PUPIL KS3

Weather and Climate

Weather refers to the conditions existing at one time or on a particular day. When we talk about the weather, we are really describing the conditions in the atmosphere and the air around us at a particular moment. We might describe the weather as cloudy, sunny, wet or windy.

Climate is used to sum up what the weather is usually like at a particular place over a longer period of time, typically 30 years.

Britain's climate is temperate - we rarely experience either very hot or very cold temperatures, and maritime because we are near an ocean. We have seasons with generally warm summers and cold winters, with some rainfall all the year round.

Other types of climate include:

- Mediterranean - hot, dry summers and mild, wet winters, occurring mainly around the Mediterranean
- Tropical rainforest - the temperature is hot and the rainfall heavy all year round, occurring near to the equator
- Polar - cold with ice-covered lands and occurs in the Arctic and Antarctic
- Desert - little or no rainfall and little variation between the seasons, for example in North Africa.

Rain

Much of our weather is to do with water. Air usually has water vapour in it. When moist warm air rises into the sky and is then cooled down, tiny droplets of water form and become clouds. This process is condensation. It can take between a few minutes and an hour for a cloud to form. We get clues about the weather that is on its way, from the type of clouds.

Cumulus Fluffy, low level clouds seen in fine weather.

Cirrus High, wispy clouds. May be a sign of unsettled weather.

Stratus Thick layers of low cloud.

As the air holding the water droplets rises and cools further, the droplets grow and eventually become so large they can no longer float in the air and they fall back to earth as rain.

There are different types of rain, from drizzle which usually comes from low grey cloud, to the fast, heavy rainfall that we get in summer storms. This heavy rain often comes from larger towering clouds.

In the British Isles, it is generally wetter in the west and drier in the east. It also rains more in the winter than in the summer. The more extreme weather tends to occur in mountainous regions where it is often cloudy, wet and windy.

Rainfall in the UK

Different parts of the British Isles get very different amounts of rainfall, from about 5,000mm (200 inches) in parts of the western highlands of Scotland to about 500mm (20 inches) in parts of East Anglia and the Thames Estuary. In fact, East Anglia is drier than many Mediterranean countries!

In western areas, the winter half of the year (October to March) tends to receive over half the annual average rainfall. However, in eastern areas there is not such a marked variation, although they generally have more rain in the autumn and less in the spring than in the other two seasons.

In summer, rainfall often comes in showers and is normally more intense than winter rainfall. The heaviest falls of rain are usually associated with summer thunderstorms when more than 100mm (4 inches) of rain fall per hour for a short period. In most areas, December is the month with the highest number of rainy days.

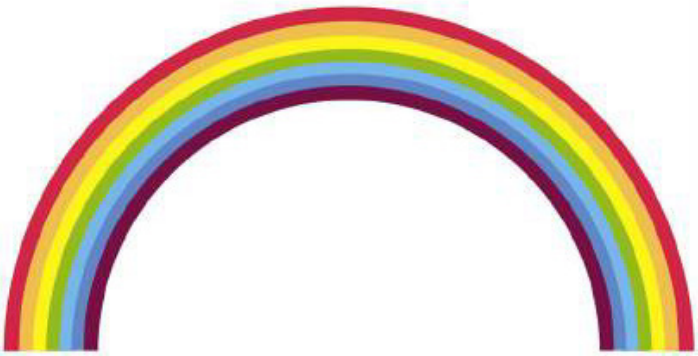
Local rainfall

The air over the sea has a lot of water vapour in it because of evaporation - so most rain falls over the sea. The wind can blow this damp air from the sea to the land which is one reason why we get some the wettest weather in the South West as winds blow in from the Atlantic Ocean.

Rainbows

When it is raining and the sun is shining, we can often see rainbows. To see a rainbow, the sun has to be low in the sky and behind you, and the shower of rain has to be in front of you.

The rays of sunlight are split up by the drops of rain into seven different colours: red (on the outside), orange, yellow, green, blue, indigo and violet (on the inside).



To help you remember the order, think…Richard Of York Gave Battle In Vain. Or try making up your own sentence!

Sometimes you can see a second, fainter, rainbow around the outside of the first one, with the colours in reverse. This happens when the sunlight is split up twice by the raindrops.

Did you know?

On the ground we see rainbows as semi circles.
If you were in an aeroplane you could see a rainbow as a whole circle.
You can find out more about weather and climate https://www.metoffice.gov.uk/

Climate change

Since the end of the last ice age (about 10,000 years ago), the earth's climate has been relatively stable. But scientists now have evidence that our climate is changing.

The average global temperature is warmer than any other century in the last 1,000 years. 2010-2019 was the warmest decade in the last 100 years. Glaciers are retreating, arctic sea-ice is thinning and the incidence of extreme weather is increasing in some parts of the world.

