

Gases – Expanding Possibilities!

Magma is made of melted rock and dissolved gases deep inside the earth. It is the gases in magma that under certain circumstances can cause a volcanic eruption. Yes, gas has the power to blow a hole through a mountain! Try this activity to see how increasing pressure affects gases. Since you can't tunnel through the earth for this activity, you will increase pressure by warming the air inside a bottle.

Materials:

- Empty ½ liter plastic bottle
- Plastic cup
- Flexible straw
- Clay
- Room temperature water
- Hot tap water
- Bucket or tray



Procedures:

1. Place the straw in the bottle so that the flexible end is sticking out. Squeeze the clay tightly around the straw and the mouth of the bottle to make an airtight seal.
2. Fill a cup about ¾ full of water. Bend the flexible end of the straw, so that you can place the end of the straw in the water while holding the bottle over the tray or bucket, tilted downward as shown below.



3. Hold the bottle near the top end while a partner pours hot tap water over the bottom end of the bottle.
4. Watch the end of the straw in the water. What do you notice? If you see bubbling, what do you think caused it?

Think about this ...

In this activity, the warmth from the water moves into the air inside the bottle. The pressure inside the bottle increases causing the gas to push on the air in the straw. It even pushes on the water in the cup. This is what happened when you saw the bubbles in the water. Inside the earth, the gases in magma push on layers of solid rock. What might happen if the layers of rock can't take the pressure?

Where's the Chemistry?

When magma is very deep inside the earth, all the layers of rock above it push down. Magma pushes on the layers of rock too. As magma moves closer to the surface, fewer layers of rock push down. Like the expanding air in the bottle, the gases in magma expand as much as the rock will allow. Near the surface, the pressure can be so great that the gases in magma can bend and even break solid rock.



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The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

