

Climate Change



Glasgow Kelvin College





On completion of this course, you will be able to:

Identify key features of climate change

Identify causes of climate change

Identify effects of climate change

Identify climate action(s)

Draw conclusions using numerical or graphical data





Key Features of Climate Change

What is it?

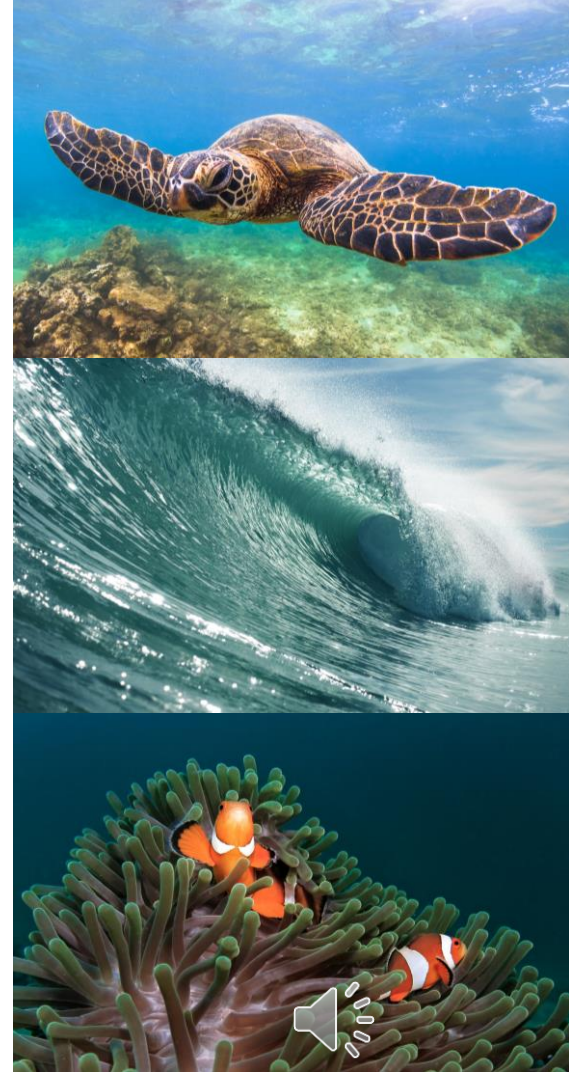


The Key Features of Climate Change

What is climate change?

A long-term change in the Earth's overall temperature and weather conditions

Human activities are causing world temperatures to rise, with more intense **heatwaves** and **rising sea-levels** among the consequences



Sea Level Rise

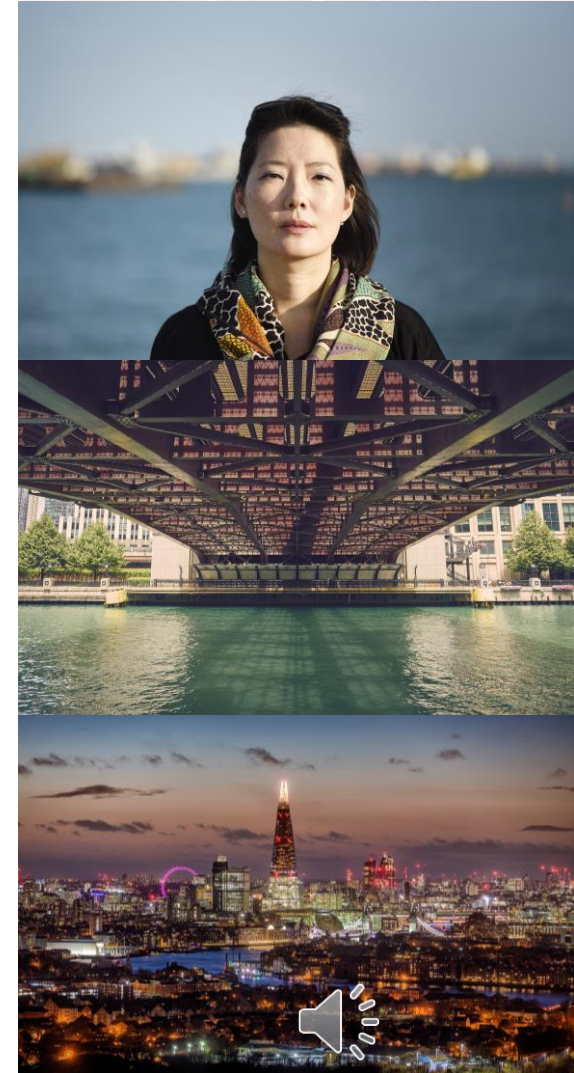
Global Warming can cause sea levels to rise due Ice Cap/Glacier Melt and Thermal Expansion

