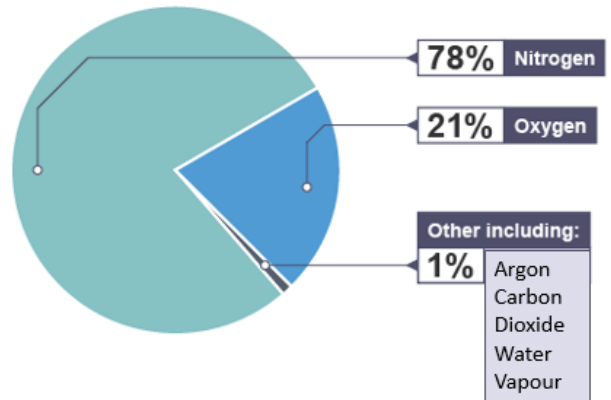


Y8 - What is happening above our heads? (Weather Unit)

What is the atmosphere?

The Earth's atmosphere is the relatively thin layer of gases that surround the planet.

The atmosphere consists of 4 main layers – but the most important layer to humans is the troposphere. This is where the weather happens and is closest to earth's surface.



The gases in the atmosphere are crucial for life on earth.

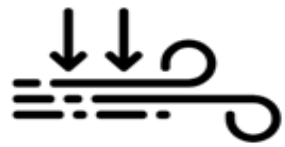
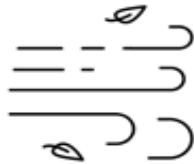
Nitrogen helps plants grow, and oxygen is what we need to breathe; it also makes the ozone layer that protects us from the sun's harmful rays. Carbon dioxide and methane trap heat to keep Earth warm, and water vapor is important for making clouds and rain.

What is weather?

Weather is the state of the atmosphere at a particular place and time referring to precipitation, temperature, wind, humidity, sunshine and air pressure.

Weather has positive and negative impacts on humans. It can help plants grow, increase shopping and travel, and increase energy and water supply, but it can also cause travel delays, health problems, and damage to farms.

How do we measure the different elements of weather?



Precipitation: measured in mm by a rain gauge.

Temperature: measured by a thermometer in °C

Wind Speed/Direction: measured by an anemometer or vane – measured in knots/compass points.

Humidity – amount of water vapor in air.

Sunshine: measured by a Campbell Stokes Sunshine Recorder

Air Pressure: Measured by a barometer in millibars

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, Surface, Urban Heat Island Effect, Shelter and Physical Features.

Microclimates are likely to get worse in the future as more of the world's population move into cities.

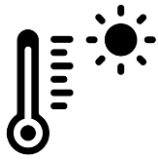


Y8 - What is happening above our heads? (Weather Unit)



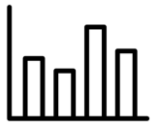
What is the microclimate of Meadowhead school?

Our enquiry question is “What are the different microclimates around Meadowhead school.



Data Collection:

To complete the physical fieldwork we measured temperature and wind speed using a thermometer and a category table across 4 sites around the school.



Data Presentation:

We presented our collected data in located bar graphs as this allowed for easy comparison and able us to easily see if there were any obvious microclimates around the school.



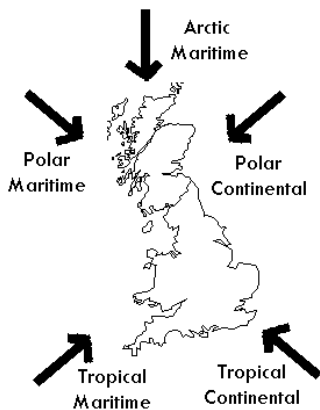
Evaluation

However there were limitations to our fieldwork – for example:

- We only collected the data during 1 lesson on 1 day in 1 particular season.
- Human error in not knowing how to use the thermometer correctly.
- Using a categories table for wind speed was subjective and inconsistent.

Why is the UK weather so changeable?

