

### Steps to Success

Date	Monday 8 <sup>th</sup> February 2021
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		
Lockdown learning: DC			
<b>Key vocabulary for the lesson:</b> Ice cap    ice sheet    ice field    glacier    rise    sea level			

#### Sea Level Rise

- The main reasons for sea level rise to do with expansion of the water as it gets warmer.
- Currently there is a lot of ice sitting on top land in places like Greenland, Alaska, Scandinavia and in high mountain ranges.

If this ice continues to melt then sea levels will rise. Just the ice on Greenland could increase sea levels by around 6 metres.

#### Map showing (in red) a 6 metre sea level rise

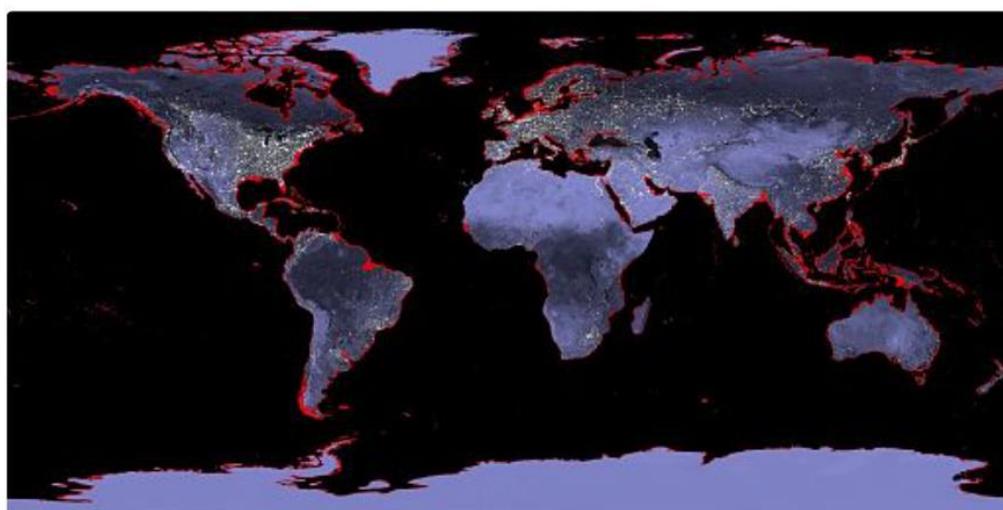


Image: 6m Sea Level Rise - NASA © Wikimedia Commons - Public Domain



# Climate Change

from the BBC Weather Centre

Impacts

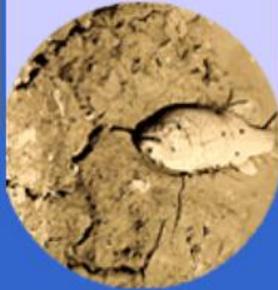
Evidence

Impacts

Adaptation

Policies

Links & chat



Water  
Agriculture  
Human health  
Wildlife  
Coral  
Opportunities

## Sea Level Rises

As temperatures rise, the sea will absorb heat from the atmosphere, causing it to expand and therefore creating sea level rises.

Recent studies show that the **ice sheets** in Greenland and Antarctica are melting faster than the snow is replacing the mass. Land glaciers will continue to melt over the coming century which will increase the level of the seas. In their 4th Report the **IPCC** predict a sea level rise of 0.18 – 0.38m increase by 2100 in the most optimistic scenario and 0.26 – 0.59m in the most pessimistic.

Some islands will be affected by sea level rises significantly and their habitats will be threatened. One example is of the small island - Tuvalu in the Pacific, which is already experiencing severe flooding which is damaging their homes and affecting drinking water. The islanders have already started to leave and the rest will have to do so in coming years if the trend continues.



In the UK, the effect of sea level rises goes hand in hand with the land movements being experienced across the country. Therefore sea level rises could be different throughout the country. Sea level rises increase the risk of **flooding** and coastal erosion, particularly in the south and east of England.

