

GLACIOLOGY WITH DR ELLYN ENDERLIN

TALKING POINTS

- 1) What's the difference between a glacier and an iceberg? (See *What is a glacier?*)
- 2) What are the two methods of measuring ice flow? (See *How does Ellyn measure glacier change?*)
- 3) Are glaciers made of fresh or salty water? Why? (See *What is a glacier?* and *How does glacier melt water affect ocean currents?*)
- 4) Can you describe the "ocean conveyor belt"? You might want to draw a diagram. (See *How does glacier melt water affect ocean currents?*)
- 5) How does Ellyn see that her research could motivate people to reduce greenhouse gas emissions? (See *How will this information help to protect the environment for future generations?*)
- 6) What is geoscience? What part of geoscience do you find the most interesting? (See *About Geoscience and Glaciology*)
- 7) Ellyn was inspired by a field trip in Peru. Have a look at the internships weblink. Do any of them inspire you? (See *Opportunities in geoscience*)

ACTIVITIES YOU CAN DO AT SCHOOL, COLLEGE OR AT HOME

SIMULATE ICE FLOW WITH "GLACIER GOO"

You will need:

- 475 ml PVA glue
- 700 ml warm water
- 2 tablespoons of borax
- Liquid food colouring (optional)

Combine the glue with 500 ml of warm water (and food colouring if desired) and mix thoroughly. In a separate bowl, combine the borax with 200 ml of warm water and mix until dissolved. While continuously stirring the glue-water mixture, gradually pour in the borax-water mixture. As the mixture thickens, start kneading it with your hands until all the water is absorbed. You can store this mixture known as flubber in an air-tight plastic bag for a day or so but it will eventually dry out.

Using an inclined PVC pipe that has been cut in half along its length, you can demonstrate ice flow down a U-shaped glacier valley. To simulate the effects of friction on ice flow, you can stick toothpicks in a straight line across the glacier.

For more details of flubber-related activities, take a look at Ellyn's webpage: <https://sites.google.com/site/ellynenderlin/home>

Also, check out Leigh Stearn's flubber lesson plan:

<http://www.people.ku.edu/~stearns/leigh/page2/page15/flubber.html>

GLACIER SIMULATION TOOL

Check out this cool glacier simulation tool from the University of Colorado Boulder. You can visualize the effects of climate change on glacier size. You can change the temperature and snowfall and watch the glacier grow and shrink over time. You can also watch ice flow using flags on the surface and holes drilled in the ice (called boreholes) to see how friction influences flow at the base of glaciers.

<https://phet.colorado.edu/en/simulation/glaciers>

PENGUIN GAME

Try your skills in this game about ice flow in the Antarctic. Grow and shrink your floating ice shelf to expose the water (and fish).

<http://www.iceflowgame.com/>