



Glacier Goo

materials

- 1 bag of glacier goo*
- 1 tray
- 1 book or object to raise tray
- Toothpicks
- Rocks
- Index card or piece of cardboard
- Timer
- Marker

background

Glaciers are slow-moving masses of ice that exist where more snow falls than melts. They occupy about 10% of the Earth's land, mostly in Greenland and Antarctica. Here, glaciers can be as much as 2 miles thick and weigh more than millions of tons. As they move, glaciers can widen and deepen valleys, flatten forests and grind boulders into pebbles.

Gravity drives glaciers in 2 ways: by sliding over the bedrock with melt water and by ice building up in the middle, forcing the edges to expand. In the Polar Regions, glaciers are frozen to the bedrock and move very slowly, from 30 feet to a half mile each year. During a surge, glaciers can move as much as 250 feet per day for several years before returning to their normal flow.

activity time:
45 minutes



directions

1. Remove the glacier goo from the bag and place it on the PVC pipe at the higher end.
2. Observe the movement of your glacier. (Use discussion questions below to help students design their experiment.)
3. Now design your own experiment. (Ideas- velocity, where is goo flowing faster, can it move around objects, does the amount of goo in the chute change the results, what happens when rocks are added, etc.)
4. Write a hypothesis before beginning your experiment.
5. Write down your observations or data.
6. Share your conclusion with the class.



discussion before designing own experiment

- When the goo initially flowed, what shape did the front take?
- What part of the goo flows the fastest? Why?
- How can you make this glacier flow faster?
- In Antarctica, what would dam up a glacier flow?
- How could you design your experiment to show this?
- How can you change the elevation in this experiment?
- What would happen to the flow of a glacier when it hits obstructions in the valley?



after designing experiment

- What did you test?
- How did you design your experiment to show this?
- What did you use for a dam and how effective was it?
- What happens to the flow of a glacier when it hits obstructions in the valley?
- Did the surface of the glacier change?
- What did you learn about glacier flow?



extension and related activities

Glacier goo can be made by students and combined with a discussion of properties of matter. Changes in states of matter and viscosity are demonstrated easily with goo.

For a related activity, freeze a paper cup filled with water, sand and pebbles. Tear off the paper cup and place on a slanted board. Observe the remains of the glacier.

alignment to national science standards

Unifying Concepts and Processes, Standards B, D, E, F, G

alignment to kansas science standards

Science as Inquiry: **K-2** 1.1.1, 1.1.3, 1.1.4, 1.1.5 **3-4** 1.1.1, 1.1.3, 1.1.4 **5-7** 1.1.1, 1.1.3, 1.1.4, 1.2.2

Physical Science: **K-2** 2.1.1, 2.1.3 **3-4** 2.1.1, 2.1.2, 2.1.4, 2.2.1 **5-7** 2.1.1, 2.3.1, 2.4.1

Earth Science: **5-7** 4.1.1, 4.1.2

History and Nature of Science: **K-2** 7.1.1 **3-4** 7.1.1

Glacier GOO Recipe

crisis.ku.edu

What you'll need!

- 1/2 cup warm water
- 2 tsp. Borax powder
- 1 qt plastic zip lock bag
- Food coloring (optional)
- One 20 oz. cup
- 3/4 cup warm water
- 1 cup white glue
- One 8 oz cup
- 2 stirring sticks

mix 1

In a large cup, add 3/4 cup warm water and 1 cup glue (for color add 6 or more drops of food color). Stir until well mixed.

mix 2

In the smaller cup, measure 1/2 cup warm water. Add 2 tsp. of Borax powder. Stir until the Borax is dissolved.

Pour Mix 2 (the powder mix) into the glue mix. Stir until a glob forms and most of the water is mixed in. This happens quickly!

Knead and work the mix for 2 - 3 minutes. Most, if not all, of the water will be incorporated.

Place the glacier goo in the zip lock bag (the mixture will store for a few months).