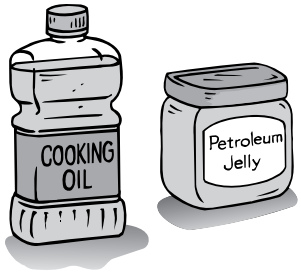
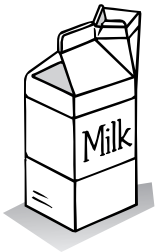
Chapter Science Investigation Name _____

Modeling How Fossils Form

What You Need



cooking oil or petroleum jelly

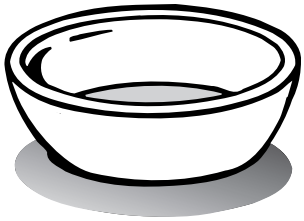


1-liter milk or cream carton

2 L of plaster of paris

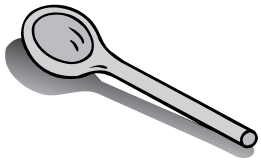
12 g of modeling clay

tempera paints (red and yellow)

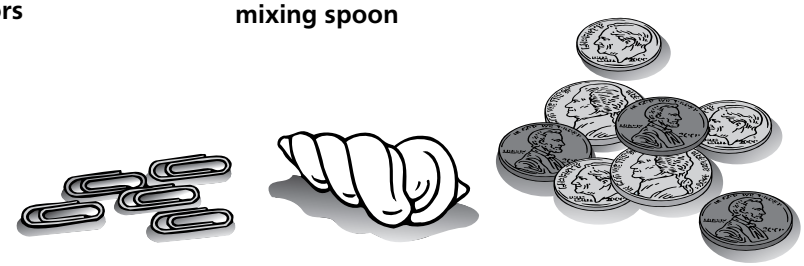


plastic mixing bowl

scissors



mixing spoon



coins, paper clips, seashells, small plastic items

Find Out

Do this activity to learn how fossils form.

Process Skills

- Constructing Models
- Observing
- Measuring
- Communicating

Time

- 40 minutes the first day
- 30 minutes every other day for two weeks

What to Do

1. Begin **making the model,** which will represent layers of rock formed under water over millions of years. Cut the top of the milk carton off. Cover the bottom of the carton and the lower half of all the sides with oil.

2. Cover several coins with oil and place them in the container.

3. Mix one cup of plaster of paris with water. Follow the directions on the container. Add a little red paint to color the plaster. Pour it in the container and let it dry for two days.

4. Cover the hardened plaster with 1 cm of clay.

5. Cover the clay and the sides of the carton with oil. Cover the paper clips with oil and place them on the clay.

6. Mix one cup of plaster of paris as before, but add yellow paint to it. Pour it over the red layer and let it dry for two days.

7. Cover the yellow plaster with 1 cm of clay.

8. Cover the clay with oil and add shells covered with oil on top of it.

9. Mix one cup of plaster of paris as before, but add no color to it. Pour the mixture over the shells. Allow the plaster to dry.

10. Cover the plaster with 1 cm of clay.

11. Cover the clay with oil and place several small plastic items coated with oil on the clay.

12. Mix the plaster, and add red paint this time. Pour this over the plastic items and let it dry for two days.

13. Carefully cut or tear the carton away from the clay and plaster of paris, keeping the layers together.

14. Carefully pull the layers apart, take out the items, and discover the fossil imprints. **Draw** pictures of the fossil imprints.

Fossil Drawings

Conclusions

1. How do animal and plant fossils form?

When water animals died, their shells or skeletons remained on the ocean floor, and as more sediment formed layers over them, they fossilized. Later, over millions of years, Earth's pressure under the ocean floor pushed it up to form mountains and other land features. The fossils were then found high above sea level. When land animals and plants died, they became fossilized and were covered with layers of matter on land.

2. How does this help scientists learn about once-living animals and plants?

Sedimentary rock layers that contain fossils like those in the Grand Canyon are evidence of a time line of living organisms on Earth. The fossils found in the lowest layers are oldest, and those at the highest layer are the most recent.

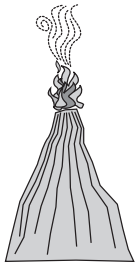
New Questions

1. Earth looks like it never changes. Do fossils found high in the mountains show otherwise?

Yes, if the fossil of an animal living at the bottom of the sea is found in rocks above sea level, the rocks must have moved.

2. Why must archaeologists dig carefully when looking for fossils or fossil imprints?

The archaeologists do not want to damage the fossils.



Name _____

ACTIVITY

Making a Model of Earth's Layers

Use the space below to **draw** a picture of your **model** of Earth.

Write graham cracker, banana, and peanut butter or cream cheese beside the different layers you draw.

Name _____

Conclusions

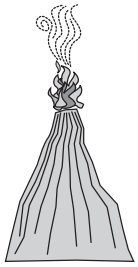
1. Which layer did the graham cracker represent?
Earth's crust

2. Which layer did the banana represent?
Earth's mantle

3. Which layer did the peanut butter or cream cheese and the nut represent?
the two innermost layers of Earth; the inner and outer cores

Asking New Questions

1. Where do you think materials in the layers of the Earth come from?
Accept any logical answers. Some students may know that the materials that make up Earth's layers come from intergalactic matter.



Name _____

ACTIVITY

Moving Ice

How does the cornstarch mixture move on wax paper?
It should spread out slowly in all directions.

