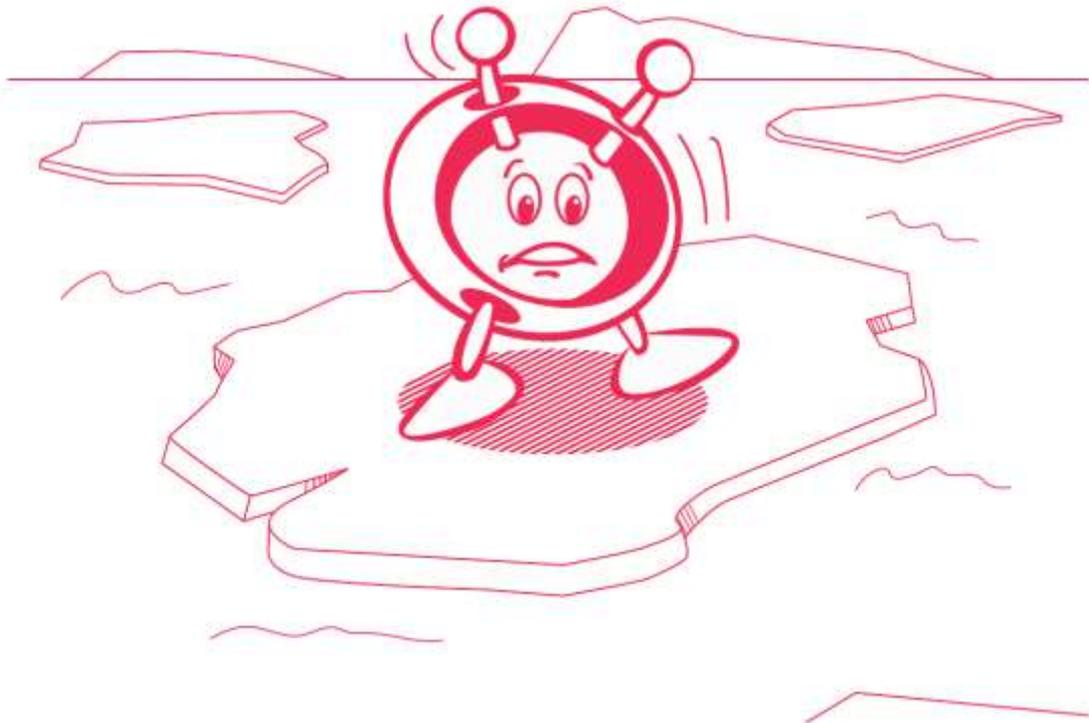


Science

Activity

→ THE ICE IS MELTING

How can we investigate the effects of melting ice?



In This Activity You Will Think About Ice And The Difference Between Land Ice And Sea Ice.

Did You Know?

10% of the Earth's surface is covered in ice, but it hasn't always been this way. During the Earth's history there have been several 'ice ages' which happen when the Earth's temperature drops and ice covers much more of its surface. The temperature of the Earth naturally changes over time. Currently it is increasing, but this time the change is not entirely natural, it is due to human activity. The picture on the right shows the ice at the North Pole.



Picture below shows the difference at the North Pole between 1979 and 2000. The yellow line shows how much ice we used to have at the North Pole.



Activity: Will Sea Levels Rise with Melting Ice?

Do you know what happens when land ice melts? What about when sea ice melts? Is there a difference? In this activity, you will work to carry out a practical experiment to investigate these questions. Land ice is ice that is on solid ground, sea ice is ice that floats on water.

