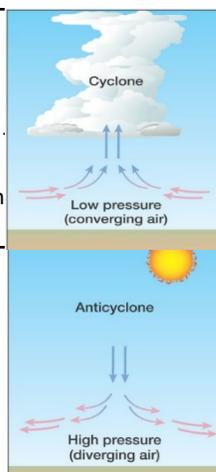


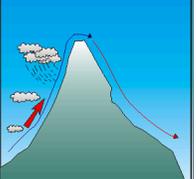
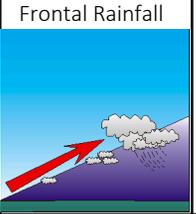
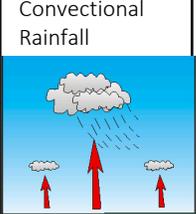
KS3 Geography Knowledge: Weather and Climate

Weather	The state of the atmosphere at a particular place and time
Climate	The state of the atmosphere over a long period of time (<i>typically the average conditions over a 30 yr period</i>)
Temperature <i>It is measured using....</i> <i>Unit...</i>	How hot or cold it is. <i>A thermometer. The liquid inside the thermometer expands and contracts depending on its temperature.</i> <i>Degree centigrade (°C).</i>
Air pressure <i>It is measured using....</i> <i>Unit...</i>	It measures how heavy the air is – how closely packed the air molecules are. <i>A barometer.</i> <i>Millibars. The world's air pressure ranges from 970 to 1040mb.</i>
Wind speed <i>It is measured using....</i> <i>Unit...</i>	How fast the wind is blowing. <i>An anemometer. Cups on the anemometer spin in the wind. The number of rotations are counted to work out wind speed.</i> <i>It is measured using knots or mph.</i>
Wind direction <i>It is measured using....</i> <i>Unit...</i>	Wind direction refers to the direction that the wind is blowing. <i>A wind vane. A wind vane spins and faces the main direction that the wind is travelling in.</i> <i>It is measured using compass directions.</i>
Precipitation <i>It is measured using....</i> <i>Unit...</i>	Precipitation is the amount of rain that falls. <i>A rain gauge. A rain gauge catches precipitation over a period of time.</i> <i>Measured in millimetres per day/month/year.</i>
Cloud cover <i>It is measured using....</i> <i>Unit...</i>	Cloud cover means how much of the sky is hidden by cloud. <i>It is measured using in eighths or oktas. You determine this by looking at the sky and using the above chart.</i> <i>Oktas or eighths.</i>
Air Pressure	Air pressures refers to the density of air molecules within the atmosphere.

LOW PRESSURE is caused when...	Warm air rises. When the air rises, there are less molecules in the lower atmosphere = low pressure.
Common weather is...	Clouds, rain and winds. As the warm air rises, it cools and condenses and forms clouds. Eventually the clouds become saturated (full of water) & rain. Strong winds are common.
Where does it occur?	The equator - the sun's energy is concentrated over a smaller area. The average temperature is 26°C. The warm air rises, cools, condenses to form clouds = precipitation There is a lot of rain at the equator. This is where you find tropical rainforests.

HIGH PRESSURE is caused when...	Cooler air sinks. When air sinks, there are more molecules in the lower atmosphere = high pressure.
Common weather is...	Sinking air = no water vapour condenses = clear skies, dry conditions <ul style="list-style-type: none"> ➢ Summer: hot days, no clouds, dry, droughts. ➢ Winter: cold days, frost and ice common.
Where does it occur?	Air sinks at 30° N&S of the equator and at 90° N&S of the equator. This is where we find hot and cold deserts.



TYPES OF RAINFALL/PRECIPITATION	
Relief Rainfall 	When wind meets a hill meets a hill or mountain, it must rise over it. As the warm air rises, it cools, condenses to form clouds. The clouds become saturated (full of water) and rain occurs. In the UK the prevailing wind comes from the south west (over the Atlantic Ocean). There are many mountains on the west coast of the UK (Wales). As the moist air hits the UK it rises up over the mountains = rainfall.
Frontal Rainfall 	Where a warm air mass meets a cold air mass, the warm air mass rises over the cold air mass. As the warm air rises, it cools, condenses to form clouds. The clouds become saturated (full of water) and rain occurs. Front rainfall is the most common type of rainfall in the UK.
Convective Rainfall 	The sun heats the ground, which then warms the air above it. As the warm air rises, it cools, condenses to form clouds. The clouds become saturated (full of water) and rain occurs. In the UK we get convective rainfall in the south east and inland, where the ground gets hottest.

Weather forecasts:

Meteorology is the scientific study of the atmosphere. Most countries have a central organisation responsible for weather forecasting. Data is collected over millions of weather stations. They use a variety of methods to collect data, including satellites, aeroplanes, radars, ships and ocean buoys. This data is sent to supercomputers which process the data, which meteorologists then use to create charts and forecasts.

- **In Scotland** there is heavy rain with temperatures between 9-11°C. Winds are from the south. The maximum wind speed is 26 mph.
- **In England** there is cloud in the north and sunshine in the southeast, with some rain in the southwest. Temperatures range between 6-9°C. Wind speeds are as low as 3 mph an from the south east.
- **In Northern Ireland** there is heavy rain and temperatures of 12°C, with 20 mph winds from the south west.
- **In Wales** there is cloud and heavy rain with winds of up to 17 mph from the south.



