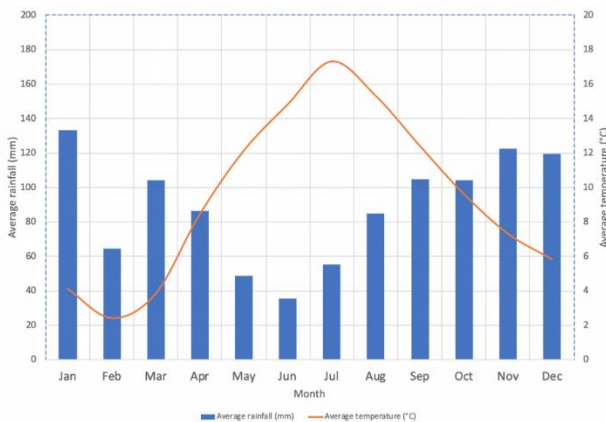


Year 7 Geography

Name:

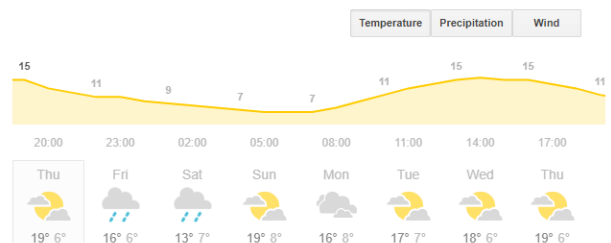


The Weather and Climate



 15°C | °F

Precipitation: 0%
Humidity: 49%
Wind: 10 mph



Brooke Weston
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Geography
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Useful websites

- BBC Bitesize: <https://www.bbc.co.uk/bitesize>
- Cool Geography: <http://www.coolgeography.co.uk/>
- National Geographic: <https://www.natgeokids.com/uk/category/kids-club/>

Part 1: The Weather and Climate

What is the difference between weather and climate?

What factors affect the climate?

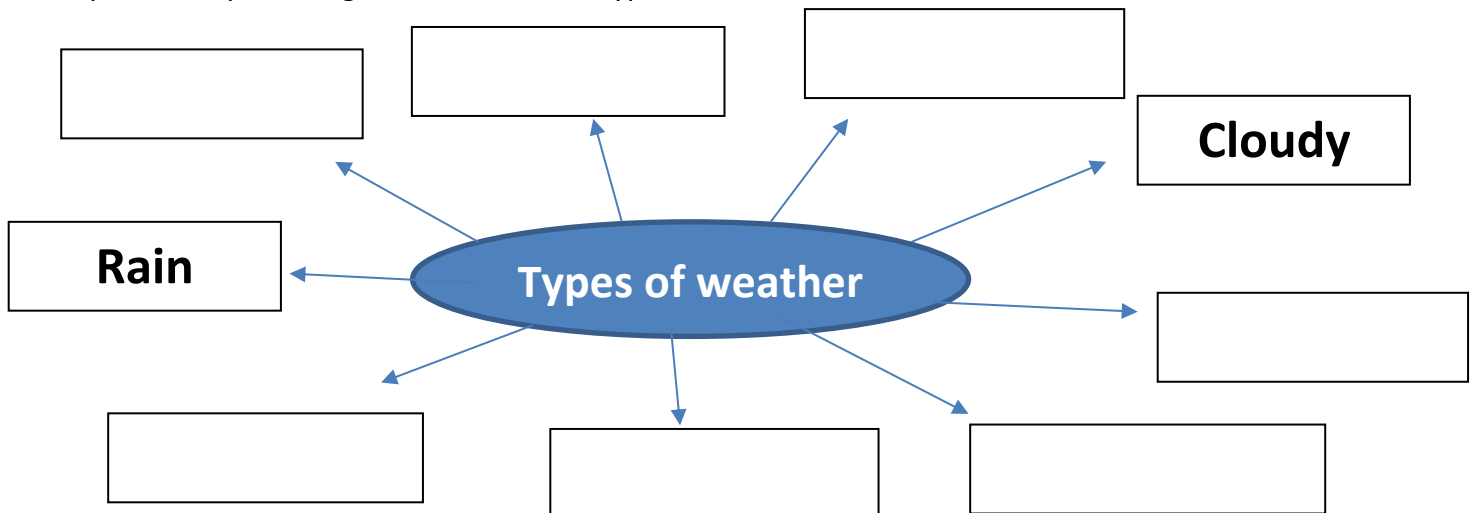
Weather can affect us in many ways. Meteorologists study weather patterns to predict upcoming changes and hazardous conditions such as storms. The first thing to try and understand is the difference between weather and climate. The two are linked – but actually very different.

