

WHAT ARE WE INVESTIGATING?

How can you make a homemade volcano erupt?

MATERIALS:

- ½ cup salt
- ½ cup water
- 1 cup flour
- Food Coloring (optional)
- Bowl
- Spoon
- Empty Water Bottle or Cup
- Baking Soda
- Vinegar
- Dish Soap
- Pan (9x13 baking dish) or something to catch the mess
- Strive Academy's Engineering Design Process Handout (found at www.striveacademy.org)
- Pencil or Pen

EXTENSION:

* Use Google to investigate the different rock types - igneous, sedimentary, and metamorphic. Which of these rock types form from volcanic eruptions?

* Two common types of rocks that form from volcanoes are basalt and granite. Which of these rock types make up the majority of the continents? Which of these rock types make up the majority of the ocean floor?

* Check out this video: How do volcanoes erupt?
https://www.youtube.com/watch?v=xZ_CMUBJVl8

DIRECTIONS:

1. Gather all your materials. Our materials are just suggestions - feel free to add other things too!
 2. On your handout (found at www.striveacademy.org), fill in the title of your experiment (Homemade Volcanic Eruption).
 3. On your handout, fill in your hypothesis. You want to answer the question: What will happen to my volcanic eruption as I increase the amounts of baking soda and vinegar?
 4. On your handout, draw a design of what your volcano will look like. It may help to label the materials that you plan to use.
 5. The first step is to make the homemade playdough which will be used to form the volcano. In a bowl, mix together $\frac{1}{2}$ cup of salt, $\frac{1}{2}$ cup of water, and 1 cup of flour. You can add food coloring to the bowl (before you begin mixing) if you want to make your volcano a certain color. Mix with a spoon until the mixture forms a dough. Then you can use your hands.
 6. Build your volcano by molding it around an empty water bottle or cup. You want to mold it around something that you can put some materials in for the eruption. We suggest building your volcano inside of a baking dish or pan to help catch the mess.
 7. Under "Data Collection/Observation", draw a picture of your volcanic creation.
 8. In your empty bottle/cup inside of your volcano, add 1 tablespoon of baking soda and a few squirts of dish detergent. Optional: you can add a few drops of red food coloring to simulate red lava. When you are ready for your eruption, add $\frac{1}{2}$ cup of vinegar. **AGAIN, DO THIS IN A DISH OR PAN TO CATCH THE MESS!**
 9. Under "Results", record the amount of baking soda and vinegar that you put in and then a description of your eruption.
 10. Repeat steps #8 & 9 with different amounts of baking soda and vinegar. Under "Results", record how each eruption compares to the previous ones.
- II. Answer the "Analysis" questions on your handout:
- What was your best volcanic eruption? How much baking soda and vinegar were in this reaction?
 - Your experiment showed an acid/base reaction.. If baking soda is a good base, vinegar would be a good _____?
 - Since the baking soda and vinegar reacted to form new chemicals (carbonic acid and sodium acetate), would this be considered a physical or a chemical change?

**** Try the extension activities on the first page for more fun! ****