Prediction

1. Describe what you think will happen to sea levels when the ice melts and explain whether you think that melting of sea ice will have a different effect on sea levels to the melting of land ice.
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Equipment

- 2 small plastic cups
- 2 small plastic plates
- 2 ice cubes
- Enough water to fill the two cups
- Modelling clay

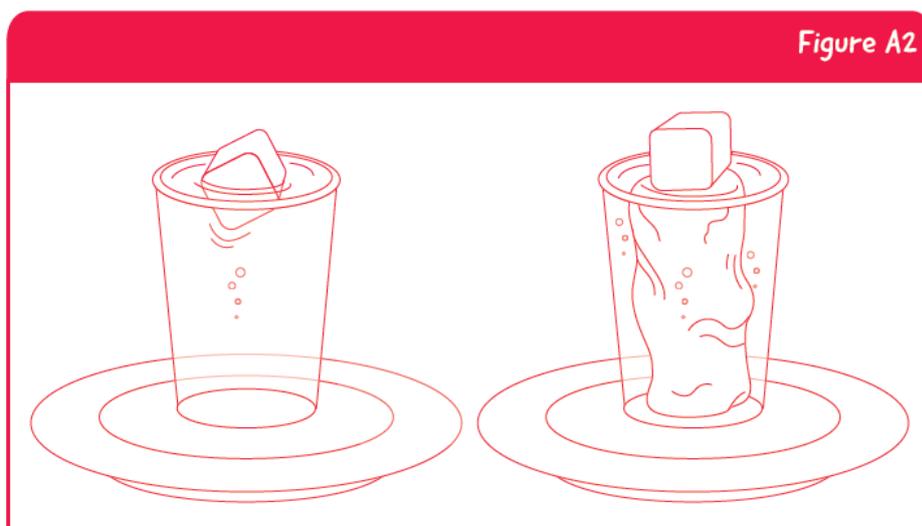
Exercise

Cup 1 (Figure A2)

- a. Put a cup onto a plate
- b. Wet your hands! Put one ice cube into the cup.
- c. Fill the cup to the very top with water, do not over fill it!

Cup 2 (Figure A2)

- a. Put the second cup onto a plate
- b. Put a cylinder of modelling clay into the cup, making sure that the tip of the clay is just above the rim of the cup. Make a small dent at the top of the clay for the ice cube to sit in.
- c. Place an ice cube on top of the modelling clay.
- d. Fill the cup to the very top with water.



↑ The set-up of the experiment

Wait a few minutes for the ice to start melting. Whilst you wait, answer the following questions.

2. Circle the kind of ice that you think is represented in cup 1.

land ice sea ice

3. Circle the kind of ice that you think is represented in cup 2.

land ice sea ice

4. Explain what you expect to happen in cup 1, e.g. with the ice cube and the water level.

5. Explain what you expect to happen in cup 2, e.g. with the ice cube and the water level.

Observation

After ten minutes, examine your cups.

Is cup 1 overflowing? yes / no

Is cup 2 overflowing? yes / no

6. Based on your previous answers, do you think that sea levels will rise if the sea ice melts? Explain your answer.

7. Will sea levels rise if the land ice melts? Explain your answer.

Did You Know?

If the ice in Greenland ice melted, the sea levels would rise by an average of 7 metres worldwide. In some places this value would be higher, and in some places lower. Many cities and towns on the coast would be submerged.

In the very unlikely case that all of Earth's land ice melted, the sea levels would rise by an average of 70 metres worldwide...goodbye Portstewart...no more holidays!



Results

The water in cup 1 should stay at the same level, whereas the water in cup 2 should overflow.

Discussion

- Melting sea ice does not cause sea levels to rise, whereas melting land ice does.
- In ice form, the sea ice is already contributing its volume to the oceans. Thus when it melts it does not increase the volume of the oceans.
- In ice form, land ice is not contributing to the volume of the oceans. When it melts, it flows into the ocean, increasing the overall volume.
- It is misleading to say that melting ice overall leads to rising sea levels. It is melting land ice that mostly leads to rising sea levels.
- Note that indirectly, melting sea ice can lead to rising sea levels, through changing properties such as the salinity, density, and current. But these effects are less extreme, and less measurable than the changing volume as a result of melting land ice.
- Ice is special because it is one of the few materials where its solid form is less dense than its liquid form, so it floats. This means that in ice form, the sea ice takes up more space than it does in water form(Remember that water expands when it freezes!).

Hope you enjoyed your Science Activity!

Mr Watson