



Can You Melt a Glacier with Pressure?

materials

- A loaf pan of ice, 2 inches or more thick
- 2 bricks or weights
- Thin wire
- 2 boxes the same height, at least 20 inches above the floor
- 1 Wooden or metal scrap to hold up ice block between boxes
- 1 Dishpan or cookie sheet to catch drips

background

This demonstration shows students one reason a glacier moves. A glacier is a large mass of ice that acts like a river, flowing downhill under the influence of gravity. As snow layers accumulate and gather weight, the pressure builds up on the bottom layer. This causes the bottom layer of ice to melt and it becomes soft and pliable. The melting of the ice due to pressure and its refreezing is called regelation. The softer ice moves outward like thick honey. As long as snow continues to fall, the height of the glacier remains constant and fingers of ice move out from the bottom of the mountain of ice. The snow layers continue to compress and add weight and pressure to the layers below which cause continuing regelation, and therefore movement.



directions

1. Place the boxes about 1 foot apart and put the metal or wood board on top of them like a bridge.
2. Set the block of ice on the metal or wood board.
3. Place a thin wire over the ice.
4. Tie a heavy weight to each end of the wire (the weights will be dangling on either side).
5. Place a drip pan under the ice.
6. Observe what happens to the wire and what happens to the ice. (This happens pretty quickly)
7. Ask students to touch the ice block where the wire has gone through.

activity time:
30 minutes



discussion

- What happened to the wire? (The wire sank slowly through the ice.)
- What happened to the ice? (The ice under the weighted wire melted.)
- Why did the ice not break in 2 pieces? (The ice refreezes above the wire.)
- How does ice melt normally? (By a raise in temperature)
- How did ice melt in this case? (By pressure)



extension

Ask students to do “Glacial Movement” at home and report the results in class.



related activities

“Glacial Movement”
“Blue Ice Cube Melt”

alignment to national science standards

Unifying Concepts and Processes, Standards B, E, F

alignment to kansas science standards

Science as Inquiry: K-2: 1.1.1, 1.1.3, 1.1.4, 1.1.5; 5-7: 1.1.1, 1.1.4, 1.2.2, 1.3.1

Physical Science: K-2: 2.1.3; 3-4: 2.1.1, 2.1.2, 2.1.4, 2.2.1, 2.2.2; 5-7: 2.1.1, 2.3.1, 2.4.1, 2.4.3

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