





## Steps to Success

Lockdown	
Date	Wednesday 3 <sup>rd</sup> February
Subject/s	<b>Science</b>
Learning Objective 	To explain a rise in sea level

		SA 	TA 
Success Criteria 	I know the difference between an ice cap, an ice sheet and an ice field		
	I understand why glaciers are melting		
	I can set up an activity to demonstrate the rise in sea levels		
Support	Independent                      Adult Support (    )                      Group Work		
<b>Key vocabulary for the lesson:</b> Ice cap    ice sheet    ice field    glacier    rise    sea level			

# MELTING POLAR ICE CAPS

The Earth is known as the **Goldilocks Planet**, as rather like the littlest bears porridge it is neither too hot nor too cold. It is this favourable temperature which allows life to exist.

Earth is the only planet we know of where water can be in the form of a gas, liquid or solid ( remember water is essential for life ). When scientists look for life on other planets, they usually look for water as an indicator of life.

At the North and South pole of our planet are vast sheets of ice which have more of an impact on global climate than you might think. As the ice melts, water absorbs warmth from the sun which white ice would've reflected back into space, this contributes to the increasing temperature of our planet. Fresh water from melting ice sheets also changes ocean currents, affects conditions for wildlife and will potentially contribute to extreme weather conditions in the future.

Did you know sea levels are thought to have risen 15-20cm in the last 100 years due to melting ice?

## **WHAT IS AN ICE CAP?**

An ice cap is a thick layer of snow and ice covering less than 50,000 square kilometers. Ice caps form as snow falls, melts and falls again. Snow that melts slightly becomes harder and compressed. New snow falls on top and the snow underneath becomes even denser. This happens over and over again with layers of compressed, hard snow forming on top of each other. Eventually a huge mass of solid ice forms known as a glacier.

Ice caps in polar regions are known as polar ice caps.

## **WHAT IS AN ICE SHEET?**

An ice sheet is glacial ice covering more than 50,000 square kilometers. The Antarctic ice sheet is the largest single mass of ice on Earth. If this melted it's thought that sea levels would rise by up to 60m!  
Ice sheets form when snow that falls in winter doesn't entirely melt in summer. Over time the snow accumulates and compresses to form ice sheets.

## **WHAT IS AN ICE FIELD?**

An ice field is an expanse of ice caps and glaciers.

## **WHY ARE GLACIERS MELTING?**

Glaciers have been melting since the beginning of the 19th century. Scientists think this is because of human activities, especially the burning of fossil fuels which has increased the amount of carbon dioxide in the atmosphere leading to global warming.

Projections show that over a third of the world's glaciers will melt before 2100 even if we reduce carbon emissions.



### Rise in sea levels investigation

Use the equipment below to set up your own activity to demonstrate how melting ice caps creates a rise in sea level.

#### **MELTING POLAR ICE CAPS**

Large Icebergs

A container

Water

Stones

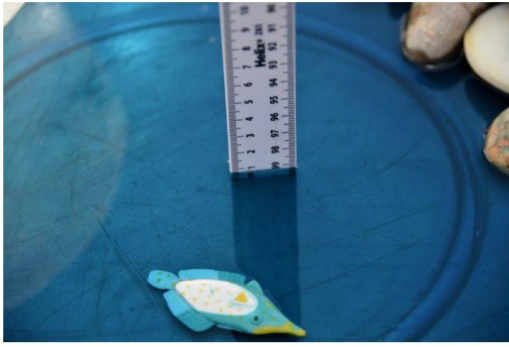
Polar Animals

Ruler

Timer



1. Freeze water to create your own ice caps. You can add animals if you wish.
2. Place the frozen ice in a large container.



3. Use a ruler to measure the height of the water after 20 minutes.

4. Record the results in the results table below.



5. Continue to measure the height of the water every 20 minutes until the ice has completely melted.

**Results table**

Time	Height the water (cm)
After 20 minutes	
40 minutes	
1 hour	
1 hour 20 minutes	
1 hour 40 minutes	
2 hours	