



What's Happening at the Poles?

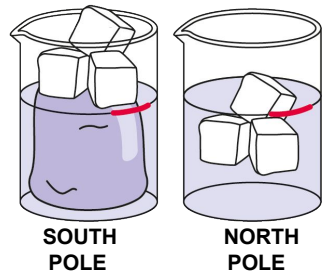
Sea levels have varied significantly throughout the Earth's history: 120,000 years ago (during the time between the last two ice ages), the average sea level across the globe was over 5m above where it is now! For the past several thousand years, average sea levels have been stable worldwide, but since 1901, they have risen by 19cm.

This recent acceleration is due to **climate change**. As we continue to release greenhouse gases into the atmosphere by burning fossil fuels and modifying our environment, we are slowly making our planet warmer. But how does this warming affect **sea level rise**?

This is exactly what your students will be investigating today! This experiment requires no preparation on your part, except for gathering the necessary materials. Students can be split into groups or pairs, or they can work individually if you have enough materials.

Things you'll need per group

- Play dough
- Two clear plastic or glass containers
- Ice cubes
- Tap water
- Marker or coloured tape



Alternatively, if you find that you might be missing materials, you could demonstrate the experiment on a larger scale to the whole class.

It's important to note that the ice will take some time to melt depending on the temperature of your classroom. In the meantime, we recommend having the students answer step 6 and read all of the background information provided once they've done so. You can also **speed up** the melting process by using a hair/blow dryer.

After they read this, the ice should have melted enough for a difference in the water levels to be visible. They **should** see that the 'South Pole' water level has risen and that the 'North Pole' water level has stayed the same (see the next page and the background information to learn exactly why). You can then start a discussion about why sea ice does **not** raise sea levels with the students. We recommend using the information provided in the answer sheet on the next page of the teachers guide.



What's Happening at the Poles?

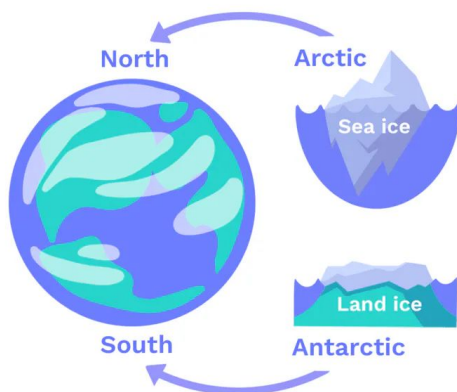
Activity sheet answers

**What do you think is going to happen to the water level in both containers?
Will it rise or stay the same? Why?**

The water level in the '**North Pole**' container should stay the same, because water in solid (ice) form takes up more volume than water in liquid form. This means that the melted water should take up a bit less space than when it was frozen. This would mean that the water level should technically decrease. However, since ice cubes float, not all their volume is submerged (under water). The melted water is therefore about equivalent to the volume of ice that was under the water before so the water level just stays the same.

The water level in the '**South Pole**' container should rise because the ice is not taking up any of the space within the water. Since it is all found above the water level, any ice that melts into water will add to the water in the container and, therefore, increase the level.

Lastly, you can calculate how much sea levels have risen since 2006 using the following formula: **[(current year - 2006) X (1.8mm 1.4mm)] = sea level rise since 2006**



We welcome feedback and would be delighted to hear your thoughts on this activity. Feel free to send an email to schools@climatescience.org and we'll be sure to get back to you soon :)