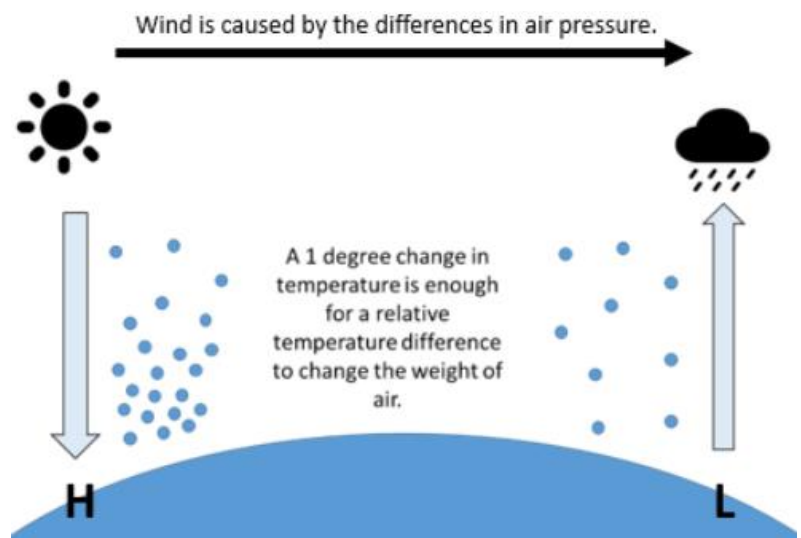
The UK's changeable weather is brought by air masses. Air Masses are large volumes of air that have the same temperature and moisture. Low wind means the air will take on the characteristics of the land they are over. The UK is affected by 5 different air masses.



| Air Masses | Weather it brings |
|---------------------------|-------------------|
| Arctic Maritime (mA) | Very cold |
| Polar Maritime (mP) | Cold and Wet |
| Polar Continental (cP) | Cold and Dry |
| Tropical Continental (cT) | Warm and Dry |
| Tropical Maritime (mT) | Warm and Wet |

Air Pressure: Within these air masses, air will be relatively different temperatures and therefore move differently.

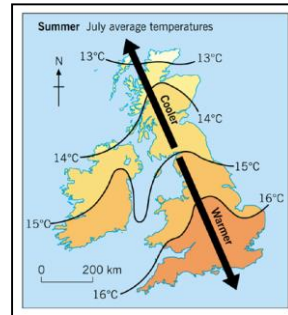
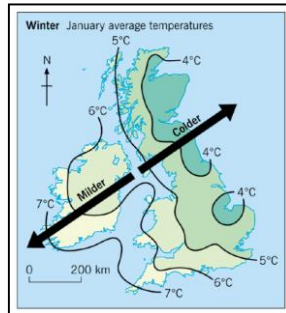
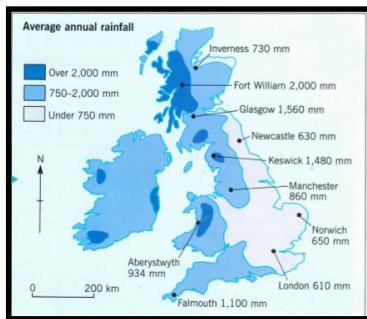
Warm air rises, this is known as low pressure and brings clouds and rain. Where as cold air sinks creating high pressure and clear conditions – although whether it is hot or cold depends on the season! We show air pressure in isobars on a map.



What is the climate of the UK?

The day to day weather of the UK is changeable, however the average weather conditions recorded over the last 30 years tell us that the UK has overall a wet and mild climate. However there are geographical differences, for example the west is wetter than the east and the south is warmer than the north.

Climate data for places are presented in climate graphs which shows temperature and rainfall.



Why is the UK climate so varied?

The main cause of the UK's varied climate is prevailing wind and relief. The prevailing wind in the UK blows from the South West. These bring the polar maritime air mass to the UK. However the reason this air mass brings so much rain to the west is due to how rainfall is created. Locally places with a higher altitude will be cooler.



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 climate like around the world?

There are 4 main types of climate zones around the earth. Whilst the day to day weather they experience will depend on their relief, prevailing wind, air masses and air pressure, the sun (insolation) and latitude are the main process that drives the earths climate zones.

Nearer the equator there is more direct sunlight so we see warmer tropical climate zones, whereas closer to the poles there is less direct sunlight so they are cooler.

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.

Troposphere – the lowest layer of the atmosphere.

Microclimate— the climate of a very small or restricted area

Air Pressure—The force or weight of the air above us.

Altitude – the height of a point above sea level.

Insolation – the solar rays that heat up earth.

Y7 Key Words for this topic – temperature, biome, precipitation and the water cycle.