

Suitable for primary aged children

Ice Investigation: How Does Melting Ice Affect Sea Levels?

As the Earth's climate gets warmer, polar ice is melting, which can cause **sea levels** to rise. But does it matter whether the melting ice is on land or floating in the ocean? In the Arctic (North Pole), ice floats on the sea, while in Antarctica (South Pole), the ice sits on land. This experiment will help us understand which type of ice contributes more to rising sea levels.

Definitions:

- **Sea Level:** The average level of the ocean's surface, used to measure how high the water is globally.
- **Sea Ice:** Ice that floats on the surface of the ocean.
- **Land Ice:** Ice that forms on land, like glaciers or ice sheets.
- **Climate Change:** Long-term changes in Earth's temperature and weather patterns, often caused by human activities.

What you will need:

- 2 clear plastic containers
- Cold water
- 2 similar objects, that are heavy enough to sink, to represent the land (this can be something like clay/playdough, a tin, some pebbles)
- Ice cubes
- Measuring tape or ruler
- Paper and pencil

Do:

1. **Set Up:**
Place the items you've chosen as your land into each plastic container.
2. **Add Ice:**
In one container, place ice cubes on top of the land (this is your **land ice**).
In the other container, place the same amount of ice next to the land at the bottom of the container (this is your **sea ice**).
3. **Fill with Water:**

Pour cold water into the sea ice container until the ice floats. Make sure no ice is resting on the bottom and the water doesn't cover the land. In the land ice container, pour water until the water level matches the other container.

4. Measure Water Level:

Use a ruler to measure the water level in both containers. Record this measurement on your paper.

5. Wait for the Ice to Melt:

Let the ice melt completely. You can speed up the melting process by placing the containers in a sunny spot or using lukewarm water. Once the ice has melted, measure the water levels in both containers again. Record the new measurements.

Discuss What Happened

When the ice on the land melts, you'll notice that the water level in the container rises. Whereas the water level in the container with sea ice will stay the same after the ice melts.

This happens as when ice on land melts, it adds extra water to the ocean, causing sea levels to rise. This is because the ice wasn't part of the ocean to begin with. Sea ice is already part of the ocean. When it melts, it turns into water, but it doesn't change the total volume of water in the ocean. This is similar to how ice in a glass of water melts but doesn't cause the glass to overflow.

- Why do you think land ice has a bigger effect on sea levels than sea ice?
- How might rising sea levels affect coastal cities and habitats around the world?
- What can we do to slow down the melting of land ice?

Follow Ups

Check out images and videos on NASA's website showing aerial timelapses of the decrease in ice in the Arctic, Antarctica, Greenland, and Iceland.

<https://climate.nasa.gov/interactives/global-ice-viewer/?intent=021#/>