

# GEYSERS SPOUT AND ROAR

*A great volcano dreams beneath the earth's surface.  
Fiery magma forms the giant's heart.  
Rainwater slips down through cracks and fissures.  
The magma heats the water, sending it steaming  
back up, up, and up. —VOLCANO DREAMS*

In this description of a geyser in Yellowstone, heat is turning the water into a gas. What is the gas form of water? Steam! The gas or steam takes up more and more space in the fissure until it is forced back up the fissure to the surface. Whoosh!

*Steam vents hiss and gurgle.  
Geysers spout and roar. —VOLCANO DREAMS*

Let's try and see what this amazing process looks and feels like. We will use a simple chemical reaction to simulate the boiling water becoming steam under pressure. Why the simulation? Because real steam can burn you!

## TOOLS TO GATHER:

1. Very warm water

*This simulates heated rainwater.*

2. Small bottle with narrow neck

*The narrow neck simulates the fissure leading to a lower chamber in the rock or the lower part of the bottle.*

3. Liquid dish soap

4. Alka-Seltzer tablets

*The tablets will release carbon dioxide gas into the soapy water, making bubbles and foam. This simulates water becoming gas or steam.*

5. Large tub or sink

6. Towels for clean-up

*These two things will help contain the chemical reaction.*

## STEPS TO TAKE:

1. Fill the bottle almost to the top with very warm water.

2. Add a few drops of liquid soap.

3. Set the bottle in a large container or sink.

4. Break the Alka-Seltzer tablets up into small pieces on a piece of paper. (cont.)

# VOLCANO DREAMS

This activity is based on the picture book by Janet Fox and illustrated by Marlo Garnsworthy (Web of Life Children's Books) and inspired by the Geyser Riser activity produced by AAAS.



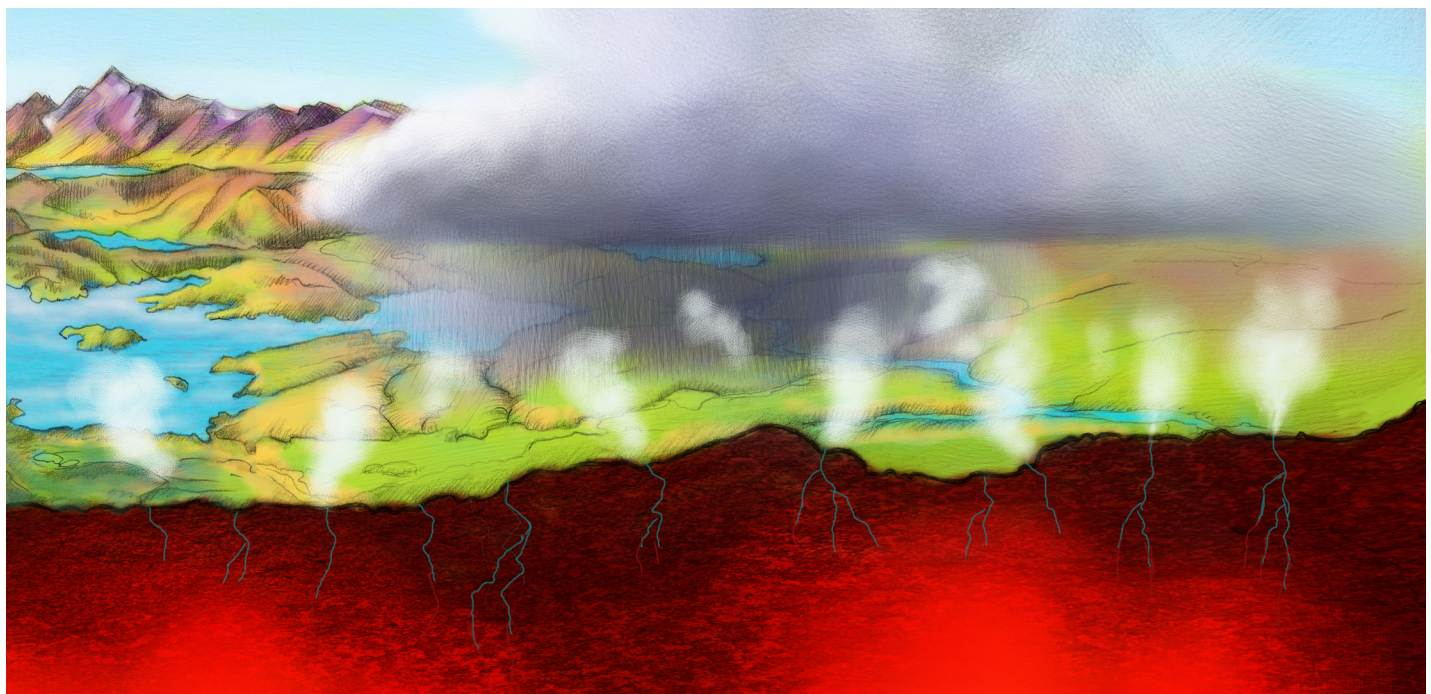


Image © Marlo Garnsworthy

## STEPS TO TAKE (CONT.):

5. Gently lift either end of the paper and funnel the Alka-Seltzer bits into the bottle.

6. Quickly and firmly cover the top of the bottle with the palm of your hand.

You now have simulated rainwater heated in a fissure in the earth. What will happen next?

Do you feel a pressure under your hand? Does the pressure increase or decrease?

7. Pull your hand away quickly.

What happens when the pressure is released? Is there a sound? What do you think makes the sound? How is this like a geyser?

8. Repeat the experiment and vary the amount of soap or tablets. How does the reaction change?

**CALDERA** is a large crater-like depression that is created when an emptied volcano collapses in on itself after erupting. —**VOLCANO DREAMS**

## THERMAL FEATURES OF YELLOWSTONE

Yellowstone National Park is home to thousands of thermal features like geysers and hot springs. The thermal features are there because Yellowstone is actually an immense volcano—even though it does not have the cone-shaped mountain we usually associate with volcanoes. All we see of the volcano are the thermal features and **caldera**, but deep beneath the park is a huge magma chamber.

When the Yellowstone volcano erupts it is so large and explosive that we call it a “supervolcano.” The Yellowstone supervolcano is now dormant (currently inactive). The most recent eruption happened about 640,000 years ago, and the 1,500-square-mile Yellowstone caldera was formed when the volcano collapsed.

The mud pots, hot springs, geysers, and steam vents are made when rainwater that is superheated by the Yellowstone magma chamber. Algae that lives in the hot springs and geysers creates brilliant colors. Geysers like Old Faithful can shoot thousands of gallons of water up to hundreds of feet in the air with each eruption. —**VOLCANO DREAMS**