Ice melting experiment

BDR Barnsley Doncaster Rotherham Waste Partnership

Aims of the experiment

To investigate how ice melts and the effects of sea level rise.

Success criteria

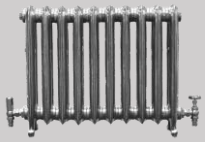
- I can identify the causes of melting ice
- I can describe the effects of sea level rise on our planet

Task 1-Melt the Ice!

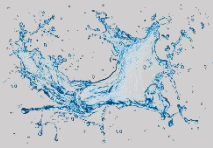
Did you know that about 10% of our planet is covered in ice? This is mainly at the polar regions and high up in the mountains. As we know ice melts when it warms up, so today you are going to investigate how we can do that.

Your first task is to design and carry out an experiment that will investigate which of the six ways below will melt the ice the quickest and which will melt it slowest.

Heat from hands



Heat from room



Water

Salt

Sugar

The fridge

Method

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Design your experiment here:

Predictions

I predict that _____ will melt the ice the quickest.

I predict that _____ will melt the ice the slowest.

Write your observations here:

Which melted the fastest? _____

Which melted the slowest? _____

Sea level rise

Due to climate change, our planet is getting hotter at a faster rate than normal and this is causing the ice on our planet to melt.

Your next task is to investigate the possible consequences of this.

What you will need

- A metal pet food dish or other metal dish/pan
- Cold water
- Ice cubes
- Marker pen
- A colander or sieve
- Something to heat the water – e.g. hot water bottle, a heat pack, radiator
- A stop watch, clock or timer

Task 2- Does melting sea ice cause sea level rise?

1. Take the metal dish/pan and half fill it with water.
2. Put ice cubes in the water- make sure they are below the surface of the water.
3. Using the magic marker pen, draw a line on the side of the pet dish to show the level of the water. This line represents the sea level.
4. Allow the ice cubes to melt completely, without heating the water.
5. Check the sea level- has it gone up?

Write your observations here:

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Task 3- Does melting ice on the land cause sea level rise?

1. Fill the same metal dish/pan half full of water.
2. Using the magic marker pen, mark the level of the 'sea'.
3. Put ice cubes in a sieve or colander and position it above the water.
4. Allow them to fully melt without heating the water! Time it using your stop watch. Check the 'sea level'. Has it gone up?

NB: If you can't find a sieve or colander, allow the ice cubes to melt through your fingers. It will have the same effect!

Write your observations here (including the time it takes to fully melt):

Task 4 - Does climate change cause our sea level to rise faster?

1. Follow the steps of task 3
2. This time, place your bowl near a heat source, such as a radiator, heater, in the sunlight or next to a hot water bottle (be careful not to touch the heat directly!)
3. Allow the ice to fully melt. Time it using your stop watch. Does it take longer than the ice in task 3?

Write your observations here (including the time it takes to fully melt):

What do the results mean?

Climate change causes the level of the sea to increase because of the following reasons

- The hotter air melts the ice on land such as ice sheets and glaciers. The hotter the air, the more ice will melt. The melted ice turns into water which flows into the sea, adding more water to ocean.
- Water expands as it heats up. This is why, when we are cooking food such as pasta or potatoes in a pan, we do not fill the water to the top as it will overflow when it heats up. Similarly, warm water in the ocean takes up more space in the ocean basin, causing the sea level to rise.

The ice that is already in the sea does not cause it to rise. This is because the volume stays the same as ice is just frozen water

Experiment outcomes

Task	What should happen
Task 2:	The water level (sea level) did not go up
Task 3:	The water level (sea level) went up.
Task 4:	The water level (sea level) went up at a faster rate.

Why does it matter?

A small increase in sea level could affect millions of people across the planet who live along coastlines and in low-lying areas.

Floods could happen forcing people to move from their homes and some areas could become completely covered by water. Higher sea levels also mean that storm surges – the rise in seawater level during a storm – will be bigger and happen more often, reaching further inland and causing more frequent flooding.

As salty sea water goes inland it can cause damage to freshwater habitats which will effect many plants, fish and birds.