Weather describes the day-to-day conditions of the atmosphere. Weather can change quickly - one day it can be dry and sunny and the next day it may rain.

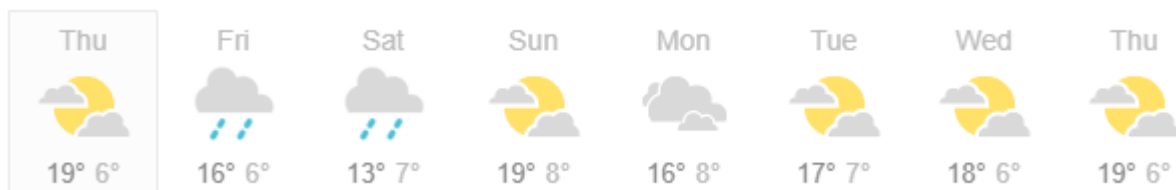
Climate describes the average (most common) weather over longer periods of time and refers to large areas. It can be broken down into months, seasons, or a general statement of a year – for example the UK has a wet and cold climate during the winter.

TASK

Complete the spider diagram with different types of weather.



Write a description of the weather today in the box below. Use the image below to help you.



Write a description of the UK climate in the box below i.e. what is the weather usually like in the UK?

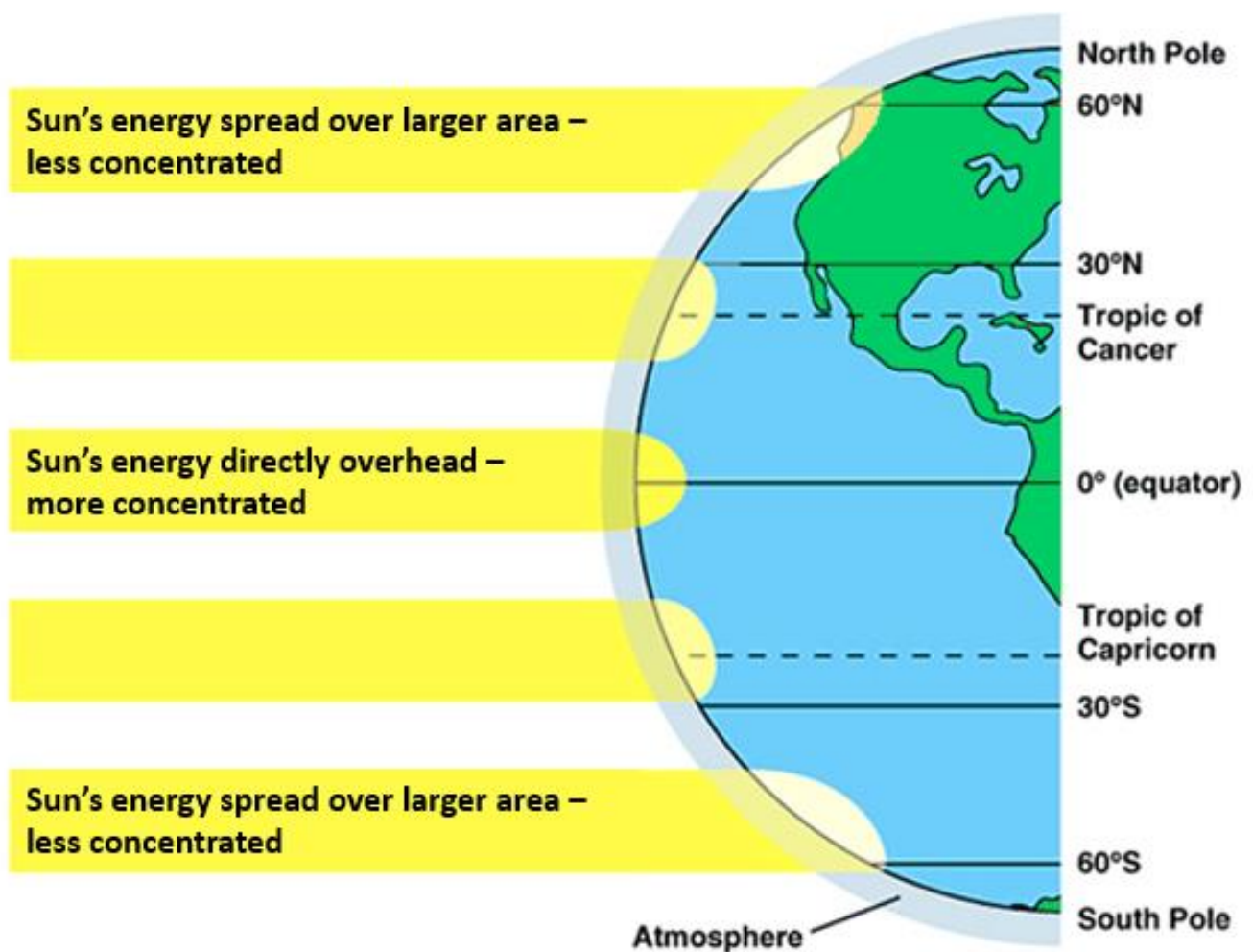
What factors affects the climate?

