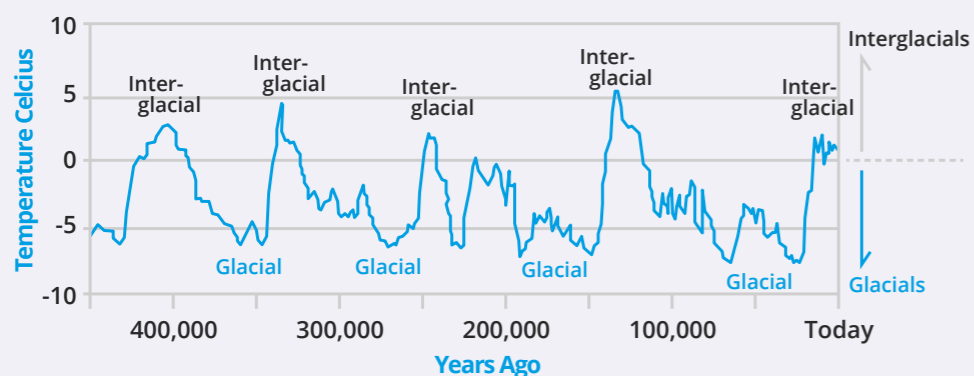
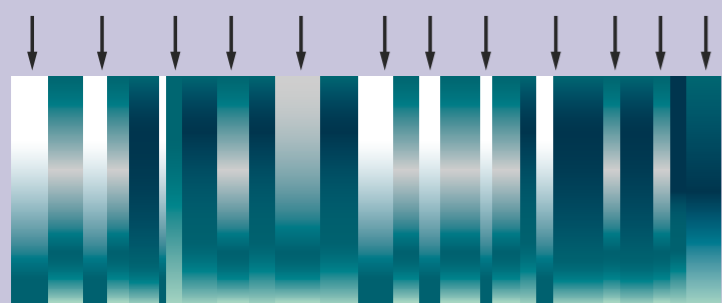


5.1.1 and 5.1.2 What are the causes of, and evidence for, climate change?



Over the latter part of the **Quaternary period**, our planet's climate has formed a cyclical pattern of **glacial** and **inter-glacial** periods caused by natural factors such as the **Milankovitch Cycles**, volcanic eruptions and **solar output**.

One of the ways we know this is because we have evidence from chemicals and trapped gasses in ice cores. Thousands of years of snowfall at our poles have built up into ice sheets thousands of metres thick. We can drill down into these sheets to collect evidence of climatic changes over the last 420,000 years.

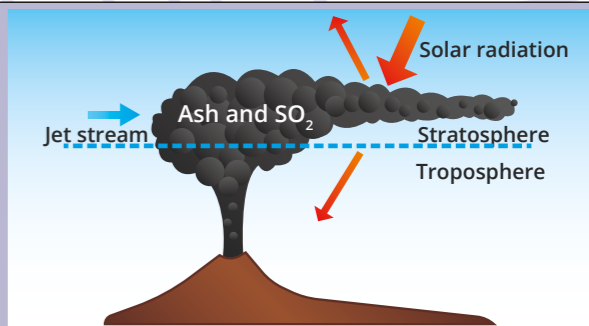


Ice core sample showing the layers of snow fall during summer (lighter bands) and winter (darker bands).

