

Rising Tides

Time: 30 minutes to set up the experiment, then hourly recording of the water level rises.

Introduction The Antarctic and the Arctic are different. The Antarctic is a frozen continent with a land mass under the ice. The Arctic is a frozen sea with water under the ice. The word Arctic comes from the 'arktos', meaning 'bear' because polar bears live there. The word Antarctic means 'the opposite of the land of the bear' because no polar bears live there ... although lots of penguins do!

The Antarctic Ocean is full of beautiful, silent shapes in the form of icebergs. 80% or more of icebergs are hidden below the water's surface. Where does all this ice come from?

Learning Objective:

To understand that when the Arctic, a frozen sea, melts, it won't affect the sea level rises around the world, but as the Antarctic continent melts, it will have a major impact on sea level rises.

Resources

1. Permanent marker pen, tape and 2 stickers
2. 2 upturned, empty tins of tuna or similar with a big, flat surface area and some cling-film
3. 2 identical medium-sized bowls or containers
4. Lots of crushed ice
5. Measuring jugs of water
6. Rulers.

1 In the morning, tell the children that you are going to perform an experiment about rising sea levels by using upturned, empty tins of tuna with ice on the top (to represent Antarctica) and ice around the tin (to represent the ice of the Arctic floating in the sea).

2 Seal the inside of the tins by placing cling-film across where the lid would be and taping the cling-film round the middle of the tin. Next stick 2 white stickers on the side of the tins and mark the tins halfway up at the same point. Place both tins in the middle of the bowls, making sure the bowls are on a level surface.

3 In the first container put crushed ice onto the tuna tin, making sure not to let it fall off the tin. In the second container, sprinkle the same amount of crushed ice in the bowl around the tin. Weigh the crushed ice first to make sure the amounts are the same.

4 Pour water into each container up to the mark on the tin. Tell the children that the tin of tuna with ice on top of it represents the Antarctic and the other tin with the crushed ice in the water around it represents the Arctic. Measure the distance from the bottom of the bowl to the mark and record this measurement.

5 Ask the class what they think will happen. Then ask them to draw the following table so that they can record the hourly changes they measure throughout the melting process.

Time/ Tin	Ice topped tuna tin measurements	Ice surrounded tuna tin measurements
Starting Measurement		
+1 hour		
+2 hours		
+3 hours		
+4 hours		
+5 hours		

6 Leave the containers in a cool place. Measure the water level rises from the bottom of the bowl to the mark on the tuna tin every hour. What do the children notice happening? Do the water levels increase differently? Why do the children think this is?
Ice floating in water already takes up space in the water before it starts to melt. The ice on the can adds to the quantity of water as it melts into the container. The Antarctic holds huge quantities of ice that aren't in the sea. If this ice melts because of climate change and temperature rises, then sea levels will rise, too.

Differentiation

Some children may be able to create their own table. More able children may be able to estimate the level rises.

Success Criteria

Children understand that when ice already in water melts, the water level does not rise, but when ice melts into water as an additional amount, the water level increases.