GEOLOGY

Volcanoes

Volcanoes

NGSS

4-ESS2; 5-ESS2

Objective

The student will understand the main parts of a volcano in addition to different types of volcanoes that exist.

The student will be able to demonstrate the main parts of a volcano by building a model.

Vocabulary

Magma Chamber: Chamber at the very bottom of a volcano where the magma is stored.

Conduit: Pipe that magma travels through to reach the top of a volcano.

Vent: Opening at the top of a volcano where magma comes out.

Crater: The area at the top of a volcano that surrounds the vent; normally looks like a large dent.

Magma: Melted rock.

Lava: Magma that has reached the top of the vent.

Background

There are 4 main parts to a volcano: the magma chamber, conduit, vent, and crater. The magma chamber is where magma is stored underneath the volcano; the conduit is the pipe where the magma moves to the top; and the vent is the opening at the top of a volcano where magma comes out. The crater is a large dent that surrounds the vent. Magma is molten (melted) rock stored in the earth's crust, which also makes up the lower mantle. Lava is magma that has reached the surface of the earth. There are 4 types of volcanos: cinder cone, lava dome, shield, and composite. The main differences between these volcanos are shape, size, and explosiveness. Cinder cones are the most explosive but are very small. Lava domes tend to become violent over

time - at first the lava seeps out and cools and dries around the vent, then explodes as pressure builds, sending the cooled lava flying. Shield volcanos are very wide, large volcanos, but tend to be non-explosive and instead the lava simply flows out like water. Composite volcanos tend to be very tall and skinny and are known to explode violently.

Materials

For each group (2-3 students):

- Markers and white boards.

Materials to build a volcano:

- Large bowl, small plastic bottle, 6 cups flour, 2 cups salt, 4 tablespoons cooking oil, 2 cups of water

Materials for eruption:

- 1 tbsp baking soda, 1 tbsp dishwasher liquid, 2 tbsp water, ½ cup vinegar, 1 tbsp red food coloring

Procedure

1. Discuss the main parts of a volcano with students.
2. Allow students to draw or write a description of how they will create a model with the materials they have been given on the white board.
3. Instruct the students to create their own model volcanoes with the materials provided. Mix the materials together to build the volcano in a large bowl. Then, take this 'paste' material and create the volcano around the small plastic bottle. Specify each element that the students should include in the model. Provide wait time for the volcano model to harden.
4. Have each group share about their respective model and identify each of the main components of their volcano.
5. Allow students to vote for the best model volcano (optional expansion – design a scoring rubric for judging).
6. After the vote has been made, allow the students to place all materials for the eruption inside the plastic bottle mouth, except for the vinegar.
7. Allow all students to pour vinegar at the same time to watch the volcano eruptions!

Guiding Questions

- What do you already know about volcanos?
- If you could choose the materials to create a model volcano, what materials would you choose for each part?
- How are volcanoes related to the state of Hawaii?
- Do you know of any volcanos? If so, which one(s)?

Career/Future Application

Geologist, Geographer, Volcanologist

Source

https://volcanoes.usgs.gov/vhp/about_volcanoes.html