EFFECTS OF THE TEWKESBURY FLOOD

A river flood is when a river overflows its banks and water spreads across the surrounding land. It is caused due to heavy precipitation. Tewkesbury, a market town in Gloucestershire (south west England), was badly affected by a flood in 2007. Following a very dry April, the summer of 2007 was one of the wettest on record. By the end of June, heavy rainfall overloaded rivers, leading to flooding in some areas in Gloucestershire. However, during July the rains were even heavier. On 20th July, two months' worth of rain fell in 14 hours. This resulted in widespread devastation.

Social impacts	<ul style="list-style-type: none"> • 2 people died • 5000 homes and businesses were flooded = 825 homes were evacuated. • 48 homes were without electricity for 2 days. • 135,000 homes were without drinking water for 2 weeks • Transport lines were destroyed.
Economic impacts	<ul style="list-style-type: none"> • Cost: £50 million • Destruction to transport lines cost £25 million • 5000 homes and businesses were flooded and 7500 businesses were without mains water for 17 days = businesses temporarily closed down = unemployment and lack of earnings.
Environmental impacts	<ul style="list-style-type: none"> • Floodwater destroyed crops and contaminated groundwater. • Habitats were lost.



EFFECTS OF THE MILLENNIUM DROUGHT

Between 2002 and 2009 south-east Australia experienced its worst drought in 125 years. This was known as the Millennium Drought. The dry and hot conditions resulted in desertification. This is when land becomes 'desert like' and too dry to grow crops on.

Social impacts	<ul style="list-style-type: none"> • Families had to sell their farms due to loss of crops & livestock. • The rate of suicides among farmers increased. • Buildings started to crack due to extreme temperatures forcing people to evacuate. • The government imposed hosepipe bans and limited showers to just four minutes. • Water and food bills increased by 20%.
Economic impacts	<ul style="list-style-type: none"> • 40% of the land became desertified = crop yields dropped by 66%. • The lack of food being produced in Australia = they stopped making money from exporting foods and have to spend more money importing food from other countries. • The government spent millions on helping farmers cope with the effects of the drought. • The tourism industry declined as people went to other countries.
Environmental impacts	<ul style="list-style-type: none"> • 40% of the land became desertified. The dry conditions led to dry soils that were vulnerable to soil erosion. • Many livestock (animals) died due to a lack of water and food. • Many habitats were lost due to wildfires and lack of water = a dramatic loss in biodiversity as animal and plant species died.



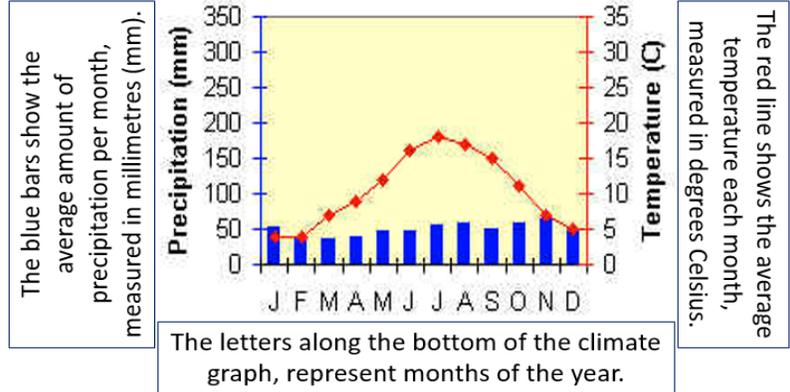
CLIMATE GRAPHS

- Weather is the state of the atmosphere at a given time. The photo shows warm, dry weather in Plymouth, however it might have been raining an hour later.
- Climate is the *average* weather in a place – what the weather is *usually* like. To work it out you collect data over a long period & then calculate average measurements for each month.



Geographers collect climate data to use this to calculate average weather conditions each month (e.g. temperature and precipitation). This data is plotted on a climate graph.

A climate graph shows how precipitation and temperature change throughout the year.



EXPLAINING GLOBAL CLIMATES

Altitude	The higher you are above sea level, the colder it is. The temperature falls by about 1°C every 100 meters. Many areas in the Alps (a mountain range in Europe) are 40°C colder than the coastal areas because they are 4000m high. This also explains why you can find snow on Mt Kilimanjaro which lies on the equator.
Prevailing Wind	Prevailing wind is the most common wind direction. <ul style="list-style-type: none"> • If the prevailing wind direction is over water (sea/ocean), it brings rain. • If the prevailing wind direction is over land, it brings dry air. In the UK, the prevailing wind is from the SW, over the Atlantic Ocean = moist (wet) air which is why we have lots of rain.
Ocean Currents	The temperature of water surrounding a country affects its temperature. <ul style="list-style-type: none"> • If there are warm ocean currents, the temperature will be warm. • If there are cold ocean currents, the temperature will be cold. In Britain we have warm ocean currents, which have travelled across the Atlantic Ocean from the Gulf of Mexico where it is hot. This ocean current is called the North Atlantic Drift and it warms the coast of the UK.
Latitude	Latitude means how far a place is from the equator. <ul style="list-style-type: none"> • Far from the equator (e.g. poles) it is very cold. This is because the earth is curved = many of the sun's rays bounce off the earth's surface. Therefore there is indirect sunlight which shines at a low angle onto a larger area. • At the equator it is very hot. This is because there is direct sunlight which shines directly onto a small area = hot.

