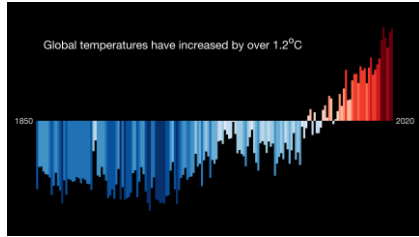


13. What is Earth's climate future?

What is climate change?



Evidence for climate change



NATURAL CAUSES OF CLIMATE CHANGE

ORBITAL THEORY

- The Earth's orbit is sometimes circular, and sometimes more of an ellipse (oval)
- The Earth's axis tilts. Sometimes it is more upright, and sometimes more on its side.
- The Earth's axis wobbles, like a spinning top about to fall over.



SUNSPOT THEORY

- The Sun's output is not constant. Cycles have been detected that reduce or increase the amount of solar energy.
- Temperatures are greatest when there are plenty of sunspots – because it means other areas of the Sun are working even harder!



THE ERUPTION THEORY

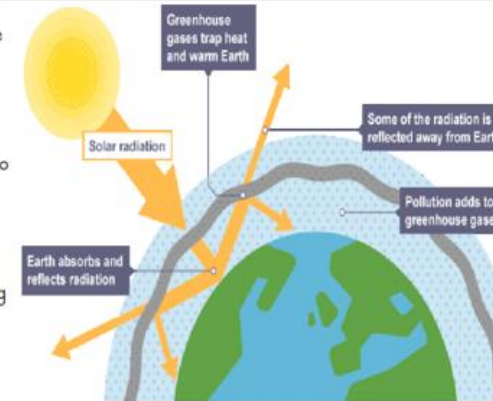
- Volcanic eruptions produce ash and sulphur dioxide gas. This is circulated globally by high level winds.
- The blanket of ash and gas will stop some sunlight reaching the Earth.
- Instead, the sunlight is reflected off the ash/gas, back into space.
- This cools the planet and lowers the average temperature.



THE GREENHOUSE EFFECT

- A natural function of the Earth's atmosphere is to keep in some of the heat that is lost from the Earth.
- The atmosphere allows the heat from the Sun (short-wave radiation) to pass through to heat the Earth's surface.
- The Earth's surface then gives off heat (long-wave radiation).
- This heat is trapped by greenhouse gases (eg methane, carbon dioxide and nitrous oxide), which radiate the heat back towards Earth.
- This process heats up the Earth.

HUMAN CAUSES OF CLIMATE CHANGE

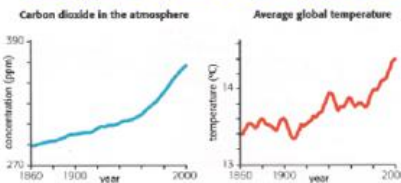
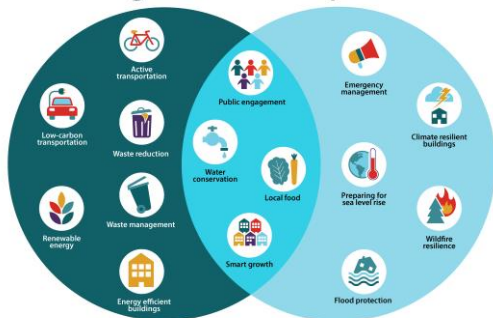


HUMAN FACTORS INCREASING WARMING

- Burning fossil fuels, eg coal, gas and oil – these release carbon dioxide into the atmosphere.
- Deforestation - trees absorb carbon dioxide during photosynthesis. If they are cut down, there will be higher amounts of carbon dioxide in the atmosphere.
- Dumping waste in landfill - when the waste decomposes it produces methane.
- Agriculture - agricultural practices lead to the release of nitrogen oxides into the atmosphere.

Mitigation

Adaptation



- Carbon dioxide (CO₂) is a greenhouse gas.
- As technology has developed and the population on earth has increased, the amount of CO₂ has increased since 1860.
- Data clearly shows that although temperatures have fluctuated since 1960, the general pattern is that global temperatures have increased as CO₂ levels rise.

13. What is Earth's climate future?

What can we do?



CLIMATE CHANGE

The negative impacts of climate change on the environment and human beings by the end of the 21st century, unless we do all we can to reduce greenhouse gas emissions.