On average sea levels are currently rising 3.4mm per year

It is currently estimated that by 2050 sea levels may rise by 30cm

If the predicted rise in sea levels by 2050 occur, it is estimated that there will be 150 million people affected

11 of the world's 15 largest cities are on the coast or a river estuary. They are Tokyo, Shanghai, Mumbai, Osaka, Cairo, New York, Dhaka, Karachi, Buenos Aires, Kolkata, Istanbul)



The Key Features of Climate Change

The world temperature today is 1.2 Centigrade warmer than the 19th century.

It has now been confirmed that global warming exceeded 1.5C across the 12-month period between February 2023 and January 2024.

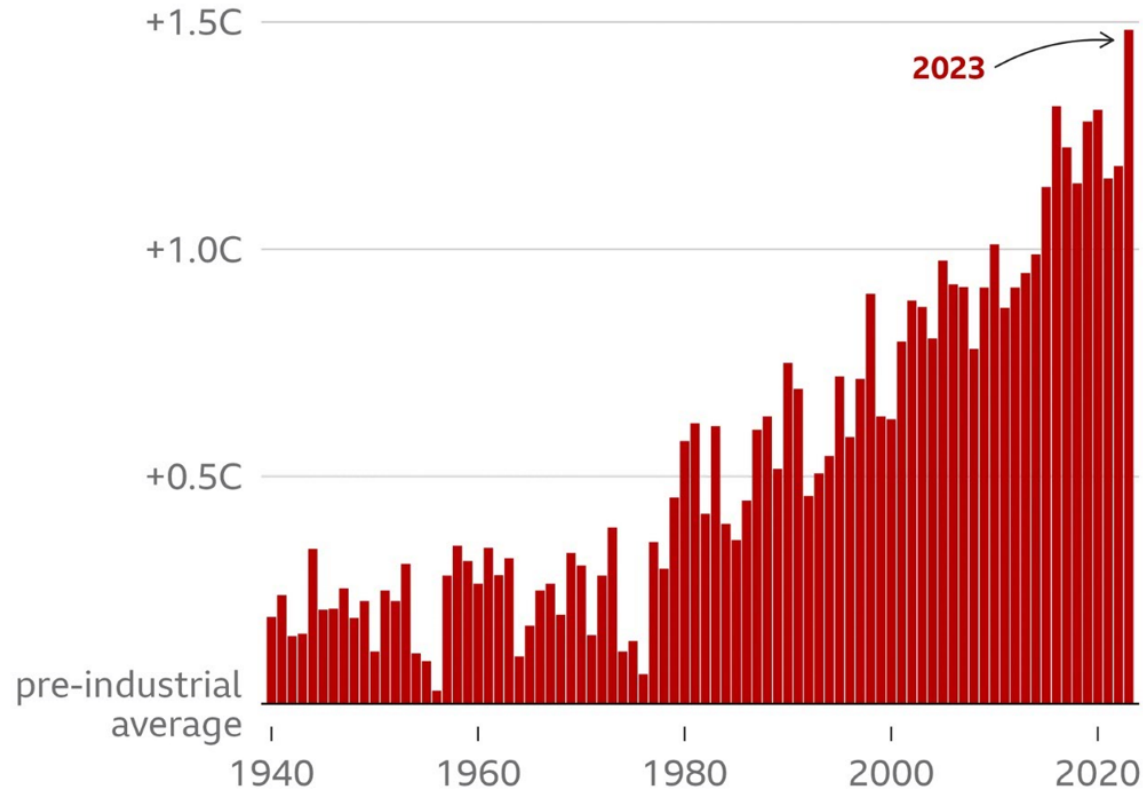
2023 was the warmest on record caused by climate change and El Nino (a natural weather event)



Temperature chart from 1940 until 2023

Hottest year on record

Global average temperature by year, compared with pre-industrial average (1850-1900)



Source: ERA5, C3S/ECMWF





Causes of Climate Change

Who's to blame?