There are several factors that affect the climate. Two factors are...

- Latitude
- Prevailing wind direction i.e. the direction where the wind usually comes from.

Latitude

Energy from the sun heats the Earth, but not everywhere receives the same concentration / amount of sunshine as the diagram below shows. Where the sunlight hits the **Equator**, the sunlight is concentrated on a relatively **small area** – making that area much warmer. But when the sunlight hits the Earth where it is curved, closer to the **North and South Pole**, the sunlight is spread over a **wider area** meaning it doesn't get as hot so **much colder**.



Prevailing wind

Prevailing wind refers to the direction where the wind most commonly comes from e.g. in the UK we have a south-west prevailing wind. Although this doesn't mean that the wind always comes from the same direction. The direction the wind comes from can affect the weather and climate. If the wind comes from the **south** it will bring **warmer weather**, from the **north** it will bring **colder weather**, across the **seas and oceans** will bring **wet weather** and **across land** will bring **dry weather**.

TASK

Complete the boxes to **describe** what weather the wind will bring, will it be warmer or colder, drier or wetter? Try to add an **explanation** as to why the wind will bring that weather.

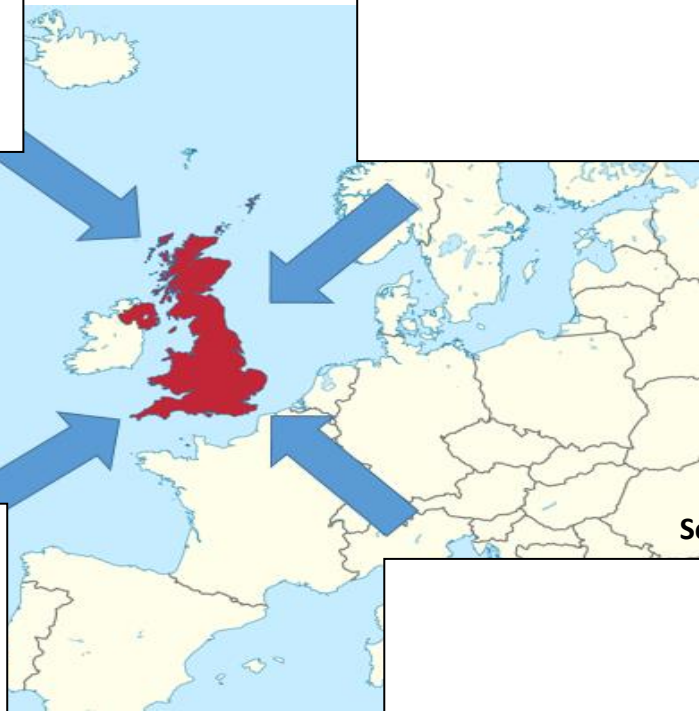
Prevailing wind and the UK climate

North-west wind

North-east wind

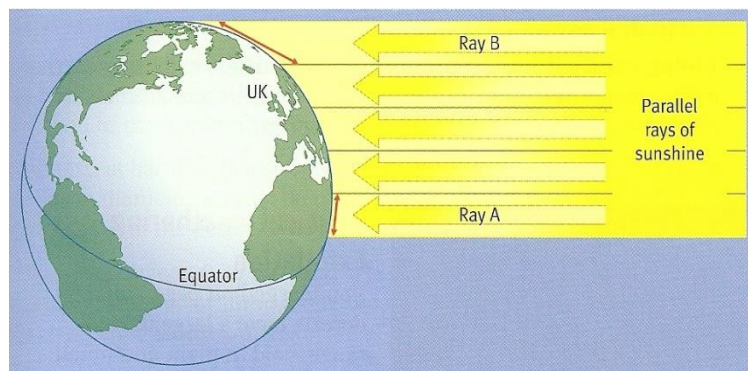
South-west wind

South-east wind



TASK

Using the diagram, **explain** why the climate in the UK is colder than countries that are located on the Equator such as Kenya.



Part 2: Measuring the Weather

