MELTING PACK ICE AND OCEAN LEVELS RISE

(Level: primary school to high school)

SUBJECT: CONSEQUENCES OF CLIMATE CHANGE
EXPERIMENTS TO DO IN CLASS

1. THE QUESTION

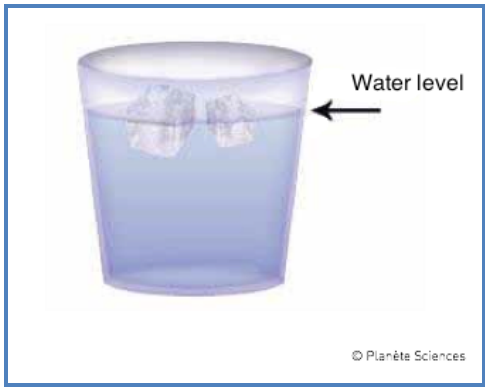
Laurianne: "If the North Pole melts, won't ocean levels rise?"

2. MATERIALS

- 2 ice cubes
- 1 glass of water
- Water
- Non-permanent marker pen

3. EXPERIMENT

1. Put the ice cubes in the glass and fill with water almost up to the rim of the glass.
2. Mark the level of the water on the outside of the glass before the ice cubes start to melt. (This way you'll know the water's level at the start of the experiment.)
3. Let the ice cubes melt. Did the water overflow the glass? Did the water level rise above the initial level marked on the glass? Why? Was Laurianne correct?



4. GOING FURTHER

Warming at the North Pole is causing the Arctic pack ice to melt. The danger is that in several years, pack ice formation will cease because of increasingly warmer temperatures. But even if all of the North Pole pack ice melts, this will not cause a rise in ocean levels!
In reality, every body (regardless of its state) immersed in a liquid, displaces a volume equivalent to its proper volume – this is Archimedes' principle. Regardless if the pack ice floats (in solid form) or is liquid, it will *almost* always occupy the same volume – "almost" because in reality, the solid ice takes up a slightly larger volume than liquid water. (But on a planetary scale, the difference is miniscule). In other terms: the water making up the pack ice originates from the freezing of polar seas, and is already part of it, so will not add to it when melting. However, the melting of the polar pack ice can have other dire consequences, like perturbing ocean currents.

Note: The same experiment can be done with an aquarium and ice cubes.

This experiment was designed by the association Planète Sciences.

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