### Water:

[Glaciers and ice sheets](#)

[Flooding](#)

[Gulf stream](#)

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All About

# Global Warming

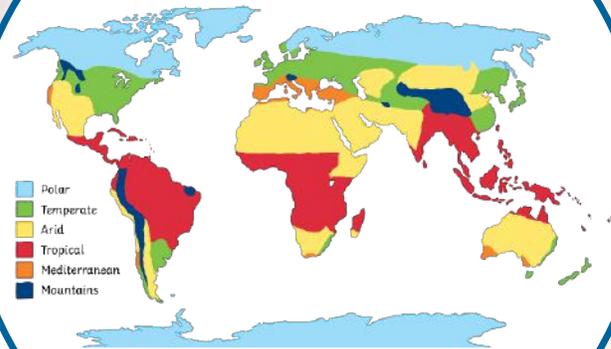


# What Is 'Global Climate'?

Climate is a trend of temperature and weather in a place or area over a long period of time.

There are different climate zones in the world. Some are hotter, some are cooler. The global climate takes all of the different areas in world into consideration and looks at average trends.

The UK is classed as being in the temperate zone and has four seasons. However, some places in the world only have two seasons.



Did you know?

# What Is Global Warming?

Global warming is part of climate change and is concerned with the rising temperatures of the global climate.

It refers to the fact that the Earth's temperature is getting hotter, having increased by about  $1^{\circ}\text{C}$  over the last 100 years. That doesn't seem like a lot –  $1^{\circ}\text{C}$  over the last 100 years – but this is a faster rate of warming than ever before.

Unfortunately, this doesn't mean that we will have lovely summer weather more of the time, it will actually have some worrying effects.

The global temperature rose from between  $4^{\circ}\text{C}$  to  $7^{\circ}\text{C}$  over the 5000 years when we came out of the last ice ages.



Did you know?

# Haven't Temperatures Always Changed?

Yes, Earth has moved gradually between **glacial** events (lots of ice) and **interglacial** periods (warmer weather) over time.

A whole section of glacial events and interglacial periods of time is called an ice age. We are actually in an interglacial time now.

The last glacial period finished around 7000 years ago, paving the way to the climate and temperatures we know today. There have been seven cycles of glacial/interglacial periods in the last 650 000 years.

We are technically in an ice age right now. Called the Quaternary Glaciation, it started 2.6 million years ago when the Arctic Ice Cap appeared.



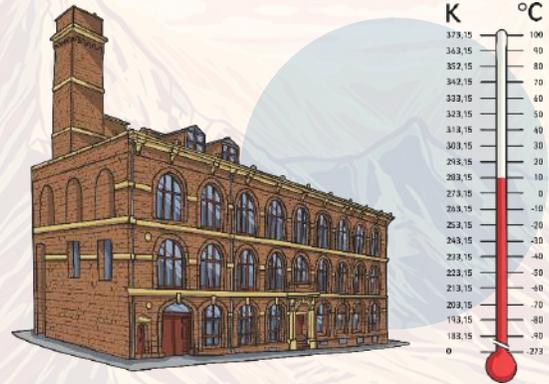
Did you know?

# What Is Different about This Temperature Change?

The difference between temperature changes in the past is that they have happened at a much slower rate than recent years. It doesn't seem much but an increase of 1°C in 100 years is a quick rise.

Scientists are also 95% sure that there is a direct link between human activity and global temperature rises.

The other difference is that there have already been consequences of the warming and this is only set to get worse if nothing is done to stop it.



Most of this temperature increase has happened in the past 35 years. Since 2010, we have had five of the warmest years on record.

Did you know?

# What Is Causing the Warming?

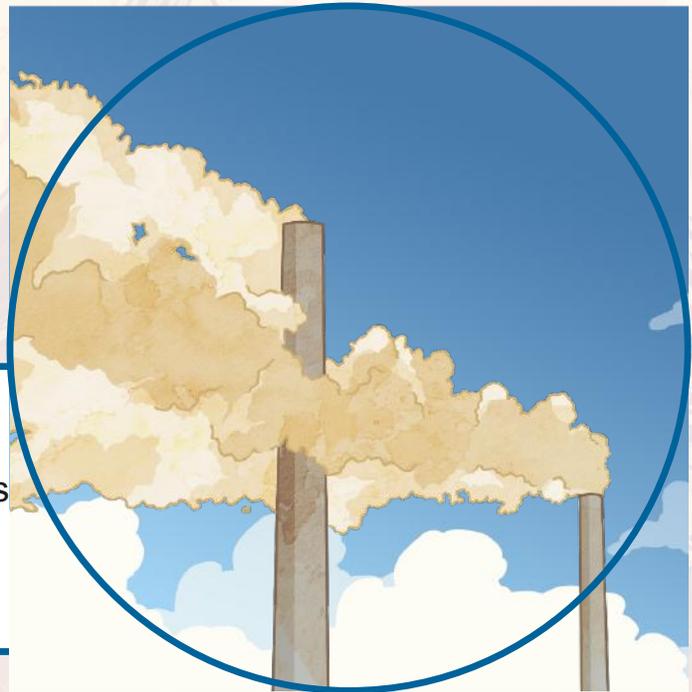
The main cause of global warming is an increase in carbon dioxide (CO<sub>2</sub>) and other gases in Earth's atmosphere.

