

Glaciers: Icy Bulldozers

4th Grade

Sarah Fortner, Lucille Duncan

References:

<http://tvll.geo.uc.edu/ice/modules/dynamic/make.html>

Benchmarks:

SLC# 15: Students will better understand weathering and erosion and how it affects the surface of the earth. (Benchmark B): Summarize the processes that shape the Earth's surface and describe evidence of those processes. ES-9: Identify and describe how freezing, thawing, and plant growth reshape the land surface by causing the weathering of rocks.

Objectives:

Glaciers are agents of erosion. Students will learn this by making their own glacier and performing experiments with the glacier. (They will design the experiments) Students will discuss how the landscape is shaped by glaciers and what happens to the landscape after a glacier disappears.

Materials

4 parts (teaspoons) Elmer's Glue All
4 parts (teaspoons) water
1 part (teaspoon) saturated borax solution

Ramp or model mountain for glacier (something with a slope)
(Cake pan might work)
Food coloring to look at glacier flow
Sand/dirt for glacier to rest on and push

Initial Observation/Demonstration:

Students will review the agents of erosion and discuss physical weathering as observed in previous experiments with wind and water. Students will be asked how glaciers form? How long does it take for glaciers to build and move? Where are they found? Students will hypothesize what a glacier might do to the landscape? Students should discuss that glaciers are common in mountains where snow sticks around. We will let them know that the ice becomes more plastic as the glacier grows.

Procedure:

Students will be asked to create their own glaciers with glue and borax. We will ask them what they would like to set up in order to explore glacier erosion. (We will have dirt and a ramp available. We will also encourage them to investigate temperature and other effects on flow (the borax/glue mixture will solidify and move slower if refrigerated). We can add a line of food coloring across the glacier and examine how the glacier flows faster in the middle.

Discussion/Summary:

Students will be asked to draw their glacier and label where the sediment has moved, and discuss how that model reflects what happens on when glacier ice scrapes rock? We will have the students look up a picture of glacier striations and moraines on the internet.

Procedure:

Students will have time to revise their diagrams after looking at internet pictures of glacial erosion. We will discuss how long glaciers take to build (a mile of ice in Antarctica would require many many snowfalls).

Extensions: Students could further discuss what happens to the glacier when it melts, where does the water go?