

ICE FLOWS



BENCHMARKS and TASKS

SC.D.1.2.4 The student knows that the surface of the Earth is in a continuous state of change as waves, weather, and shifts of the land constantly change and produce many new features.

SC.D.1.2.5 The student knows that some changes in the Earth's surface are due to slow processes and some changes are due to rapid processes.

- The student investigates how waves, wind, water, and ice shape and reshape the earth's surface by eroding rock and soil in some areas and depositing them in other areas to form new features.
- The student experiences how some changes in the earth's surface are due to slow processes, such as erosion and weathering; and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

KEY QUESTION

How do glaciers reshape the earth?

BACKGROUND INFORMATION

In the far north and south, the temperatures are well below freezing. There are ice caps at both the North and South Poles. Glaciers – rivers of ice – also form in high mountains at lower altitudes. When water freezes inside a valley, a glacier is formed. Glaciers flow, or move, very, very slowly. The glaciers carry rocks and sediments of various sizes. The rocks and sediments within the glacier scrape and gouge out the landscape, forming lakes and valleys.

MATERIALS

Per group

wet sand
1 rectangular pan
pebbles
1 quart-size milk carton
regular ice cubes
aluminum foil
newspaper

Teacher

pictures of mountain glaciers
pictures of land carved out by glaciers

TEACHING TIP

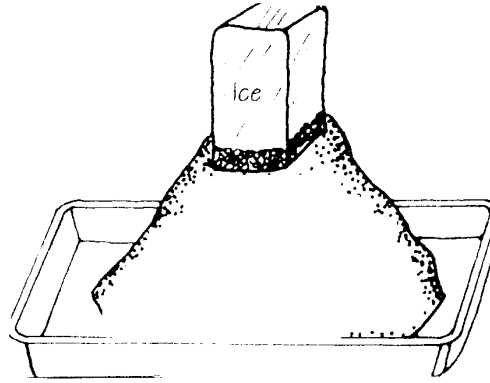
Prior to the activity, gather enough milk cartons for each group. Cut open the top of each milk carton. Add enough sand and pebbles to just coat the bottom of the carton. Add water to the carton and freeze. This will represent the glacier. Empty the ice blocks (glaciers) out of the milk cartons just minutes before the children build their mountains.

ENGAGE

1. Show children a picture of a mountain glacier. Ask them if they know what it is. Explain that a glacier is a river of ice, formed when water freezes inside a valley.
2. Show children pictures of land that has been reshaped by glaciers. Ask: *How can a glacier cause these changes to the land?*

EXPLORE

1. Have students cover the work area with newspaper.
2. Then have students build a small mountain of wet sand inside the rectangular pan.
3. Explain to the students that the sand represents a mountain before glacier formation.
4. Turn the ice block (glacier) upside down on top of the sand mountain so that the frozen pebbles are on top of the sand mountain. The block of ice with pebbles frozen in it is a miniature model of a glacier. Glaciers often have rocks or boulders frozen in them.
5. Have students observe what happens as the ice begins to melt and flow down the mountainside.



EXPLAIN

What did you observe as the glacier started melting? (The smaller particles of sand were carried down from the top with the water that melted.)

What happened to the rocks frozen within the glacier? (Some pieces came loose, but heavier pieces tended to stay higher up. They usually fall out of the liquid right away, unlike the smaller particles of sand and rock that are carried away with the melting stream.)

What happened to the sand mountain as the glacier flowed (ice melted)? (The mountain's shape changed. As the glacier melted, the smaller particles of sand were carried down from the top with the water that melted from the top of the glacier where the air was warmer.)

EXTEND/APPLY

Have students slide an ice cube (without sediment) around on foil. Observe and discuss how easily it slides without leaving marks on the foil.

Then have students place the model glaciers with pebbles in the base on the foil and slide them around. Observe and discuss what happens. Can the glacier be moved around on the foil without damaging it? This is how the rocks and sediment within the glacier scrape and gouge out the landscape, forming lakes and valleys.

EXTENSION

Report on glaciers that exist in America.