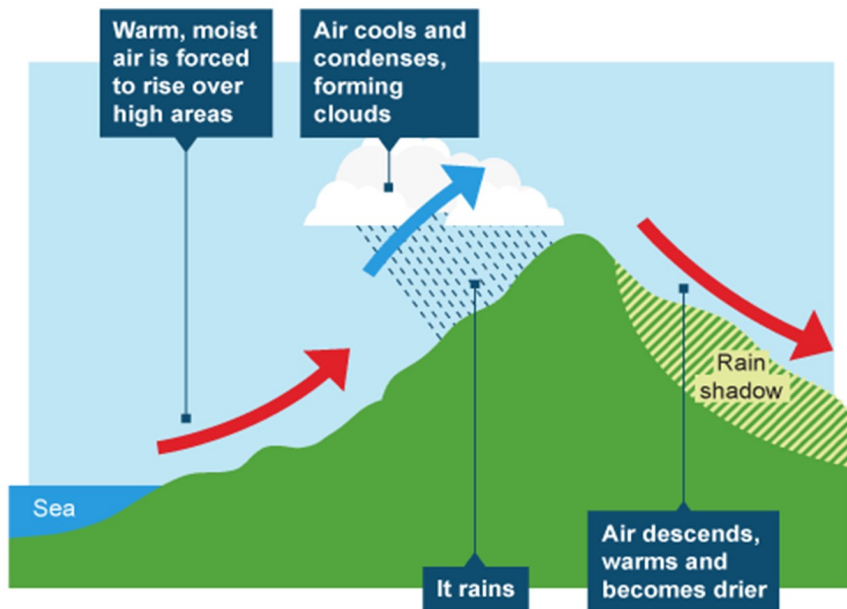
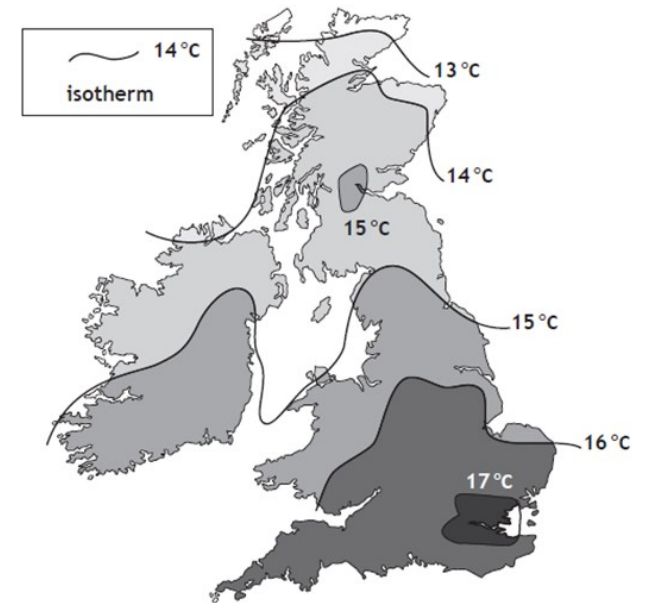




National Geography Knowledge Organiser Physical–Weather

Factors affecting weather in the UK



Weather Factors affecting the UK

Latitude: places in southern England are warmer because they are nearer the Equator (1); temperatures generally decrease the further north you go because the sun's rays are less concentrated further away from the equator (1). It's colder in northern Scotland because there is more atmosphere for the sun's rays to pass through (1)

Altitude/Relief: upland areas are colder as temperatures decrease 1°C for every 100 metres gained in height (1) and wind speeds increase as altitude increases which can affect temperature (1).

Aspect: in the northern hemisphere south facing slopes can be warmer because they face the sun (1). North facing slopes are shaded from the sun and are therefore cooler (1).

Continentality/Distance from the sea: places closer to the sea have warmer/milder winters and cooler summers because oceans heat up slowly in summer and cool slowly in winter (1) oceans act as 'thermal reservoirs' (1) whereas places further inland have a greater annual range in temperature due to distance from the effects of the oceans (1). The North Atlantic Drift keeps the temperatures warmer on the west coast than on the east coast of the UK (1)

Explain why there's difference in the UK

South-East England is usually warmer because it is closer to the Equator (1). This is due to intense heating from the sun (1) because sun rays are more concentrated (1). Places in Northern Scotland eg Wick, are colder because they are closer to the North Pole(1). This is due to a lack of insolation from

the sun as the rays are less concentrated (1) and reflection of heat by the snow and ice (1). Places located on flat low-lying land are warmer eg Central Scotland, because temperatures increase as altitude decreases and places higher up ie mountainous regions are colder (1) because temperature decreases by 10C for every one hundred metres in height (1).