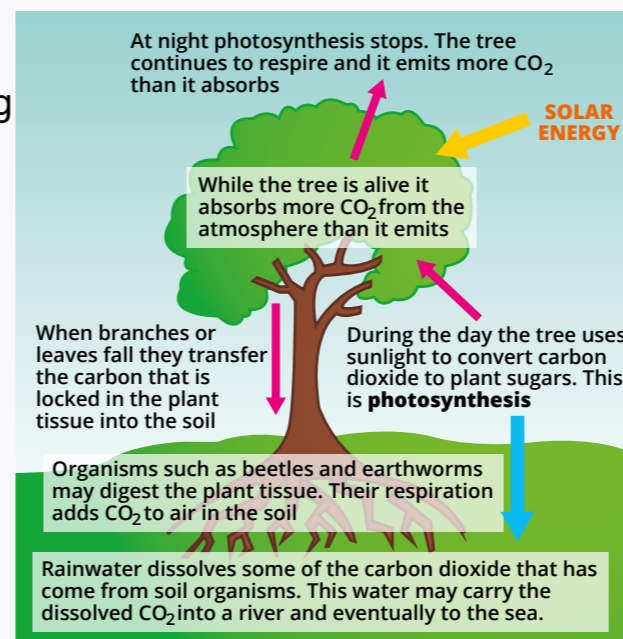
They show that both temperatures and CO₂ levels have gone up and down as part of a natural cycle which can be clearly seen due to the large period of time we can measure over.

Other evidence of climate change such as tree rings and historical evidence are not as strong because written accounts and paintings can be bias whilst tree growth can be affected by things other than climate and neither can cover as large a time period so patterns cannot be proven.

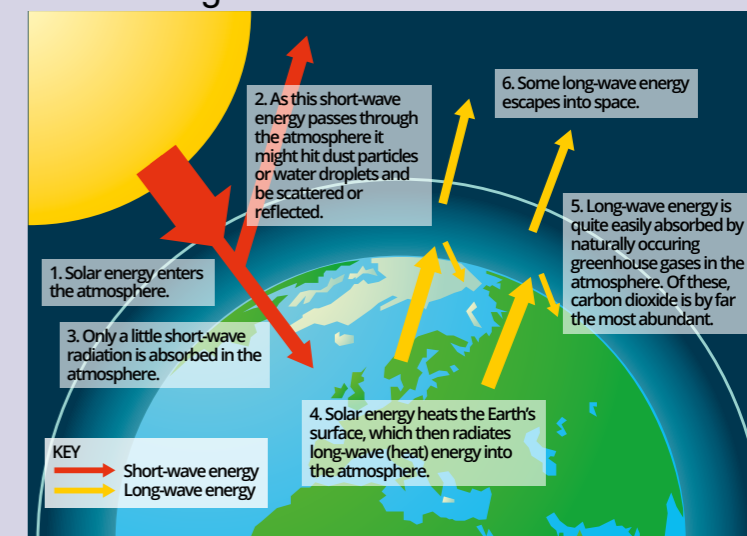
Large volcanic eruptions have enough power to propel ash and SO₂ **aerosol** particles into the stratosphere, above the rain clouds so they aren't washed back to earth. High winds spread these particles, blanketing the planet, which block the sun's rays and send them back into space causing a fall in global temperatures.



The carbon cycle is a series of **stores** and **flows** that lock carbon and move it between living things, land, sea and our atmosphere. Human activities such as deforestation and the burning of **fossil fuels** affect the carbon cycle by releasing carbon quickly from these stores and adding huge amounts of CO₂ into the atmosphere.



The **enhanced greenhouse effect** describes the process where increasingly large volumes of greenhouse gasses in the atmosphere (such as CO₂) caused by human activities (such as burning fossil fuels) absorb even more of the escaping long wave energy and cause our atmosphere to warm up. This heat is re-radiated back to the planet causing global warming.



Milankovitch Cycles	Describe how the earth's orbit changes meaning the earth is sometimes closer and sometimes further away from the sun.
Solar output	The amount of energy given off by the sun. Often determined by the number of sunspots.
Glacial and Interglacial	Periods of colder and warmer global temperatures.
Quaternary period	The most recent geological timeframe covering the last 2.6 million years.
Aerosol	Suspension of fine particles of dust and liquid droplets in the air.
Stores	A place where carbon is kept and collected.
Flows	Where carbon is moved from one place to another.
Fossil fuels	A store of carbon made from the remains of living organisms. Coal, oil and gas.