

BUBBLE & FIZZ

WEEK 3: VOLCANOES

EVER WONDER . . . IF VOLCANOES ERUPT UNDER WATER?



What we learned this week:

- ◆ A volcanologist is a scientist who studies volcanoes and tries to predict when they will erupt.
- ◆ A volcano is a place where magma, gases, and ash erupt through Earth's crust.
- ◆ A caldera is a large, circular depression at the top of some volcanoes.

Today's Experiments

1. Demonstrate a caldera.
2. Erupt a pocket volcano.
3. Erupt an underwater volcano.
4. Make a Pop Rocks® volcano.

Did you know?

- ◆ A volcanologist (also spelled vulcanologist) is a scientist who studies volcanoes. Volcanologists actually visit volcanoes and collect samples of ash and rock. They also study how lava flows. Their work helps save lives as they find ways to predict when a volcano will erupt. This way, they can warn people of the eruption and make sure that these people can leave the area.



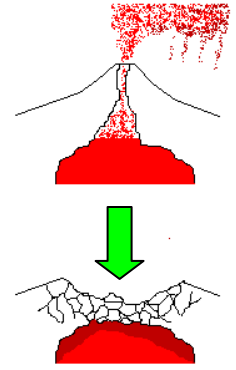
- ◆ A volcano is a place where magma (molten rock), gases, and/or ash erupts through the Earth's crust. When magma fills up a chamber inside the volcano, pressure builds up from the dissolved gases in the magma. When the magma begins traveling up cracks and fractures in the mountain and is released, along with hot gas and ash, it causes an eruption! We can look at a volcano as a closed bottle of soda with dissolved carbon dioxide gas inside. As long as the cap is on the bottle, the gas stays under pressure and dissolved in the soda. But, open the bottle and the gas expands and escapes, creating bubbles!



- ◆ Volcanoes can even erupt at the bottom of the ocean! As soon as the lava erupts out of this underwater volcano, it cools quickly in the ocean water. This forms something called "pillow lava," named because of its shape. There is a large underwater volcano in the Pacific Ocean, just off the island of Samoa, called Nafanua. As this volcano continues to erupt, layers of pillow lava are piling on top of each other, causing the volcano to grow very quickly. In fact, it has grown 1000 feet in the past 5 years alone. Although this volcano is still about 2500 feet below the surface of the ocean, at the rate it is growing, it may break the surface in less than 15 years, forming a new island.



- ◆ The Hawaiian Islands also were formed through volcanic activity under the ocean. In fact, the “big” island of Hawaii is made up of 5 different volcanoes: Kilauea, Mauna Loa, Mauna Kea, Hualalai and Kohala.
- ◆ A caldera is a large, circular depression, or crater, that forms when magma erupts from a volcano. This is created much like the caldera we demonstrated in the lab. When the balloon was full of air, the high air pressure was holding up the mountain. However, when we released the air from the balloon, the air pressure decreased, causing the mountain to lose its support and collapse on itself! In a real volcano, when hot magma and gases are released, the mountain may collapse on itself and create a caldera. Sometimes a caldera can even fill with water creating a lake! A well known example of this is Crater Lake in the state of Oregon.



Amazing Scientists

Maurice and Katia Krafft. The Kraffts were important volcanologists. This husband and wife team would often put themselves in real danger, standing only a few feet from hot lava to film volcanoes. Their work studying and taking pictures of volcanoes convinced governments to create evacuation plans for volcanic eruptions to make sure that people were safe. Unfortunately, the Kraffts perished while filming a volcano in Japan in 1991.

Curiosity @ Home

Design and erupt your own volcano at home. Materials: small empty water bottle, baking soda, vinegar, liquid dish soap, food coloring, water, flour, salt, bowl, spoon, tray. First, make a batch of dough (used last week for mountain models). To do this, add 1 ½ cups flour and 1 ½ cups salt to your bowl and stir. Next, add 1 cup water and mix. Your mixture should feel like bread dough. Add a little more water if needed. Use the dough to mold a volcano around the soda bottle. Make sure you don't cover the hole at the top—this is where the eruption will happen! Add ¾ cup water, 1 Tbsp. baking soda and 1 tsp. dish soap to the soda bottle. Then add several drops of red food coloring. Pour in vinegar until your volcano erupts!

Word Scramble

Can you unscramble these words from today's class?

ALCADER

_____ (depression at the top of some volcanoes)

OLOCNAV

_____ (place where magma and gases erupt)

GAMMA

_____ (molten rock beneath Earth's crust)

FATKRFS

_____ (a husband/wife team of volcanologists)

WILPOL VLAA

_____ (lava that erupts from underwater volcanoes)

PERUNTIO

_____ (what happens when lots of pressure builds up in a volcano)

RACTRE

_____ Lake is in Oregon; it is a water-filled caldera)

AIHIAW

_____ (A U.S. state that was formed through volcanic activity)