

***be prepared... for the future  
together, Scouts will tackle climate change***

## Fact Sheet 1: So, what is climate change?

### ***What is the 'climate'?***

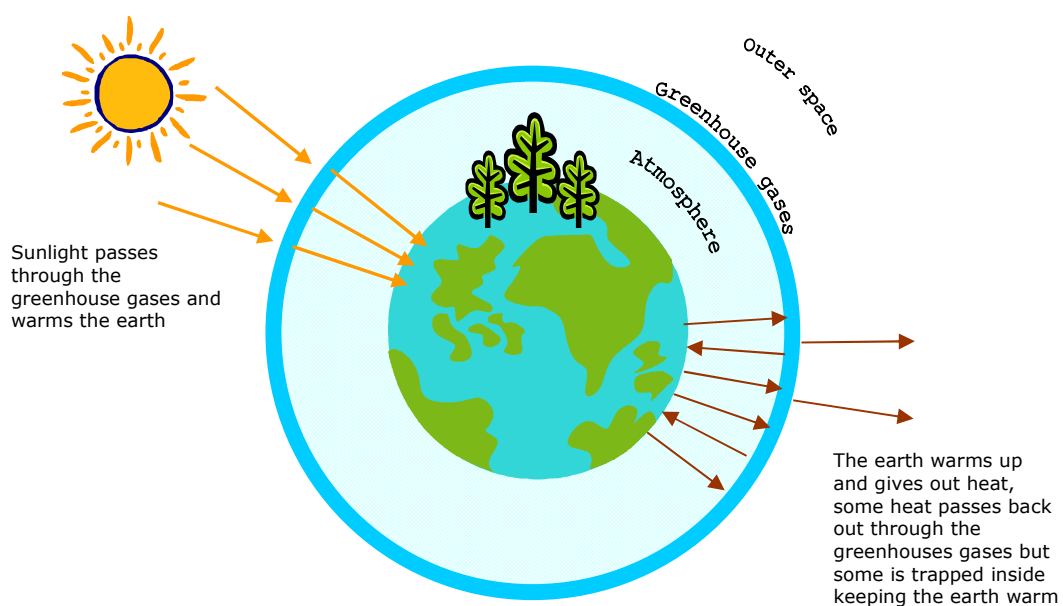
The term 'climate' normally describes the average weather we get over a long period of time. When our climate changes, the weather we experience locally day to day can also change.

Over the millions of years of the earth's existence, the climate has changed many times. However, when we use the term 'climate change' within this project, it is to describe more dramatic shifts in temperature over approximately the last 100 years and the next 100 years or so.

### ***What causes climate change?***

There will always be some degree of uncertainty in understanding a system as complex as the world's climate. However, there is now strong evidence and 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.



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 that these fluctuations can be directly linked to the surface temperature of the earth. 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. This, in turn, is causing the earth to reach the highest temperatures on record, leading to major shifts in the earth's climate.

### **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 fossil fuels emit 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:



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### **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 will completely swamp some small, low-lying island states and put millions of people in low-lying areas at risk.

### **Water**

There will be less water available for irrigation and drinking because there will be less rain. Salt from rising sea levels will contaminate ground water in coastal areas and droughts are likely to be more frequent. This will affect us in the UK but globally three billion more people could suffer increased water shortages by 2080. Northern Africa, the Middle East and the Indian subcontinent will be the worst affected.

### **Harvest**

As temperatures increase and rainfall patterns change, cereal crop yields are expected to drop significantly in Africa, the Middle East and India.

### **Disease**

As temperatures increase, the areas that harbour diseases such as malaria, West Nile disease, dengue fever and river blindness will shift. It is predicted that 290 million additional people could be exposed to malaria by the 2080s, with China and Central Asia seeing the biggest increase in risk.

### **Rainforests**

Higher temperatures and reduced rainfall could mean the loss of large areas of Brazilian and southern African rainforest – on top of the forest that we are cutting down to clear land for agriculture. These forests currently act as a 'sink' by absorbing large amounts of carbon dioxide which would otherwise be released into the atmosphere, compounding the climate change problem.

For more information visit DEFRA's website on the climate challenge – [www.climatechallenge.org.uk](http://www.climatechallenge.org.uk)