


Hot topic



Climate change is one of the most serious challenges facing our world today. Our planet is experiencing significant and accelerated climate change that began over a century ago.

Most scientists agree that the planet is warming up faster than ever because of the vast amount of greenhouse gases that humans are pumping into the atmosphere. This includes activities such as burning fossil fuels (coal, oil and gas), driving cars and cutting down forests.

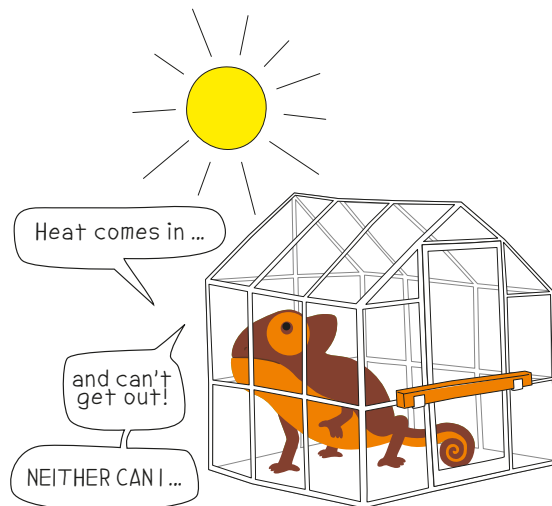
Many of us have seen – and even experienced – the effects of climate change. But it is not just about extreme weather like floods, droughts and hurricanes. Slower and less noticeable changes in our climate have the potential to completely alter the way we live.

The good news is that in Paris in December 2015, 195 countries (practically the whole world) agreed the first ever legally-binding global deal to tackle climate change. In the EU and around the world, governments, companies and individuals are already working to tackle its causes and adapt to the changes it brings. We all have a part to play because climate change is a global problem which can affect each one of us.

We all share one planet and the changes we make in one place can affect others far away. You could say our behaviour makes a lasting impression, like a footprint. So, through our actions and choices, each one of us can take steps to leave smaller footprints and help tackle climate change.

The science bit

Earth's climate has changed throughout history, gradually getting hotter or colder for long periods of time. In the last million years there have been about 10 ice ages, with much warmer periods in between. These changes were the result of natural causes, such as changes in the tilt of the planet, the sun's activity and ocean currents. But the changes we are seeing today are different – and we are responsible! By releasing more of the gases that trap heat into the atmosphere, we are causing the temperature on Earth to rise very quickly.



The greenhouse effect

When sunlight hits the Earth's surface, some of this energy is absorbed and warms the ground and the oceans. The rest of the energy can escape back into space, but some of it is trapped in the atmosphere and warms the Earth. This is called the 'greenhouse effect', because the atmosphere acts like the glass in a greenhouse – warming the inside. This greenhouse effect happens because the Earth's atmosphere contains gases such as water vapour, carbon dioxide, methane and nitrous oxide (these are called greenhouse gases). The greenhouse effect is what normally keeps our planet at a comfortable temperature. However, human activities are increasing the amount of greenhouse gases in the atmosphere which makes the greenhouse effect stronger and increases the temperature of the Earth.

What's causing climate change?

Climate change is caused by the increase in the Earth's temperature (global warming) which comes from adding more greenhouse gases to the atmosphere than those occurring naturally. These extra greenhouse gases mainly come from burning fossil fuels to produce energy, as well as from other human activities like cutting down rainforests, agriculture, farming livestock and the production of chemicals.

Weather vs. climate

Weather and climate are different but related things. Weather describes the day-to-day conditions in a particular place – for example, it can be cloudy and wet one day and sunny the next. 'Climate' describes the average weather conditions in a place over relatively long periods of time (e.g. 30 years). Deserts, for example, have a hot and dry climate, while the Arctic and Antarctic regions are cold and dry.

Getting warmer

In 2016, the Earth was around 1.1 °C hotter than it was in the late 19th century – and the average global temperature is set to rise even more over the next century. 1.1 °C may not sound like much, but consider this:

- Most of the warming so far happened in the past few decades, so the temperature rise is speeding up.
- Don't forget, this is an average increase: some places have become much warmer and others colder. For example, the Arctic has become substantially warmer over the last 60 years and could be ice-free in summer by 2040. Europe is warming faster than other areas of the world.
- According to some studies, Earth's temperature during the last ice age was only around 4 °C colder than in the late 19th century.

Did you know?

Levels of carbon dioxide (CO₂) in the atmosphere are higher today than at any time during the last 800,000 years.



The carbon cycle: always on the move

Carbon is everywhere and in all living things – including you! But carbon does not stay in one place – it is constantly moving from one part of the planet to another and changing form. For example, carbon exists in the air mainly as a gas (carbon dioxide, or CO₂) which is absorbed by plants, including trees, and the oceans.

On land, animals, including us, take in carbon when they eat plants and breathe it out during respiration. When plants and animals die, their remains decay and decompose, creating carbon which is absorbed back into the Earth. The carbon cycle has kept the proportion of the gas in the atmosphere more or less stable for thousands of years.

However, this fine balance is being upset by human activities that either release CO₂ faster than it can be removed naturally, or reduce natural stores of carbon such as through deforestation of tropical rainforests. This increases the amount of CO₂ in the atmosphere, and because CO₂ is a greenhouse gas, this causes the Earth's temperature to increase.

Is the hole in the ozone layer responsible for climate change?

No! Ozone is a very useful gas high up in the Earth's atmosphere that absorbs harmful ultraviolet radiation from the sun. When scientists realised that man-made gases used in fridges and aerosols were making a hole in the ozone layer, the international community set about phasing them out. An agreement called the Montreal Protocol was drawn up to gradually reduce the use of these dangerous substances called chlorofluorocarbons (CFCs).

Efforts have been so successful that the ozone layer is on track to recover by the middle of the 21st century. Unfortunately, the CFCs – and their successor substances – were eventually replaced by fluorinated gases, known as F-gases. These have no effect on the ozone layer but are powerful greenhouse gases. Once again, the world is taking action: in October 2016, the 195 countries that signed the Montreal Protocol agreed to limit their use of these harmful gases. The EU is now leading the world in restricting their use and finding alternatives to them. By 2030, EU emissions of F-gases will be cut by two-thirds compared to 2014 levels.



Did you know?

Without the greenhouse effect, the average temperature on Earth would be a chilly -18 °C instead of the comfortable 15 °C it is today – far too cold for plants and animals, including us, to survive!

Fossil fuels – like coal – are the remains of ancient plants and animals buried deep in the ground for millions of years that have turned into substances that can be used as fuels.



Did you know?

Did you know that the European Union has its own satellite programme for observing the Earth? It's called Copernicus and it's the most advanced system in the world for monitoring the planet. Copernicus is made up of six families of satellites – 'Sentinels' – which beam down high-definition images of land and sea. The images can be used by anyone, for free, for many purposes including tracking changes in the climate and environment.