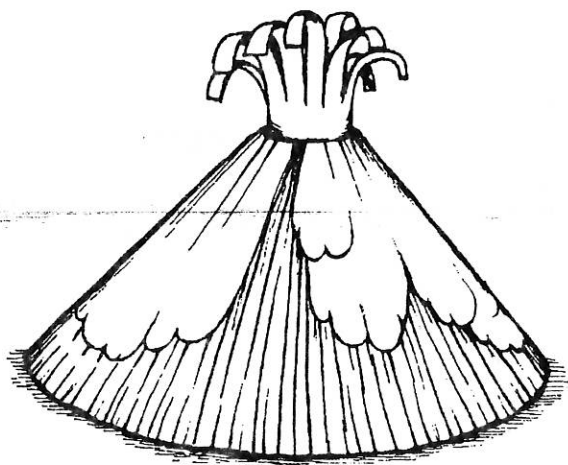




Volcano!



Grow a Volcano

This model demonstrates how a volcano can grow into a mountain.

SCIENCE CONCEPTS & OBJECTIVES

- Observe how volcanoes can grow into mountains
- Identify what comes out of a volcano
- Infer that a volcano can erupt anywhere

VOCABULARY

cone a hill or mountain of ash and hardened lava built around a volcano's opening

lava melted rock that flows from a volcano

volcano an opening in Earth's crust where magma can escape

For Your Information

A volcano erupts when molten rock and gases—called *magma*—spew through a crack in Earth's crust. This mostly happens where Earth's moving plates open up cracks and weak spots in the crust. But volcanoes can form anywhere there's a break in the crust, and there's no known way to prevent them.

When a volcano erupts, the gases escape into the air, and the liquid rock—now called *lava*—pours out. Spewed lava, cinders, and ash build up in layers around a volcano's opening and form a *cone*. These cones can grow into mountains over time.

TEACHING WITH THE MODEL

Grow a Volcano

1. Ask students: What is a volcano? What comes out of it? Has a volcano ever erupted near where you live? Could it? What would happen if one did?
2. Assemble the model's parts (see page 16).
3. Build the volcano (or have students build theirs) as you read the true story, *Birth of a Volcano* (reproducible page 18), to the class. Cues next to the story tell students when to add another cone on top and when to insert the fiery shower of lava plume. The volcano will appear to "grow" with the story as it keeps erupting and spewing out lava.
4. Following the story, check comprehension by reviewing the questions in step 1.



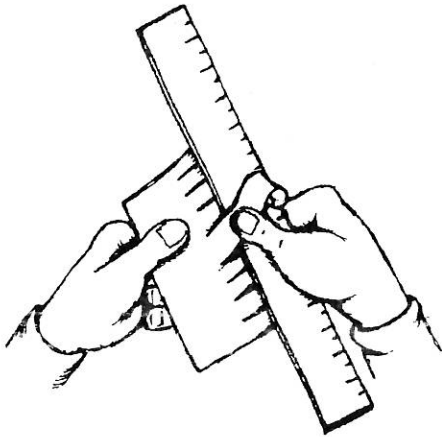
Making the Model



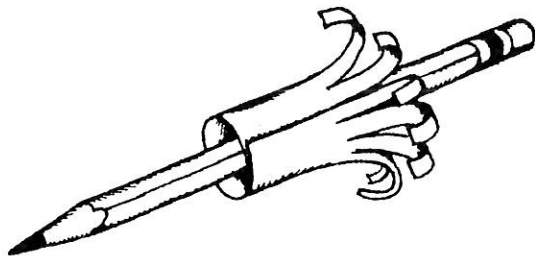
Grow a Volcano

MATERIALS: reproducible pages 19 and 20 ● scissors ● ruler ● tape ● crayons, colored pencils, or markers (optional)

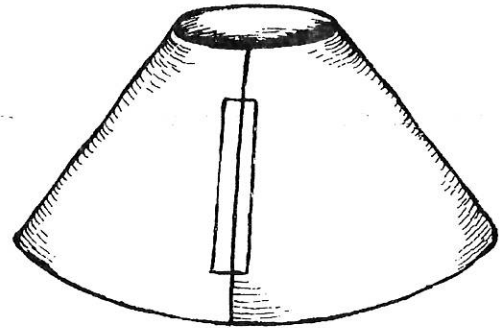
1. Photocopy pages 19 and 20.
2. Cut out the four pieces. Color them, if desired.
3. Cut the ends of the square piece, the LAVA PLUME, along the heavy black lines. Curl the paper strips by pulling each tightly over the edge of a ruler or the blade of blunt scissors.



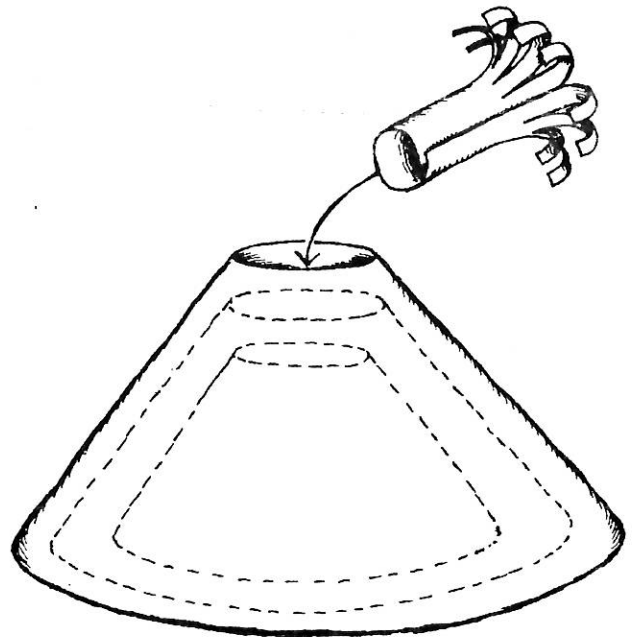
4. Next, roll the LAVA PLUME into a cylinder with the curled strips facing out. Wrapping it around a pencil, as shown, helps. Set it aside.