Carbon dioxide is one of a number of gases in the atmosphere called 'greenhouse gases'.

Other greenhouse gases include methane, water vapour, nitrous oxide and ozone (O<sub>3</sub>).

## **What do greenhouse gases do?**

To really understand Global Warming, we need to understand what these gases do when they are in our atmosphere. And to understand that, we need to first have a look at how a greenhouse works.



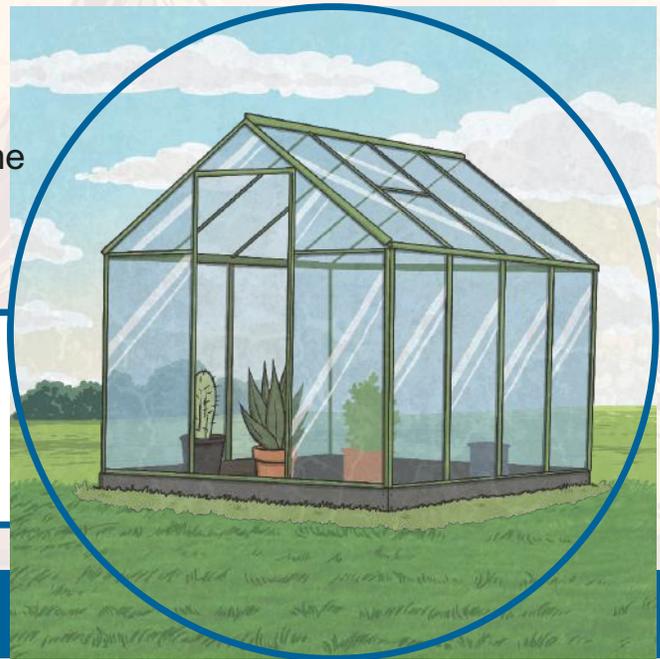
# The Greenhouse Effect

A garden greenhouse is made from glass or plastic which lets in sunlight and heat. Most of the heat cannot escape back out again and it is trapped inside, making it a better environment for plants to grow.

## **What does this have to do with gases?**

Gases in Earth's atmosphere have the same effect as the glass in a greenhouse, this is where they get their name.

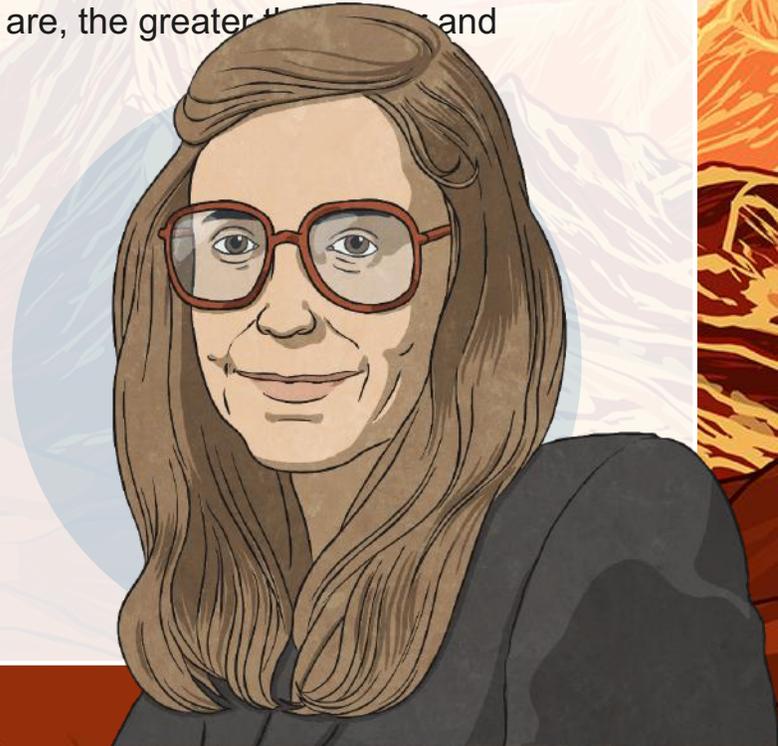
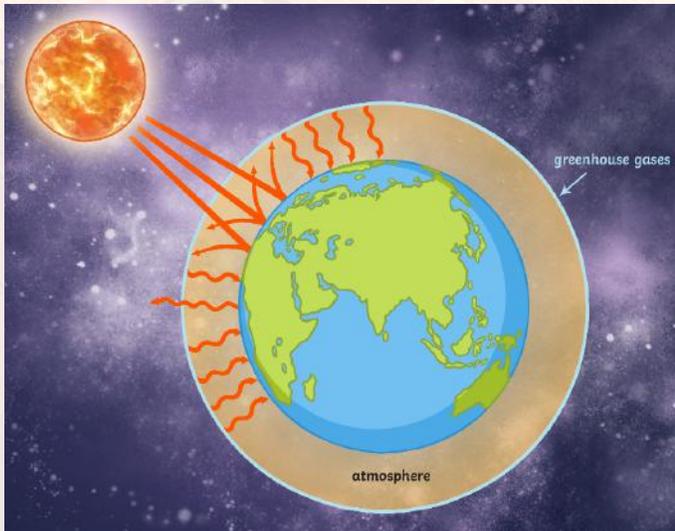
Even a garden greenhouse can get too hot sometimes. However, when that happens, doors and windows can be opened.



