

STEAM Subject: Geology
Lab: Volcanoes

Grades: 2nd-8th

Learning objective:

Students will be able to:

- discover how volcanoes are formed
- identify the 3 different types of volcanoes
- create a model of a volcano

ENGAGE:

Ask students the following questions:

- How are volcanoes formed?
- Where are volcanoes found on Earth?
- What are the different types of volcanoes?

EXPLORE:

Erupting Volcano Experiment

Materials needed per student:

- 8oz Water Bottle
- ½ cup White Vinegar
- Food Coloring
- Dixie Cup or Paper Funnel
- ¼ cup Baking Soda
- Tray or baking dish/pan
- Optional: paint, glue, glitter, permanent markers (with adult supervision) to decorate bottle

Procedure:

1. Bring the materials outside or put the bottle on a tray or baking dish/pan so the experiment is contained.
2. Combine the vinegar and approximately 4 drops of food coloring in an empty water bottle (option to decorate bottle before).
3. Measure baking soda into a Dixie cup or funnel.
4. Eruption time! Pour the baking soda into the water bottle with vinegar quickly and watch in awe!



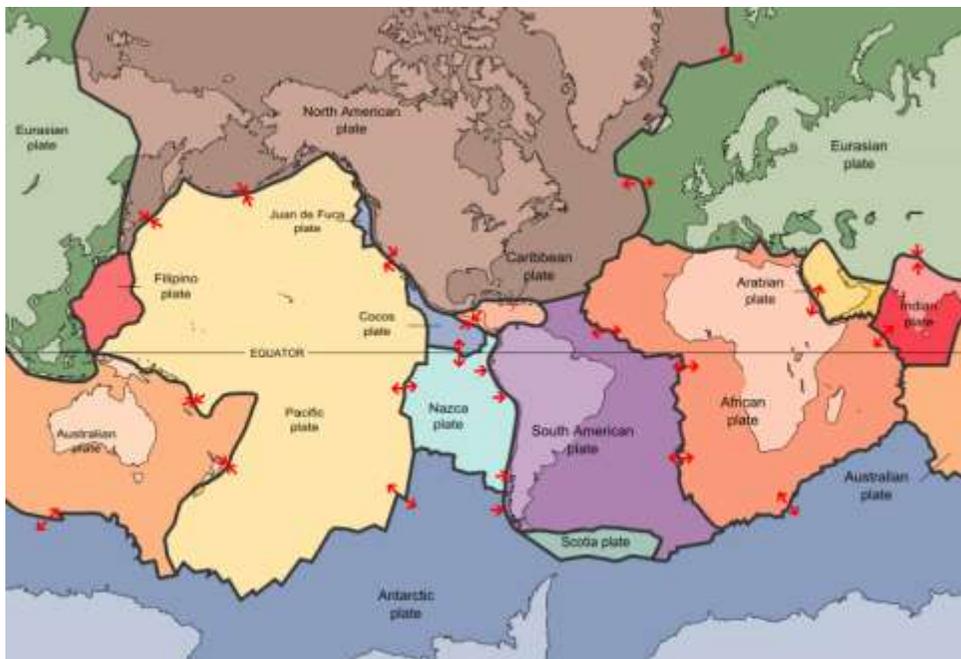
EXPLAIN:

Activity Discussion:

In this experiment, we created a 'volcanic eruption' through a chemical reaction between vinegar and baking soda. This chemical reaction created a gas called carbon dioxide (CO₂). You may be familiar with carbon dioxide already, because it is the same type of gas used to create the carbonation in soda. What happens if you shake up a can of soda? The gas gets very excited and tries to spread out. In our experiment there is not enough room in our bottle for the gas to spread out, so it leaves through the opening vent very quickly, causing an eruption!



The Earth is made up of four major layers: the inner core, outer core, mantle and crust. The crust is made up of solid rock, while the mantle below it behaves more like a liquid. This causes the crust on top to move and shift through a process known as tectonic activity. Take a look at the photo below, when these tectonic plates move away, towards or along another plate, they cause earthquakes and can form volcanoes!

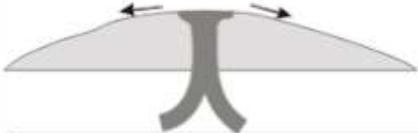


Have students watch the following two videos and encourage them to take notes on or draw out the information that is presented to them:

- Plate Tectonics Explained: <https://www.youtube.com/watch?v=kwfNGatxUJI>
- Geography Lesson: What is a Volcano? <https://youtu.be/WgktM2luLok>

What are the three types of volcanoes? *Shield, Cinder Cone, and Composite*
Shield Volcano

Shield Volcano



Lava comes out of the volcano and gently flows down the slopes

www.english-online.at/geography/volcanoes/vol...

A **wide dome shaped** volcano formed from **piled up lava flows**

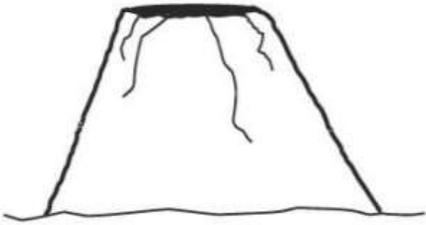
Example: Hawaii



These photos show Hawaii's shield volcanoes. Both are from Hawaii's big island, showing Mauna Loa (top) and a lava eruption (left).

Cinder Cone Volcano

Cinder Cone Volcano

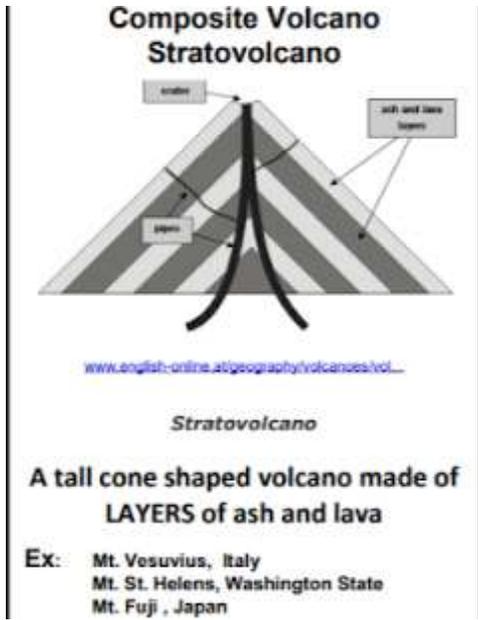


A **small volcano** formed from **small rocks, ash, and cinders.**

Examples: Capulin in Northern Mexico



Cinder Cone volcano at Lassen Volcanic National Park in Northern California.



Composite Volcano



Explosive eruption of Mount St. Helens on May 18, 1980 in Skamania County, Washington.

Review STEAM Vocabulary:

- **Cinder Cone Volcano:** smaller volcano (usually less than 1,000 feet tall) that often forms on the sides of larger, more complex volcanoes.
- **Composite Volcano:** also known as stratovolcano is a tall steep volcano that is formed by layers of lava, ash, and rock.
- **Mantle:** Slowly flowing layer of rock just below the Earth's crust.
- **Tectonic Plate:** Section of the Earth's crust that moves and interacts with other plates it is in contact with.
- **Shield Volcano:** Broad volcano with gently sloping sides.

EVALUATE:

Additional STEAM Activity: Using scissors, tape, markers, glue, and glitter, make your own volcano model using a template.

https://drive.google.com/file/d/1_GsQZP5RP71J255fj_bWgdbFiFJERNk2/view?usp=sharing

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