Causes of Climate Change

WHO IS TO BLAME?

- 97% of scientists agree that this long-term climate change has been caused by **human activity**
- The IPCC (the United Nation's Climate Body) says, it is mainly from the widespread use of **fossil fuels - coal, oil and gas** - in **homes, factories and transport.**

IS IT YOU?



Causes of Climate Change

WHO IS TO BLAME?

- This activity has released **greenhouse gases** by burning fossil fuels: coal, oil, and gas (mainly CO₂).
- Greenhouse gases trap heat in the atmosphere and cause the planet to heat up
- CO₂ has increased by 50% since the start of the Industrial Revolution

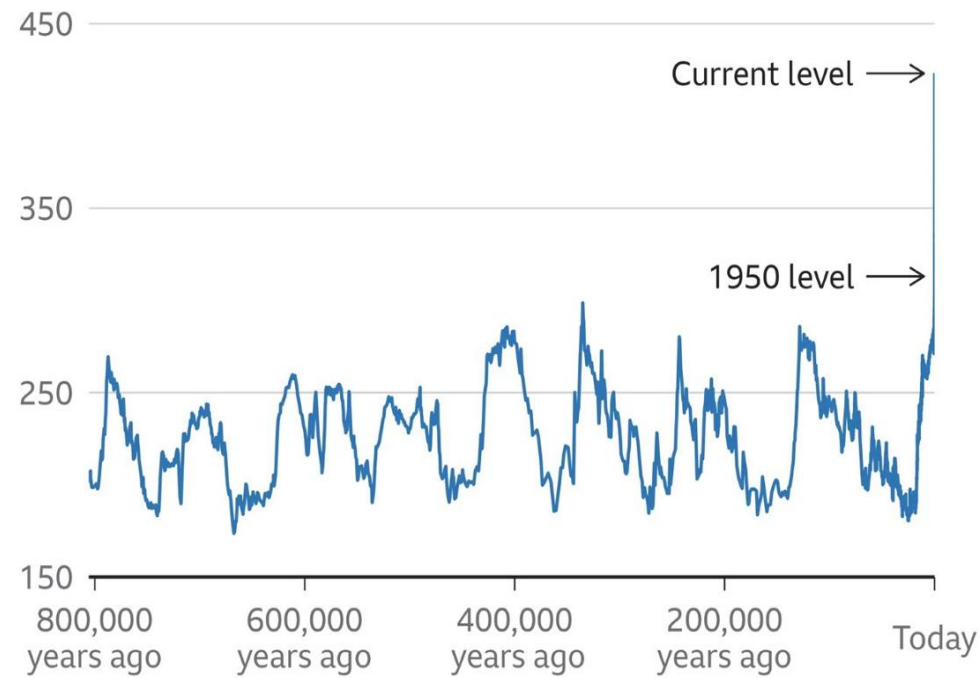
IS IT ME?