Did you know?

# Greenhouse Gases at Work

The greenhouse gases in Earth's atmosphere, such as methane, ozone and carbon dioxide, form a barrier, separating it from the outside space. Light and heat from the Sun can travel through the gases into the Earth's atmosphere but much of this heat cannot escape back out. This makes Earth warm enough to live on. However, the more of these greenhouse gases that there are, the greater the effect and therefore the warmer the planet.



# Main Cause 1: Fossil Fuel Pollution

Fossil fuels are things we burn to get energy and include coal, oil and gas. These are burnt to make energy to run cars, power factories and make electricity. These fuels come from the ground and have taken millions of years to form. Because of this, there is only a limited supply of fossil fuels and we can't make new fuel once we have used what we have.

The trouble with fossil fuels is that when they are burnt, they make CO<sub>2</sub>, which is a greenhouse gas.

Oil is the main ingredient in plastic.



Did you know?

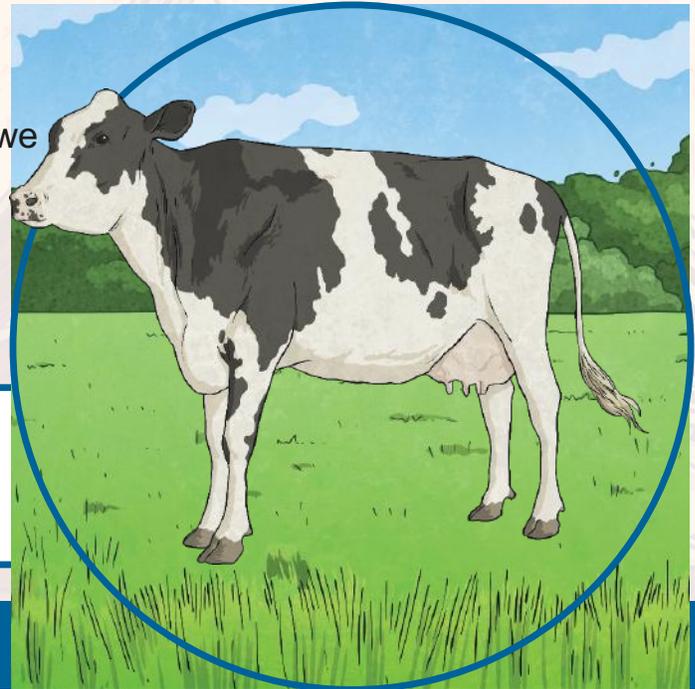
# Main Cause 2: Farming

Methane is another greenhouse gas that we already have too much of.

Methane is one of the gases that cows make by burping and trumping. So, the more we farm cows and the more cows we have, the more methane is made.

There are around 1.5 billion cows in the world... that's a lot of methane!

The negative impact of methane in the atmosphere is 23 times worse than carbon dioxide!



Did you know?

