

## Climate Change

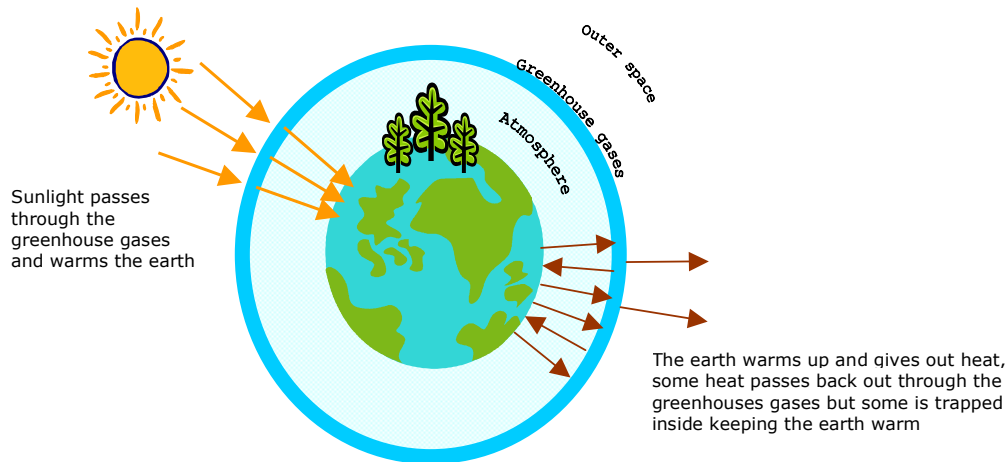
Climate change is happening to our earth and we can help to slow down the process by saving energy, using sustainable transport and being more eco-thoughtful.

### What is the 'climate'?

- The term 'climate' normally describes the **average weather** we get over a long period of time.
- When our climate changes, the weather we experience locally day to day can also change.
- Over the millions of years of the earth's existence, the climate has changed many times.
- When we use the term 'climate change' here, it is to describe more dramatic **shifts** in climate over approximately the last 100 years and the next 100 years or so. There is presently a dominant **warming trend**.

### What causes climate change?

- There is almost unanimous scientific agreement that significant global warming is occurring and that most of the recent warming can be attributed to **human activities**.
- The earth is surrounded by a blanket of gases which trap the heat from the sun and allow life on earth to exist. These are called '**greenhouse gases**'.



- One of these naturally occurring gases is **carbon dioxide**. The amount of carbon dioxide in the earth's atmosphere has fluctuated over time due to natural cycles.
- Scientific research has demonstrated a direct link between the surface temperature of the earth and CO<sub>2</sub> levels. As CO<sub>2</sub> levels have risen, so the earth has warmed.
- The majority of scientists are now in agreement that, due to the activities of humans since the industrial revolution, the amount of CO<sub>2</sub> has reached **unprecedented levels** in a short space of time.

### Natural Causes

- Some changes to the earth's climate are caused by the effects on each other of the sun, land, oceans and atmosphere. These generally occur over very **long periods** of time.

## Human Causes

- Over the past 200 years, human activity has changed the concentration of greenhouse gases in the atmosphere in two important ways.
- First, we have **cut down forests** to develop land for agriculture. Trees absorb carbon dioxide and convert it into oxygen as part of the photosynthesis cycle. Collectively trees act as a 'carbon sink', storing large amounts of carbon in their system until they are either burnt or decompose. With fewer trees, **less carbon dioxide is absorbed** from the earth's atmosphere. In many cases, the agriculture that replaces the forests such as cattle farming can often be a further source of emissions.
- Second, by **burning fossil fuels** such as coal, oil and gas for energy, we are releasing greenhouse gases. Currently, the burning of fossil fuels emits about 6.5 billion tonnes of carbon dioxide into the atmosphere each year. Since the industrial revolution, which began in the 18th century, concentrations of greenhouse gases have increased by 30 per cent.

## What effects will climate change have?

Even if we stop burning fossil fuels and cutting down forests today, the world's climate will still warm in years to come. There is a time lag between when the emissions occur and when we begin to feel their effects, so we have yet to experience the impact of the greenhouse gas emissions from the last 30–40 years. Scientists have identified the likely effects of this, some of which can already be observed today.



## Rainfall

- Some regions will experience more **extreme rainfall** while others will experience **drought**.
- In the UK, we are already experiencing **wetter winters and drier summers** causing water shortages in reservoirs throughout the South of the country.
- There have already been cases of flash **flooding** in the UK and this will continue as the climate changes.



## Sea level

- The sea level could rise by more than 40 centimetres by the end of the century. There are two reasons for this. First, as the water in the oceans warms, it expands. Second, ice from the polar caps and from glaciers is melting into the sea.
- Rising sea levels place low-lying **coastal areas at risk**.
- The Thames Barrier that protects London from flooding was designed to be raised only once every six years, in recent times it has been raised six times a year.

## Wildlife

- Wildlife and habitats will be affected as they may not be able to **adapt** quickly enough to the changing climatic conditions.
- Reports of an early spring in recent years has led to concerns that the wildlife arriving earlier than usual will have **food shortages**.

The following websites provide information about the causes and impacts of Climate Change:

Climate Challenge fund – [www.climatechallenge.org.uk](http://www.climatechallenge.org.uk)

UK Climate Impacts programme - [www.ukcip.org.uk](http://www.ukcip.org.uk)

BBC Weather centre - [www.bbc.co.uk/climate](http://www.bbc.co.uk/climate)