Carbon Dioxide Levels over the past 800,000 years

Carbon dioxide levels are higher than any time in the last 800,000 years

Atmospheric CO₂ concentrations, parts per million



Source: NOAA/Bereiter et al., 2015



Climate Justice

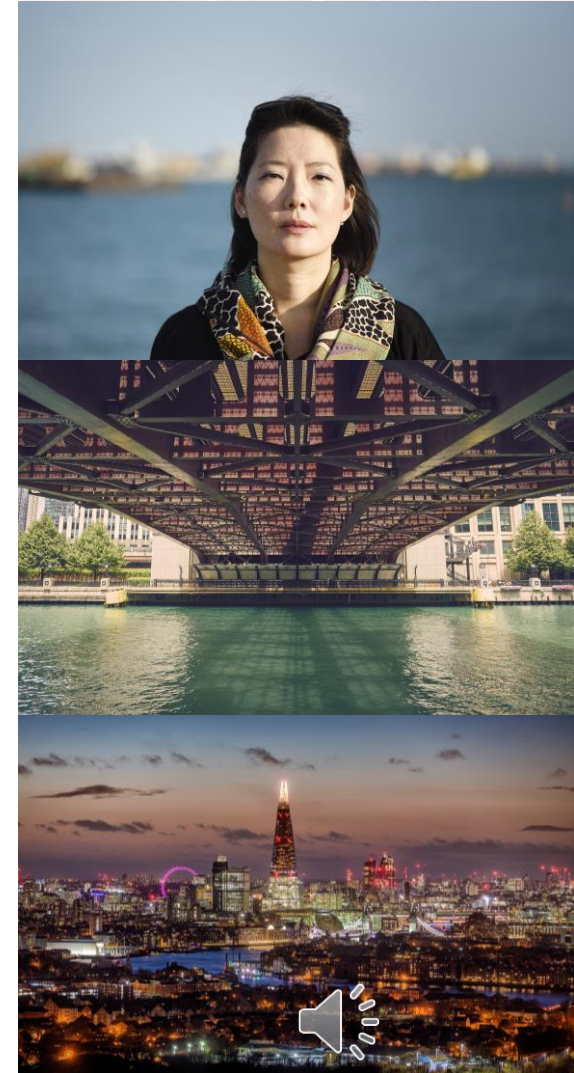
For a 2C rise in global temperatures 50% of the population of Africa would be at the risk of malnutrition.

The 50% of the world's poorest population are responsible for 10% of global Greenhouse Gas emissions.

Canada has the highest emissions per head of population

6 million people are estimated to have taken place in the September 2019 Global Climate Strikes

By 2050 the world must reach net zero Greenhouse Gas emissions to keep the world to no more than a 1.5C temperature rise





The Effects of Climate Change

What does it do?



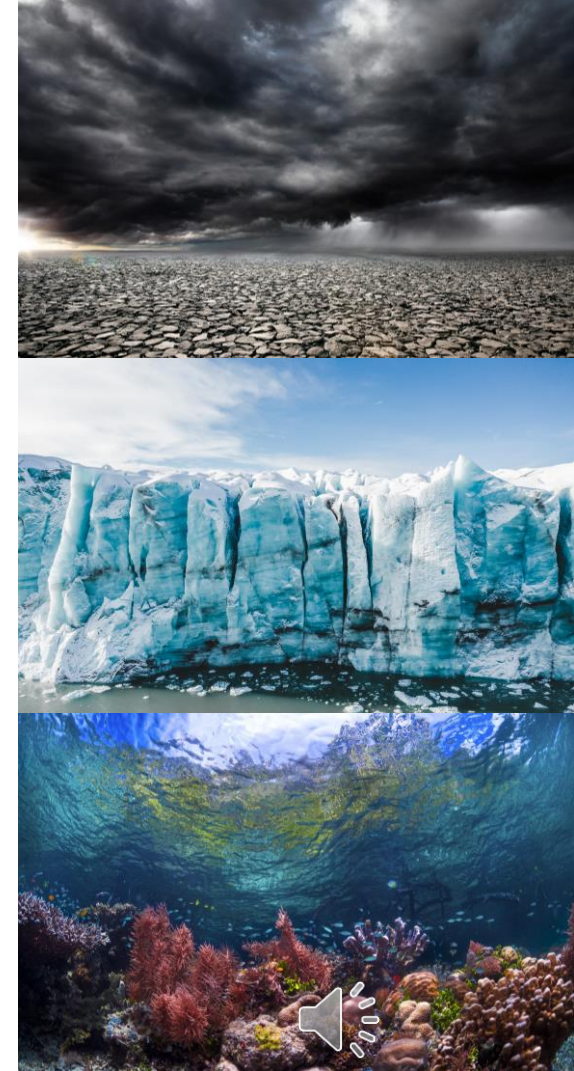
Climate change has a huge effect on the environment

There is more frequent and intense extreme weather, such as heatwaves and heavy rainfall

There is rapid melting of glaciers and ice sheets, contributing to sea-level rise

There are huge declines in Arctic sea-ice

There is ocean warming which harms sea life including coral reefs



This also has an impact on people's lives

For example, parts of East Africa suffered their worst drought in 40 years, putting more than 20 million people at risk of severe hunger.