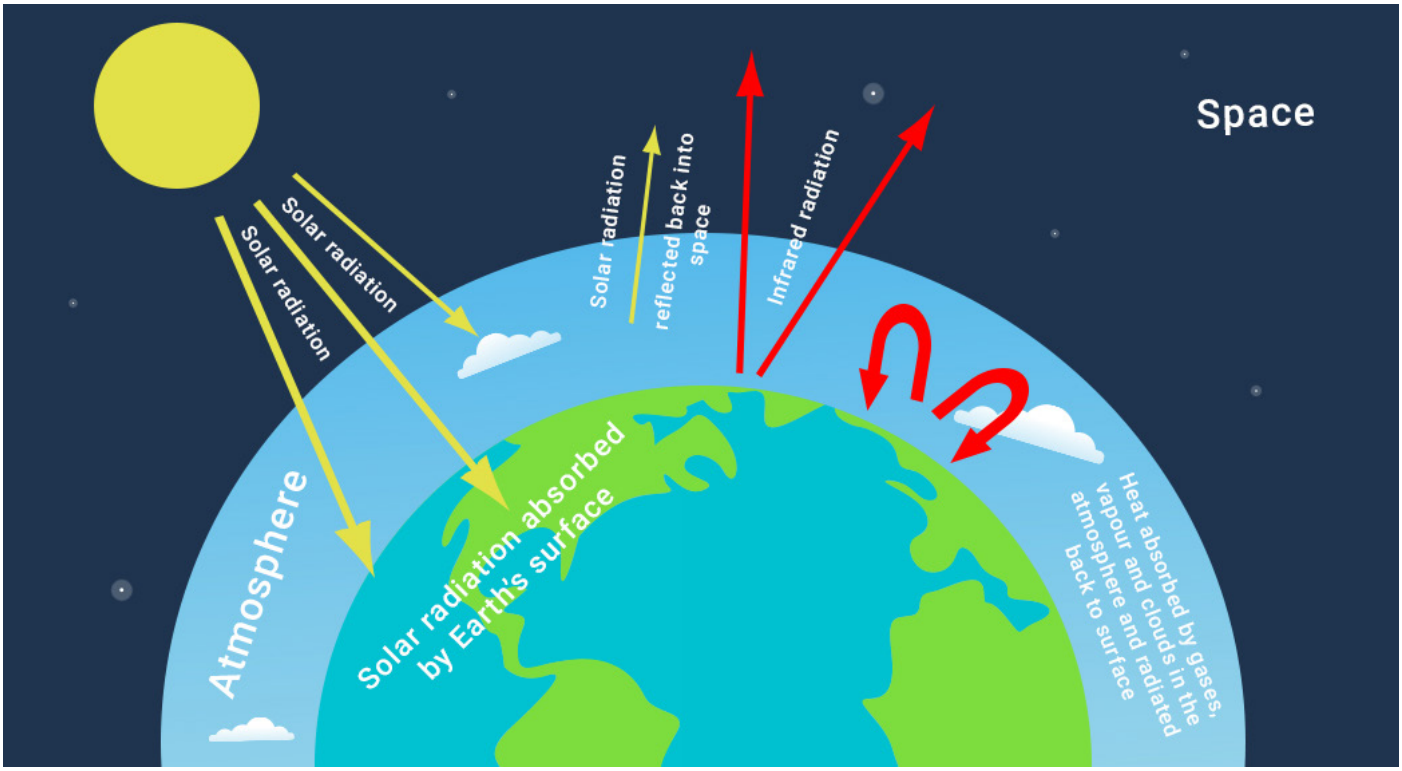
Scientists predict that global mean surface temperatures will rise by up to 5.8°C by 2100. This is likely to modify rainfall patterns and cause sea levels to rise.

In the UK scientists have observed:

- we have more heatwaves in summer
- we have fewer frosts and winter cold spells
- over the last 200 years our winters have become much wetter relative to our summers
- the average sea level around the UK is now about 10cm higher than it was in 1900
- the thermal growing season for plants in central England has lengthened by about one month since 1900
- rainfall patterns are changing

Why is our climate changing?

These changes in global climate are partly natural and partly caused by human activity.



- Energy from the sun passes down through the atmosphere to warm the earth's surface.
- The earth loses some of this energy in the form of infrared radiation which is carried away from the surface by air currents and clouds. This energy eventually escapes to space.
- A blanket of 'greenhouse gases' in the atmosphere traps some of the sun's energy - this greenhouse effect is necessary to keep our planet warm enough to support life.

The main greenhouse gases are water vapour, carbon dioxide, ozone, methane, nitrous oxide and chlorofluorocarbons (CFCs). Some greenhouse gases occur naturally in the atmosphere, while others result from human activities such as burning fossil fuels, deforestation, and many agricultural and industrial processes.

What can you do?

What can you do to reduce the effects of global warming?

- switch off lights, TV and computers when you're not using them to save energy
- walk or cycle to school instead of going in the car - this will cut down on pollution and you will be fitter!
- recycle bottles, cans, newspapers and plastics
- buy recycled products
- dispose of refrigerators correctly at your local refuse point