Knowledge organiser: Y8—What is happening above our heads

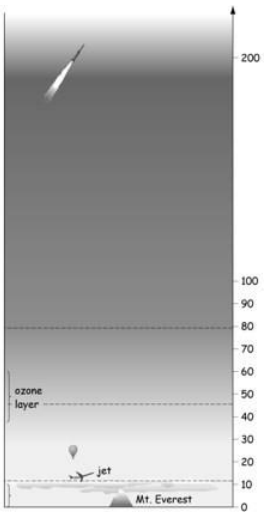
KEY VOCABULARY	
Weather— the day to day state of the atmosphere.	Air Mass—large volumes of air that have the same temperature, pressure and Moisture.
Climate—the average state of the atmosphere over long periods of time (normally 30 years).	Insolation— the amount of solar radiation (rays) reaching a given area.
Atmosphere—the thin layer of gases that surround the planet.	Temperature— How hot or cold the air is.
Global Warming—the gradual increase of earth's surface temperature.	Microclimate— the climate of a very small or restricted area
Air Pressure—The force or weight of the air above us.	Aspect— is the direction which a place is facing

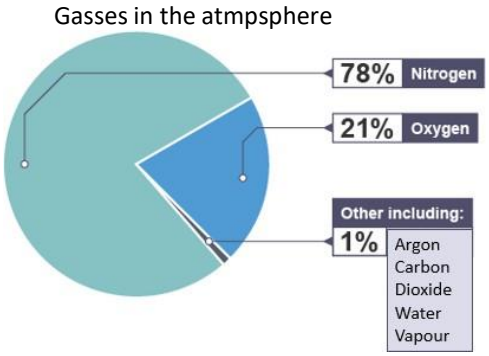
What is in the atmosphere?

The Earth's atmosphere is the relatively thin layer of gases that surround the planet.
It provides us with the oxygen we need to stay alive.

The atmosphere consists of: the troposphere– this is where the weather happens and is closest to earth's Surface.

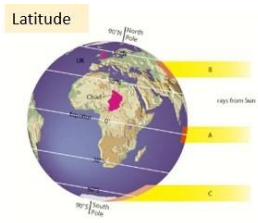
The stratosphere is further away from earth and has a boundary with the troposphere called the tropopause.





What is climate?

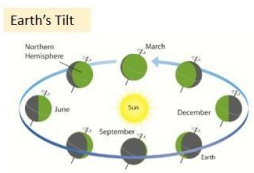
Climate is the state of the atmosphere is like over long periods time. It is made up of average temperature and rainfall of place and can be shown on a climate graph. This is a graph that has two pieces of data on it: temperature and precipitation per month.



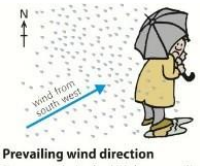
Global climate is controlled by the amount of solar insolation that reaches different latitudes.
At lower latitudes (near the equator) insolation is more concentrated so they receive more heat whereas at high latitudes (near the poles) insolation is less concentrated and more spread out meaning there is less heat and colder temperatures.

What factors affect local climate?

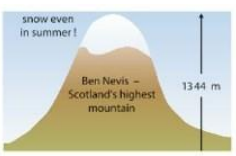
Whilst latitude and insolation control global climates, climates can also vary locally. Local climates can be affected by different factors: Earth's tilt, distance from the coast, prevailing wind direction, altitude.



Distance from the coast



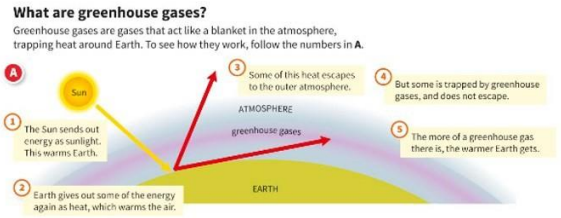
Prevailing wind direction



Height above sea level

How is our climate changing?

The earth's temperature has increased on average by 1 degrees Celsius between 1850 and 2018. However, the earth's warming isn't even. Some places have warmed by less than 0.5 degrees whereas the Arctic (North Pole) has warmed by more than 2.5 degrees C.



Why is our climate changing?

Since the Industrial Revolution in the mid 1800s, the world has used more a more fossil fuels.

Fossil fuels (coal, oil, gas) release carbon dioxide when burnt.

Carbon dioxide is an example of a greenhouse gas.

Greenhouse gases are building up in the atmosphere and trapping the sun's energy.

How is global warming impacting on the hydrosphere?

Due to global warming, the atmosphere is getting warmer too meaning that water vapour is not condensing but staying as a gas in the atmosphere. This means that water vapour is not condensing and falling as precipitation.

