided you wanted your goal to be (height, stability, etc.) and set a timer. Have kids work to build their tower in a certain amount of time, around 5 minutes, review the results, and then start over again using what you've learned in the next round. After 2-4 attempts, talk to your student(s) about what worked and what didn't. Do some attempts working solo, and some in groups. Compare and contrast to see which way was easier or yielded better results. Why do you think this is so?

3. Talk to students about how Birmingham was built with the help of many different people, all working together with different skills. Point out that each person in the group had different skills, and that when those varying perspectives are brought together, it often yields better results.

# BUILDING THE CITY: CUBE TOWER CHALLENGE

Recommended grades: 2nd-5th

**Supplies Needed:** Provided cube template, scissors, tape or stapler, crayons/colored pencils/markers

1. Give students copies of the supplied 3D cube template and instruct them to color/draw on each square for the purpose of creating a 3D structure. Repeat many times until you have enough completed templates to make the size structure you want.
2. After a sufficient amount of time, instruct students to cut out template along the solid line (do NOT cut dotted lines).
3. Next, students should fold along the dotted lines, tucking the small flaps into the inside, taping or stapling the flaps to make a cube. Repeat with all templates.
4. Finally, make your structure! First, allow each student to use their individual cubes to create their own structures, then bring the whole group together (even if it's just parent and child), and combine your cubes to make one large structure, or many smaller ones to create a city.
5. Explain to students that building a city from the beginning, like Birmingham was built, is hard work and requires lots of people to pitch in and contribute. People contribute in many different ways and all have different styles and thoughts on how things should be done, much like the people doing this activity. This is how the city of Birmingham was made.

Many different people, all with their own ideas, coming together to make something new.

# Cube Pattern

Cut on solid lines - Fold on dashed lines