Add more of the mixture to the center of your glacier.
How does the glacier move?
The glacier model should spread out even more when the mixture is added.

Add mixture to the center of your glacier. Stop when the edge of the glacier is 3 cm from the edge of the paper. **Draw** your glacier. In your drawing, show where the glacier is thick and where it is not so thick.

Draw what you see when you turn the glacier over. Show the sand and soil particles in your drawing.

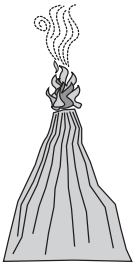
Name _____

Conclusions

1. What happened to the glacier model as it flowed over the sand and soil?
   The sand and soil were covered by the glacier. Some of the loose particles were carried or pushed along by the glacier's flow.

Asking New Questions

1. How could you set up the model to see how a glacier might behave when it reaches a mountain?
   A model mountain could be made out of clay or a pile of sand. The glacier could then flow against it.



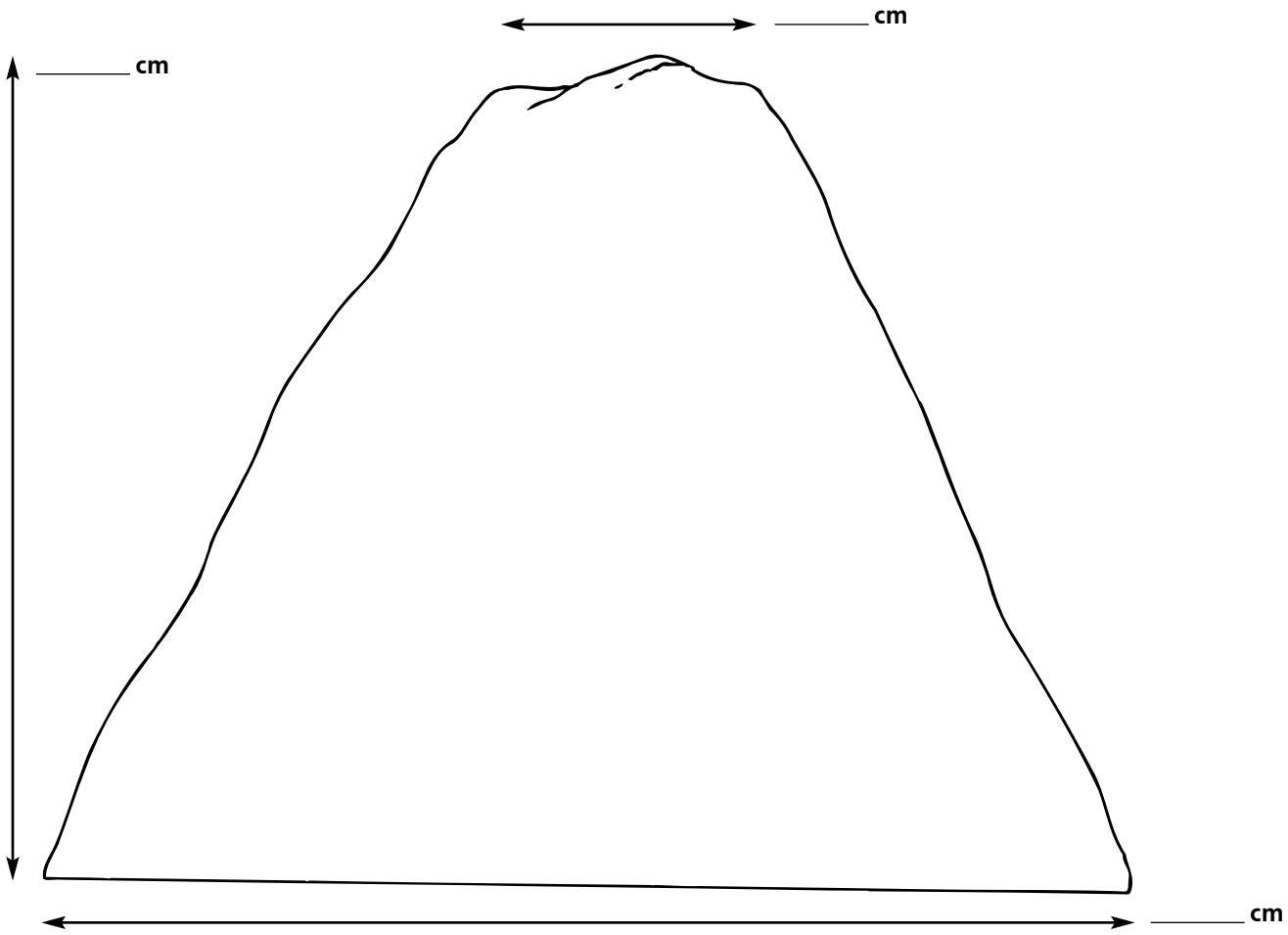
Name _____

ACTIVITY

Modeling How Maps Show Elevation

How big is your mountain? **Measure** the base and the top. How high is your mountain? **Record** your measurements on the drawing below.

Measurements will vary.



Name _____

Conclusions

1. Describe the map you made.
Answers may vary. Students' work should show that the map represents elevation.

Asking New Questions

1. How did you show elevation on your map?
Elevation was represented by concentric rings.

2. How can you use a topographic map to determine the height of the mountain?
Elevation at the base of the mountain should be subtracted from elevation at the top of the mountain.