5. Tape each of the other three pieces into a cone, as shown.



6. To model a growing volcano, stack the three cones one on top of the other and then insert the plume into the hole at the top.





EXTENSIONS

HANDS-ON

Lumps of Lava

Students discover how the thickness of a liquid affects the shape it makes.

The shape a volcano takes is in part determined by how thick the lava is. Students can discover this for themselves by building volcano mountains out of runny and thick flour paste.

MATERIALS: flour • water • bowls • spoons • plates

1. Make two separate pastes by mixing flour and water in bowls. Make one the consistency of gravy and the other as thick as possible without becoming dough.
2. Invite students to build mountains by dripping spoonfuls of each paste onto two separate plates. Which "lava" makes a gently sloping shield cone volcano? (*runny paste*) Which makes a steeper cinder volcano? (*thick paste*) Which kind of volcano is Paricutin? (*steeper cinder cone volcano*)—

HANDS-ON

Magma on the Move

Students observe how magma under pressure pushes out of the ground through volcanoes.

Hot magma under Earth's surface is under pressure. Sometimes it pushes up from underground through a volcano, changing Earth's surface. This demonstration simulates this process.

MATERIALS: tube of toothpaste, half full • pin

1. Place the tube of toothpaste (with the cap

on) on a desk. Ask students to imagine that the tube is the surface of Earth. The toothpaste inside is the hot, melted magma underground.

2. Distribute the toothpaste evenly in the tube. Then use the pin to make a tiny hole near the bottom. Ask students what the hole might represent. (*a volcano's opening*)
3. Press down on the tube near the cap. Ask students what this action might represent. (*magma under pressure*) What happens? (*The magma oozes out of the volcano.*)

COOPERATE AND CREATE

Classify Volcanoes

Students work in groups to investigate the different kinds of land-forming volcanoes.

Challenge student groups to research and make a poster of one of the three different kinds of land-forming volcanoes: cinder cone volcano, shield volcano, and composite volcano (a mixture of cinder cone and shield). Invite them to draw diagrams on their posters showing the volcano's characteristics as well as feature famous volcanoes that belong to their category.

RESEARCH IT

Related topics for research reports or projects:

- How was the birth of the island volcano Surtsey off Iceland's coast in 1963 similar to the birth of Paricutin? How was it different?
- Not all volcanoes erupt and fall back asleep. The volcano Stromboli has been spitting out lava about every 20 minutes for hundreds of years. Why?
- The word *volcano* comes from the Roman god Vulcan. Why?

Birth of a Volcano

One day in 1943, a Mexican farmer heard a loud rumble. He felt the earth shake and saw a large crack open in the ground. As smoke and hot gas spewed from the crack, the scared farmer ran to alert everyone in his village of danger.

That night, red-hot glowing rocks shot out of the crack. So did hot powdery ash. They piled up around the crack, forming a cone-shaped mound. (1)

The mound grew and grew. By the next afternoon, the cone was as high as a 12-story building. (2)

A volcano was born.

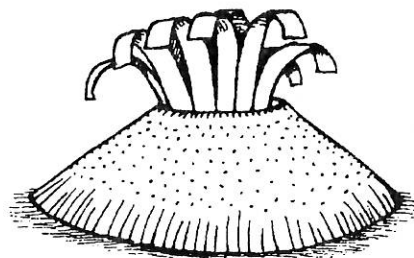
For weeks, hot rocks, ash, and gases kept shooting out of the growing volcano named Paricutin (pah-REE-coo-TEEN). Many trees caught fire, and layers of ash covered nearby homes and fields. One day, fiery hot lava started pouring out of the volcano. The lava destroyed everything in its path and buried the farmer's village a mile away. As the lava cooled, it hardened into solid rock. By the end of the year, Paricutin stood almost 1,000 feet (300 meters) high. (3)

A river of lava flowed out of the volcano, burying a town five miles (eight kilometers) away. While all the villagers fled to safety, only the church bell towers stood unharmed above the lava. After nine years, Paricutin stopped rumbling. (4)

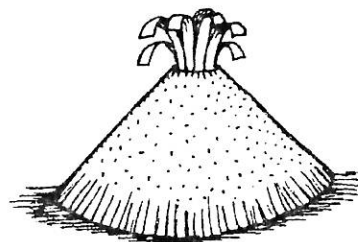
No one knows if it will ever erupt again.

MODEL CUES

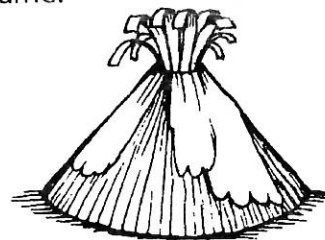
1. Set down the smallest cone of ash and insert the lava plume.



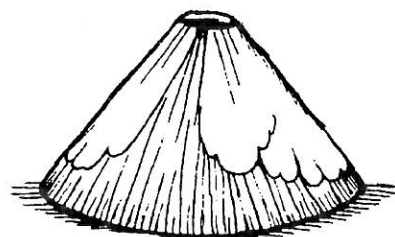
2. Remove the lava plume. Top the small cone with the midsize cone of ash and reinsert the lava plume.



3. Remove the lava plume. Add the final large cone of lava and ash to the stack and reinsert the lava plume.



4. Remove the lava plume.



GROW A VOLCANO

