NATIONAL SCIENCE EDUCATION STANDARDS

A. Science as Inquiry

Abilities necessary to do scientific inquiry
Understanding about scientific inquiry

B. Physical Science

K–4

Properties of objects and materials

- Objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react to other substances. These properties can be measured using tools, such as rulers, balances, and thermometers.
- Objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects or materials.
- Materials can exist in different states—solid, liquid, and gas.

5–8

Properties and changes of properties in matter

- A substance has characteristic properties, such as density, a boiling point, and solubility, all of which are independent of the amount of the sample.
- Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties.

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CONTENTS

TYPES OF VOLCANOES

Cinder cone volcanoes are the simplest type of volcano. They are very common. Gas-charged lava is blown into the air from a single **vent**. It forms bubbly rock as it cools in the air. This falls as cinders—ashes and burned rock. As the cinders fall to the ground they form a cone-shaped mountain.

Cinder cone volcanoes, such as El Parícutin, in Mexico

Shield volcanoes, such as Kilauea (pronounced *Kee-lau-way-uh*), in Hawaii

But there are many different types of volcanoes. Two other common types are shield volcanoes and composite volcanoes. Shield volcanoes are built up by flowing lava. Composite volcanoes are built up by alternating layers of cinders and lava.

How explosive and dangerous a volcano is depends on what's inside—the chemistry of the volcano.

Composite volcanoes (also called stratovolcanoes), such as Mount Fuji, in Japan

Make an Eruption

You can make a model of a volcanic eruption.

You will need:

- tape
- a small plastic cup
- a square piece of card stock
- newspaper
- a camera (**optional**)
- 2 drops of red food coloring
- 1 drop of dishwashing liquid
- 1 teaspoon of baking soda
- 2 tablespoons of vinegar

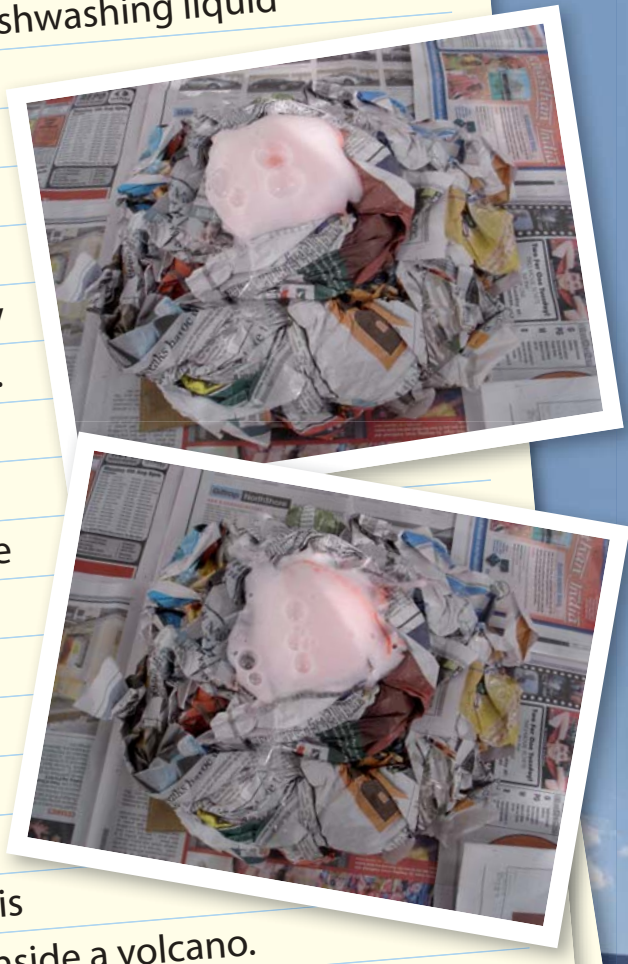
What to do:

