

# Slip Sliding with Glacier Goo

## materials

Per team:

- One recipe of goo (below)
- One goo chute (PVC pipe or cookie sheet)
- Books to prop up chute
- Dry erase marker
- Medicine dropper with marked measurements
- Pencil
- Ruler
- Straw
- Water

## background

Under the pressure of its own weight and forces of gravity, a glacier moves outwards and downhill. Valley glaciers flow down valleys and very large glaciers (ice sheets) flow outward in all directions from a central point. Glaciers can also move when the glacier slips on a thin layer of water at the bottom of the glacier. This water may come from glacial melting at the base (due to the pressure of the weight of the ice) or from water that has worked its way through the cracks when ice melted at the surface. The layer of water reduces friction and causes the glacier to move faster downhill.

activity time:  
**45 minutes**

## directions

1. Show pictures of glaciers at <http://picasaweb.google.com/cameron.lewis.ks/HelheimFlightDay1#5324944840857161746> to explain where they are found and how they move.
2. Give students time to explore the goo if they have not used it. What happens if you pull on it slowly? Quickly?
3. Ask students to place the entire amount of goo at the top of the goo chute and mark the chute at the goo's highest point.
4. Set the timer for 5 minutes.
5. Mark where the goo stopped.
6. Measure the distance the goo traveled from start to finish.
7. Determine the rate of flow by:  
$$\frac{\text{Distance goo traveled (in centimeters)}}{\text{Time(in seconds)}}$$
8. Set up the experiment again, marking the beginning of the goo.
9. Set timer for 5 minutes
10. Poke a straw through the goo as close to the top of the goo as possible.
11. Add 5ml (1 t) of water through the straw.
12. Measure the distance the goo traveled from start to finish.
13. Determine the rate of flow now that you added water.

## discussion

- Which goo traveled fastest? Slowest?
- Why? (faster due to less friction)
- What does this tell you about glaciers? (They move faster with water at their base)
- Why is it important for scientists to find out how fast glaciers move?

## extention

Have students design their own glacier investigations using goo and water.

## related activities

"Glacier Goo", same standards as Goo (online)

## alignment to national science standards

Unifying Concepts and Processes, Standards A, B, 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, 1.3.1

**Physical Science:** K-2: 2.1.2, 2.1.3; 3-4: 2.1.2, 2.1.3, 2.1.4, 2.2.1; 5-7: 2.1.1, 2.3.1, 2.4.1, 2.4.3

**Earth Science:** 3-4: 4.1.1; 5-7: 4.1.1, 4.1.2, 4.2.1

**Science and Tech:** 3-4: 5.2.3

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

# GLACIER GOO



## ingredients

1/2 cup warm water  
2 tsp. Borax powder  
1 qt. plastic zip lock bag  
food coloring (optional)  
20-ounce cup

3/4 cup warm water  
1 cup white glue  
8-ounce cup  
2 stirring sticks

## mix one

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

## mix two

1. In the small cup, measure 1/2 cup warm water. Add 2 tsp. of Borax powder. Stir until the Borax is dissolved.
2. Combine mix 2 with mix 1. Stir until a glob forms and most of the water is mixed in. This happens quickly!
3. Knead and work the mix for 2-3 minutes. Most, if not all, of the water will be incorporated.
4. Place the glacier goo in the zip lock bag. (The mixture will store for a few months.)