In 2022, intense European heatwaves led to an abnormal increase in deaths.

About 3.3 to 3.6 billion people are highly vulnerable to climate change, according to the IPCC.

People living in poorer countries are expected to suffer most as they have fewer resources to adapt.





Climate Change Action

What can we do about it?



What are our governments doing about it?

THE PARIS AGREEMENT

- In a landmark agreement signed in Paris in 2015, almost 200 countries pledged to try to keep global warming to 1.5C.
- To achieve this, "net zero" CO2 emissions should be reached by 2050. Net zero means reducing greenhouse gas emissions as much as possible and removing any remaining emissions from the atmosphere.
- Most countries have, or are considering, net zero targets.

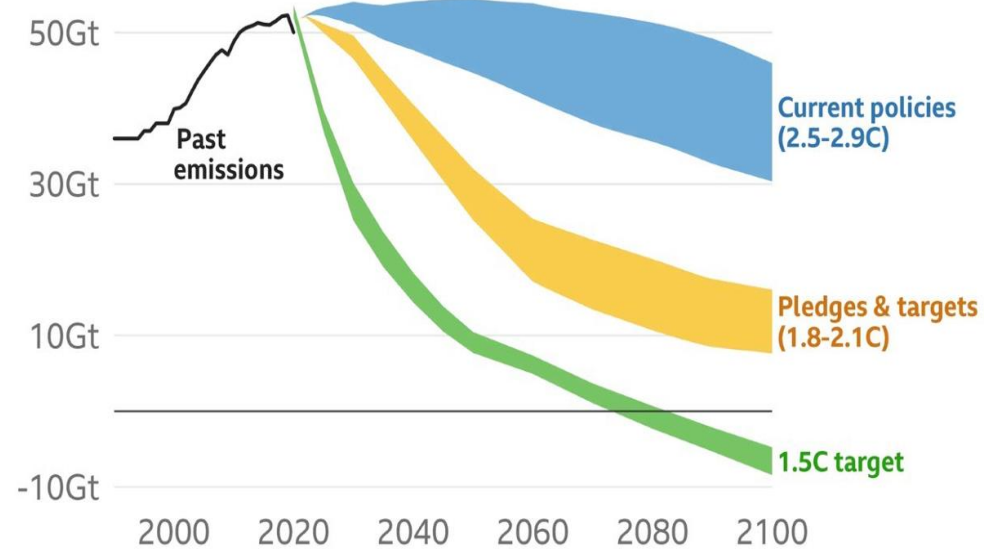
WILL IT BE ENOUGH?



Can our governments keep their promise to reduce CO2?

How close is the world to its 1.5C target?

Projected greenhouse gas emissions and future warming levels vary by actions taken



Emissions measured in gigatonnes of carbon dioxide equivalent

Source: Climate Action Tracker, Dec 2023. Broad lines show possible range **BBC**



What can we do about it?

THE THREE RS

- We can **reduce** the amount we use; **re-use** things and **recycle** things rather than throw them away.
- We can use less energy (switch off lights, computers etc)
- We can insulate our homes and make them more energy efficient
- We can drive electric cars or cycle where possible
- We can eat less red meat

WHAT WILL YOU DO?



Personal Behaviours

Beef emits the highest amount of CO₂e

Apples have the lowest carbon emissions for a person consuming these foods in the U.K

Switching to one meat-free day per week can reduce a person's annual carbon footprint to the same extent as not driving a car for a month

Buying new clothes emits the most global Greenhouse Gases per year

If a person cycled for 5 miles a day, instead of driving, 500kgs of Greenhouse Gas emissions would be saved annually





Before you go!

Hear what **Bill Nye** (the Science Guy) has to say about Climate Change

Climate Change 101 with Bill Nye | National... Share Info

Climate change - Climate change refers to long-term...

Climate Change

Real and Serious Issue

MORE VIDEOS

0:06 / 4:10 • What is climate change