Places which are south facing are warmer because they get more sun (1) and places which are north facing are colder because they experience cold northerly winds (1). Western coastal areas are warmer because of a warm ocean current (1) (The North Atlantic Drift) and due to the prevailing

South-Westerly winds that are warmed as they pass across this warm ocean current (1). In summer, places closer to the sea are cooler and in winter they are warmer because the sea heats up slowly in summer and cools slowly in winter (2).

What are Air Masses?

1. Large volumes of air with uniform temperature and humidity (e.g. wet and warm, or cold and dry)
2. Air remains stationary over the same place for several days - picks up the properties from that area
3. **Source region** - where air masses move away from the place they were formed
4. What the air flows over influences the type of weather it creates

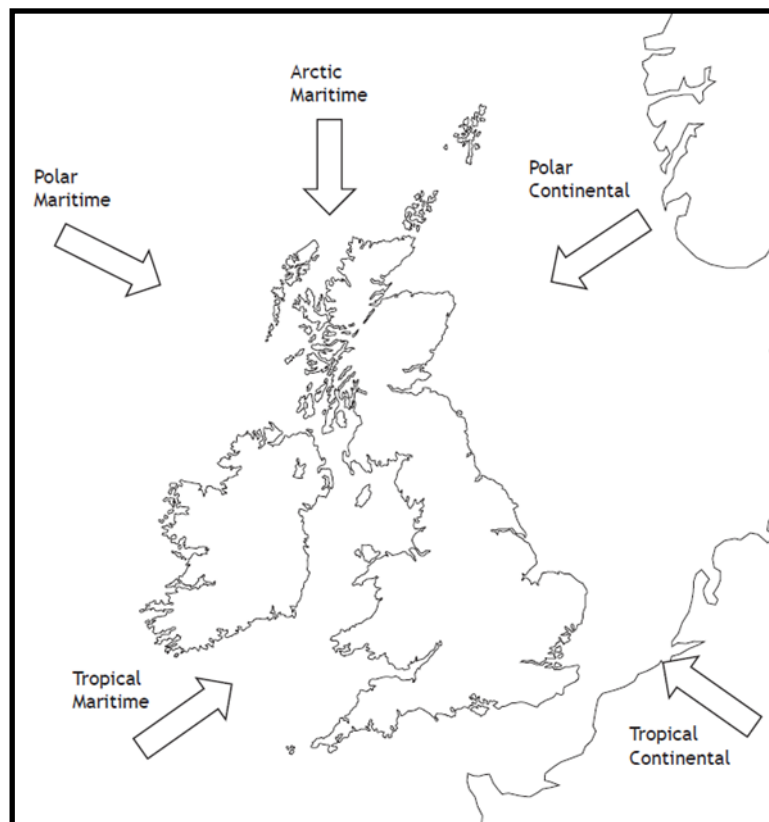
Temperature

- Cold from the North (P)
- Warm from the South (T)
- Freezing Weather (A)

Humidity (amount of water vapour in air)-

- Absorbing water from the oceans = Maritime (m)
- Pass over land and are mainly dry = Continental (c)

Air Masses



Polar Maritime

- Comes from the North Atlantic Ocean
- Brings cool, wet and dull weather
- Often brings strong winds
- Usually westerly and north-westerly winds
- Our most common air mass

Tropical Maritime

- Comes from the Atlantic ocean
- Brings warm and wet weather
- Brings mild and wet weather in winter
- Usually south-west winds
- Quite strong winds
- Found in warm sector of depression

Tropical Continental

- Comes from Sahara desert
- **Hot and dry weather in summer**
- Out least common air mass
- Only affects the UK in summer
- Brings heatwaves and droughts
- Found in anticyclones
- Usually light breeze

Example of Advantage/Disadvantage Question

A tropical continental air mass will bring hot dry weather in summer which could result in droughts (1); there might need to be hosepipe bans (1); grass might wither and die causing problems for livestock farmers (1); ice cream sales might rise (1) as people make the most of the sunny weather and head for the beach (1); it could be very hot and difficult to do physical work outside (1); heavy rain from thunderstorms might cause flash floods (1).