# Main Cause 3: Deforestation

We know that plants and trees take in carbon dioxide and give out oxygen during the process of photosynthesis. This makes them the perfect companions for humans on Earth as we take in oxygen and give out carbon dioxide.

~~More trees would mean less~~ However, forests are being chopped down at an alarming daily rate for cheap farming and also for the production of palm oil.

Palm oil is used in nearly half of products found in a supermarket from shampoo to pizza!

Did you know?



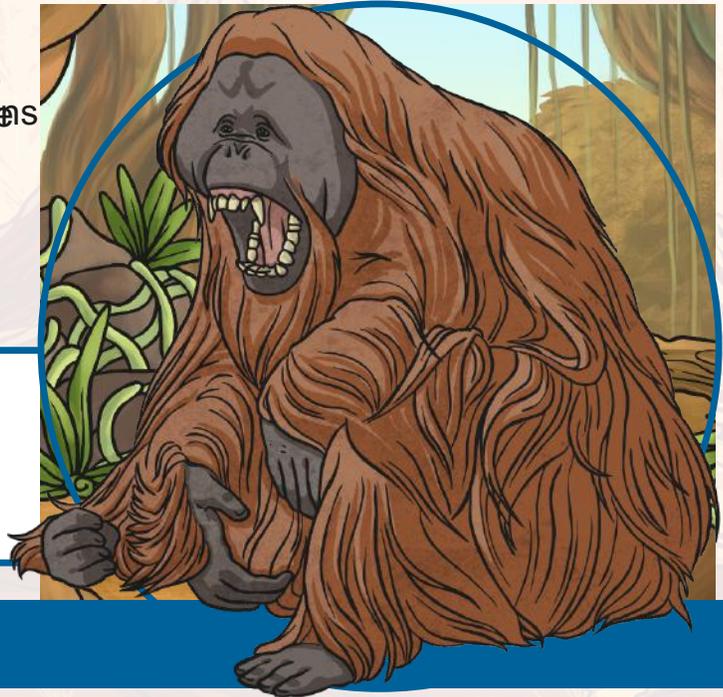
# The Effects on Animals

As forests disappear and the world warms up, many animal habitats are disappearing or changing for good.

As sea levels rise and glaciers melt, affecting wildlife like polar bears, penguins and seals. As the Arctic and Antarctic are melting, the habitat they need.

Orangutans are losing their rainforest homes.

It is predicted that by the year 2050, if nothing is done, we could see 20–30% of the animal and plants species on Earth becoming extinct.



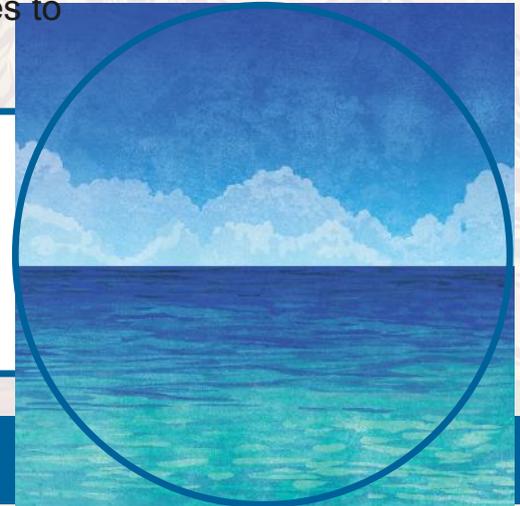
Did you know?

# The Effects on Humans

Humans will not escape the negative effects of global warming either. As temperatures rise, the climate will change too.

Weather will change and become more unpredictable. Something called the jet stream, which currently brings warm air to the UK, could be diverted and cause the UK to actually become colder! As ice melts, the seas and oceans will rise and this will cause places to flood and some parts of countries to disappear underwater.

A jet stream is found around six miles up in the atmosphere and is a channel of wind. They can be thousands of miles long and aeroplanes often fly through them, getting a little help along the way (if going in the same direction).



Did you know?

# What Can We Do?

There's plenty we can do at an individual level as well as supporting change at a higher level.

Have a think about what might help and then check some of our ideas below...

Don't waste water.

Use less plastic.

Look for sustainable labels on items, such as checking for sustainable palm oil.

Use cars less and  
walk or cycle more

Keep up to date with  
the latest news

Create less rubbish.

Look at how 'green'  
your diet is

Keep up to date with  
the latest news

Don't leave electrical  
items on 'standby'

Recycle everything  
you can.

Take your own shopping  
bags to shops.



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