1. Tape the cup with the opening facing up to the middle of the card stock.

2. Crumple up some newspaper and pack it around the cup.

3. Build up the crumpled newspaper into the shape of a volcano, leaving a hole in the middle.

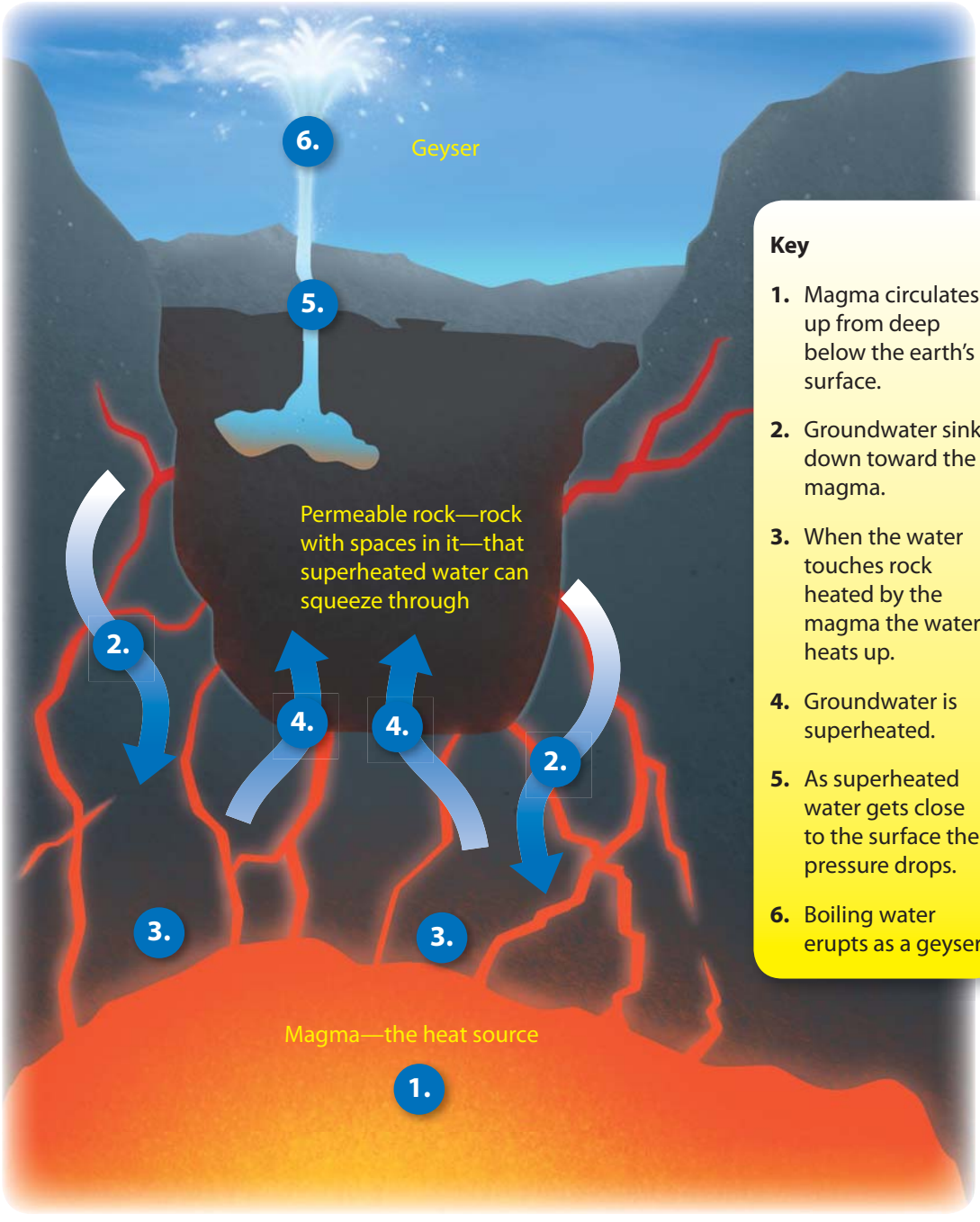
4. Tape the crumpled newspaper into place.
5. Cover the floor with more newspaper!
6. Get your camera ready!
7. Mix the food coloring and dishwashing liquid together in the cup.
8. Add the baking soda.
9. Slowly pour the vinegar in to make "lava."
10. Stand back—and get ready to take some photographs.



Show your friends:

Show your photographs of the "eruption" to your friends! The red "lava" is the result of a chemical reaction between the vinegar and the baking soda. What your eruption doesn't show is how the pressure changes inside a volcano. That would be too dangerous to model!

How a geyser works



Key

1. Magma circulates up from deep below the earth's surface.
2. Groundwater sinks down toward the magma.
3. When the water touches rock heated by the magma the water heats up.
4. Groundwater is superheated.
5. As superheated water gets close to the surface the pressure drops.
6. Boiling water erupts as a geyser.