Arctic Maritime

- Comes from Norway and Greenland
- **Brings very cold, wet weather**
- Brings **snow** in winter, showers in summer
- Often brings biting winds

Polar Continental

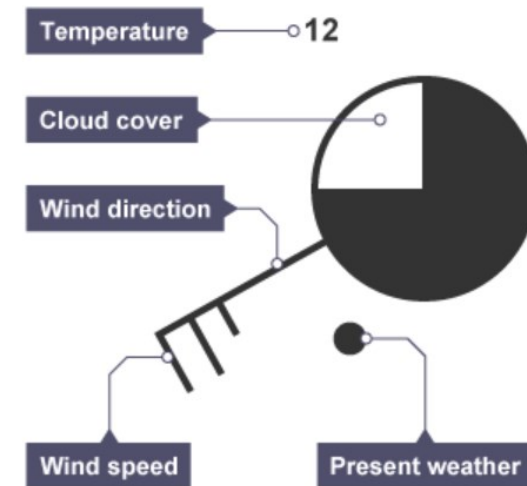
- Comes from Siberia
- **Brings very cold, dry weather in winter**
- **Brings warm, dry weather in summer**
- Fog is common
- Very little wind
- Associated with anticyclones

Weather Station Plots

You must be able to read and draw station plots.

You must remember the information in the table below.

You may be asked to read a synoptic chart and determine the weather condition from a station plot.



Symbol	Precipitation	Symbol	Cloud Cover	Symbol	Wind speed	Symbol	Wind direction	Symbol	Temperature
	Drizzle		Clear sky		Calm		North	1	1 degrees Celsius
	Rain		One <u>Okta</u>		1-2 Knots		East	15	15 degrees Celsius
	Heavy Rain		Two <u>Okta</u>		5 Knots		South	The number written represents the temperature.	
	Snow		Three <u>Okta</u>		10 Knots		West		
	Mist		Four <u>Okta</u>		15 Knots		South East		
	Fog		Five <u>Okta</u>		20 Knots	Wind direction is always read by the direction the wind is coming from.			
	Thunderstorm		Six <u>Okta</u>		50 Knots or more				
	Sleet		Seven <u>Okta</u>						
	Hail		Eight <u>Okta</u>						
	Snow Shower		Sky Obscured						





Anti-cyclones (**high pressure systems**) also impact the UK - they occur when air is sinking creating calm conditions.

- Isobars are far apart so calm wind conditions
- No front so little or no precipitation or cloud cover
- Wind travel clockwise
- High pressure causing settled conditions

Anticyclones in Summer

- Dry because of sinking air
- Light winds and calm, isobars are widely spaced
- Sunny, few clouds because the air is sinking
- Hot during the day because there are few clouds
- Cool at night because there are few clouds.
- Early morning dew
- Occasional thunderstorms
- Coastal mist