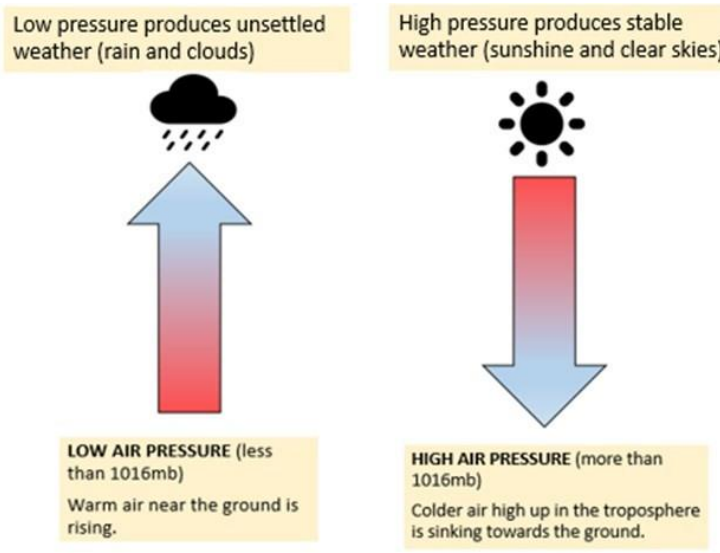
Case study– California, USA.

There is less rainfall in California due to climate change meaning that the USA state is experiencing drought.

The trees in California are very dry and are prone to setting alight and causing wildfires which have devastated some communities.

What can be done? Ultimately we need to reduce the use of fossil fuels so that the atmosphere cools and water vapour can condense.

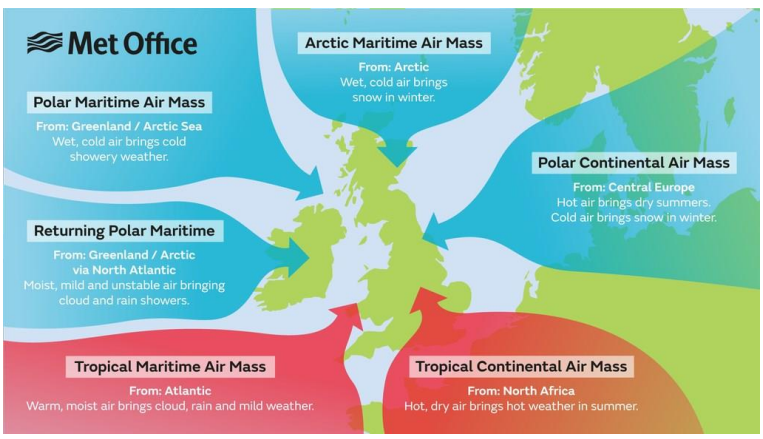
What causes the day to day weather?



Whilst the climate is the average conditions, the weather is the day to day state of the atmosphere of a particular place. The weather conditions of a place are controlled by air pressure. The two different types of air pressure are low and high, both of which have different characteristics and bring different weather conditions in a place.

Local weather conditions are also controlled by air masses (large volumes of air that have the same temperature, pressure and moisture). This is particularly important to the UK which is affected by 5 different air masses.

These different air masses bring the UK's varied day to day weather conditions.



What are the different types of rain?

Rain is brought by low pressure air in a particular place, however when that low pressure air reaches certain latitudes, reliefs and other air masses it creates different types of rainfall.

The UK experiences relief and convectional rainfall the most.

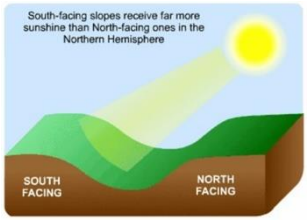
Relief Rainfall – when mountains forces warm air to rise forming clouds and rain.

Convectional Rainfall – when the sun heats the land causing warm air to rise and form clouds and rain.

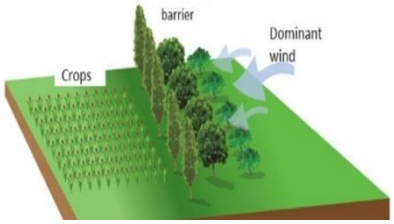
Frontal Rainfall – when warm air meets cold air and the warm air is forced to rise, forming clouds and rain.

What is a microclimate?

A microclimate is the climate (average conditions) of a very small or restricted area, for example a garden, a school or a woods. There are several factors that control the microclimate of an area:

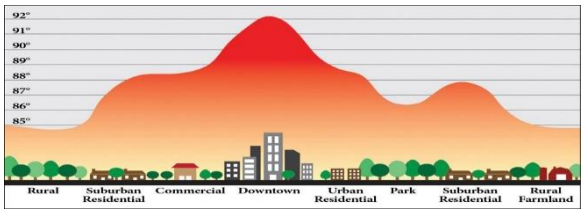


Aspect



Shelter

Surface



Urban Heat Island

Want to know more or check your learning? Use these websites to help!

Scan the QR Code to do some reading on the types of air masses.

Scan the QR Code to do some reading on Climate change.

Interactive tool to see how climate change will effect where you live.

Guide to COP26 – Global Climate Change Conference