



CONCEPT: Ice Shelves Apply 'Force'

IcePod is a packet of instruments collecting highly detailed and accurate images of the polar ice sheets. **'Bergy Bits'** are simple activities introducing science concepts through student experimentation, tying these concepts to real glacier physics. Named for small pieces of ice found in both the Arctic and Antarctica, 'bergy bits' are small pieces of floating ice that break from an iceberg, ice shelf or glacier.

What is Force? Force is the push or pull on one object as a result of its interaction with another object. Every interaction between two objects results in a *force* on each object.

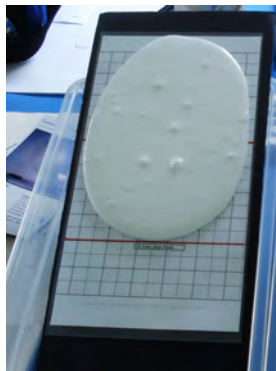
What is an Ice Shelf? An *ice shelf* is a floating platform of ice that is connected to a land mass. It forms when a glacier or ice sheet flows from land into the cold ocean. Ice sheets are critically important because they create back pressure on the glaciers, slowing the flow of land ice into the ocean where it contributes to sea level rise.

Gather Activity Supplies using supplies sheet for Bergy Bits activities

Ice Shelf and Ice Flow Activity:

- Place the matted grid board in the plastic box to create a ramp
- Place the glacier goo at the 'start line' of the grid with the ruler just below acting as an ice shelf applying *force*. Hold in place for 2 minutes, remove ruler & observe.
- In nature, if an ice shelf shrinks or collapses through melting, the *force* against it is reduced or lost and the glacier flow speeds up.

Note: Do not let students see picture (2) or (3) until the end of the activity



1) Position the glacier goo and place ruler beneath it on the ramp and hold for 2 minutes.

2) Observe the glacier goo once the ruler representing the ice shelf is removed.

3) Real world photo of the Pine Island Ice Shelf in West Antarctica. The Pine Island Glacier is being slowed by the *force* of the ice shelf in front of it.

Describe your observations:

- 1) What happened when the ruler was held below the glacier goo?
- 2) What happened when the ruler was removed?
- 3) When we think of *force* as a *push* it sounds like a shove, but it can be just steady pressure of one object against another. Where is the *force* in this activity?
- 4) Image (3) is a large ice shelf in West Antarctica. Behind the floating ice shelf you can just see the glacier. What if providing the 'force' in this situation? Make a prediction. What will be the effect on the glacier if this ice shelf shrinks or collapses?