Anticyclones in Winter

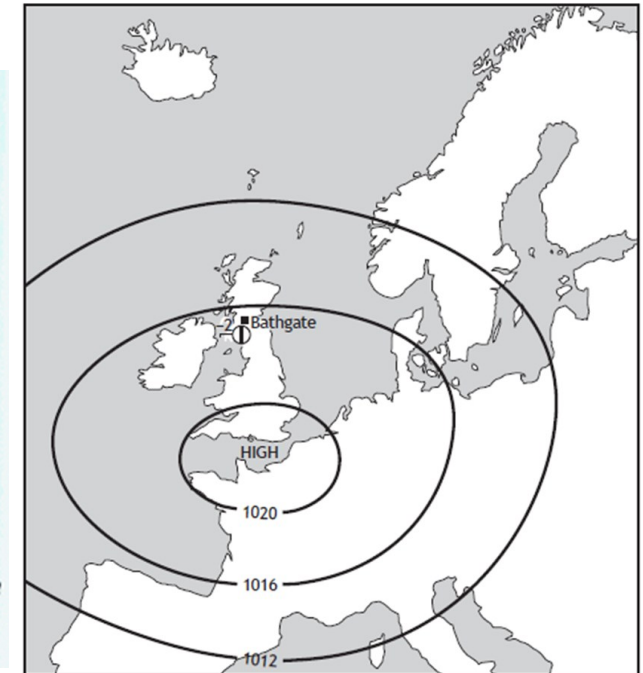
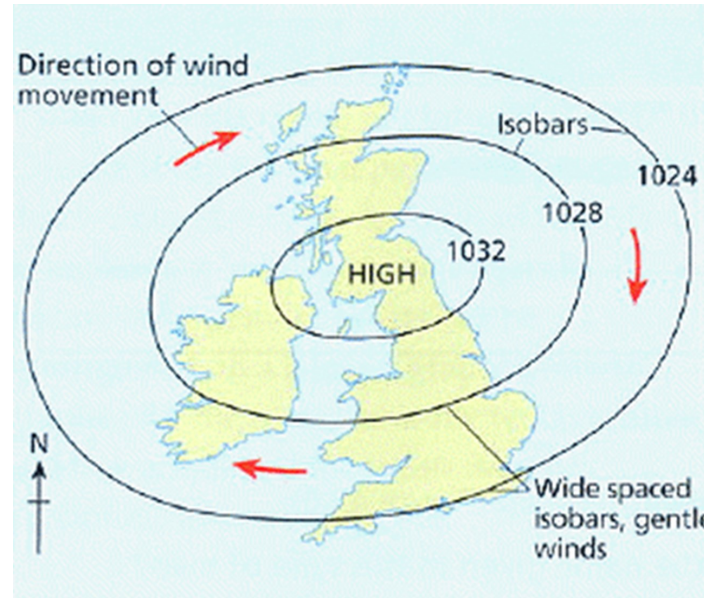
- Dry because air is sinking
- Light winds or calm, isobars are widely spaced.
- Sunny, few clouds because the air is sinking
- Cold during the day
- Frost at night because there are few clouds
- Early morning fog, especially on low ground.

Anti-Cyclones Higher Pressure Systems

How do I know if it is summer or winter?



Diagram Q3: Synoptic chart for 12.00 on 28th December 2014



Similarities and Differences Between Summer and Winter

Similarities

In both summer and winter, wind speeds are light or calm towards the centre of the anticyclone (1); in both summer and winter winds circulate in a clockwise direction (1); there are few clouds in the sky at both times of year (1); anticyclones bring a spell of settled weather in both summer and winter (1); there may be mist in the morning at

both times of year (1).

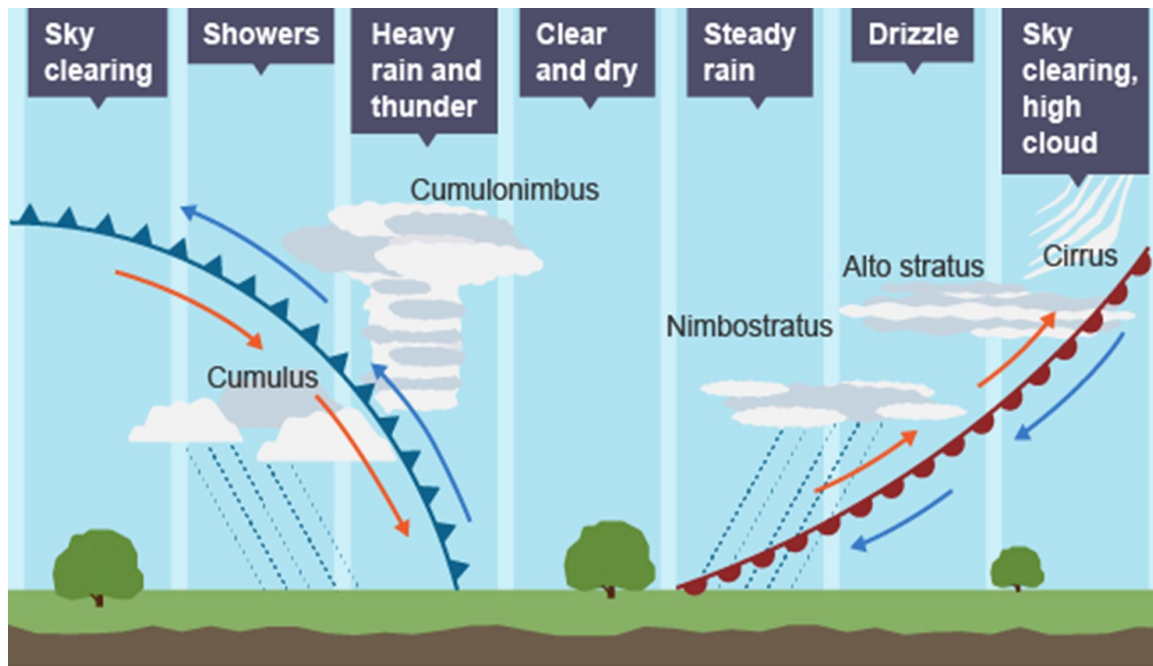
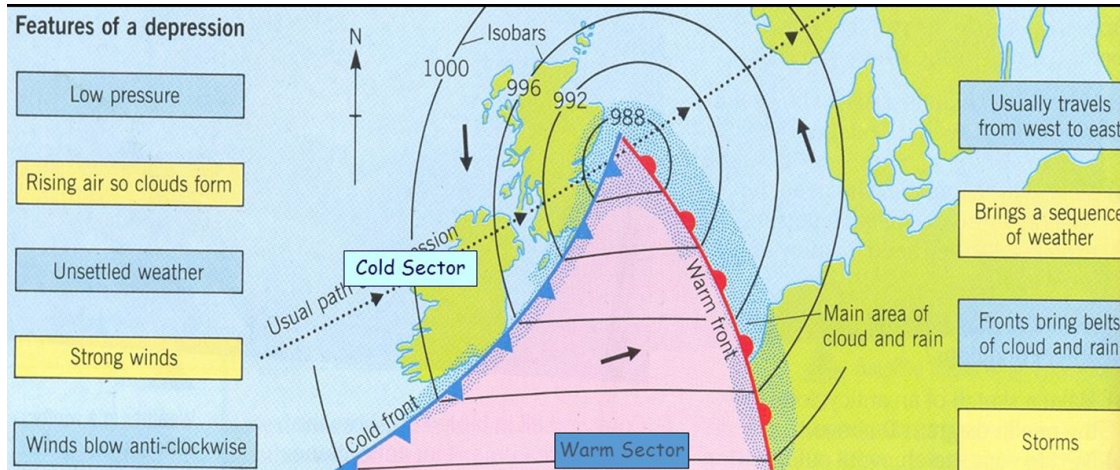
Differences

Anticyclones bring hot weather in summer but very cold weather in winter (1); heat waves can occur in summer if an anticyclone remains over the UK for a period of time (1); however during winter severe frosts are common at night and during the day (1); cooling of the ground leads to morning mist in summer, but in winter fog lasting part/all of the day is common (1); warm moist air rising from the ground can form thunderstorms in summer (1).

Depressions

Depressions (low pressure system) form when a cold air mass meets a warm air mass.

The junction between these two different air masses is called a front. A front is associated with a change in the weather.



West East

Cool air Warm air



Warm front

Warm Front

A warm front means that warm air is coming.

In a low pressure system the warm front is the first to pass over. This occurs when warm air meets cold air and the warm air rises above it. Warm fronts bring steady continuous rain.



Cold front

Cold Front

A cold front means that cold air is coming.

The next front to pass over is the cold front. This occurs when cold air meets warm air. The cold air pushes under the warm air forcing it upward. Cold fronts bring heavy rain showers and strong winds.



Occluded front

Occluded Front

When the cold front catches up with the warm front the result is an occluded front. Occluded fronts bring sudden downpours of heavy rain.

What happens as a depression passes?

Due to the approach of the warm front, the air pressure will fall (1) cloud cover will increase (1) and steady rain will fall (1). Winds will be stronger as the isobars are closer together (1). Because it will be in the warm sector of a depression, temperatures will rise (1) and it will be mild with some cloud cover and occasional showers (1).

Due to the cold front arriving, cloud cover will increase (1) with cumulonimbus clouds bringing heavy rainfall (1). Temperatures will drop as the cold front passes over (1). As the front begins to move away, the sky will become clear (1) rain will stop (1) air pressure will begin to rise (1).