What can we use to measure different aspects of the weather?

Weather affects us in many ways. It affects what we do and what we wear, how we travel and even our moods. Meteorologists measure weather conditions in different places and use this information to report and make forecasts about future weather conditions. This is useful because people can be warned about hazardous weather conditions such as storms and floods.

What do we measure?

- Temperature
- Precipitation, eg rainfall
- Wind speed and direction
- Cloud cover and visibility
- Air pressure
- Humidity (amount of water vapour in the air)
- Sunshine



Temperature is measured in Celsius (°C) using a **thermometer**. The thermometer must be shaded from direct sunlight and should have air circulating around it.

Precipitation (rain, snow, hail etc) is measured using a **rain gauge**. This is a funnel inside a container. The depth of the rain is measured in millimetres and can be read from the side of the container.

Wind direction is reported by the direction it is blowing from, according to the compass. Wind blowing from the west is travelling eastwards so is called a westerly wind, not an easterly wind. Wind direction can be determined by using a **weather/wind vane**.

Wind speed can be measured using an **anemometer**. The strength of the wind is measured in mph, kph or on the Beaufort scale.

Cloud cover is measured in units called **oktas**. Each okta represents one eighth of the sky covered by cloud.

Air pressure. Air is light but because there is so much of it above us, it exerts a pressure on us. Air pressure is measured by a **barometer**. The units used are millibars. The greater the reading, the higher the pressure.

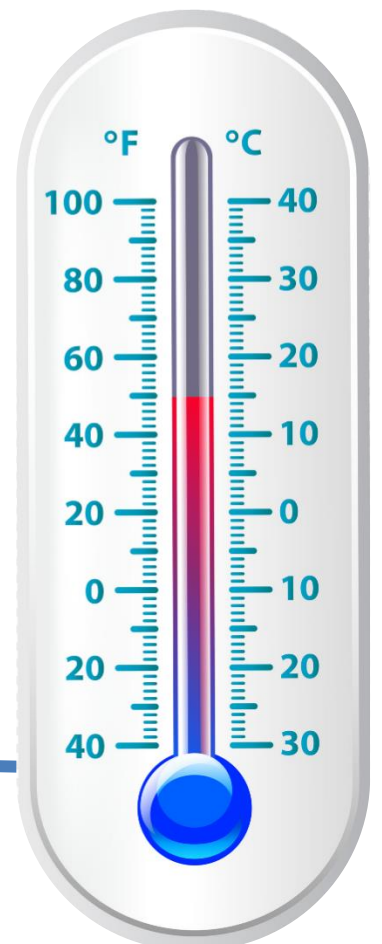
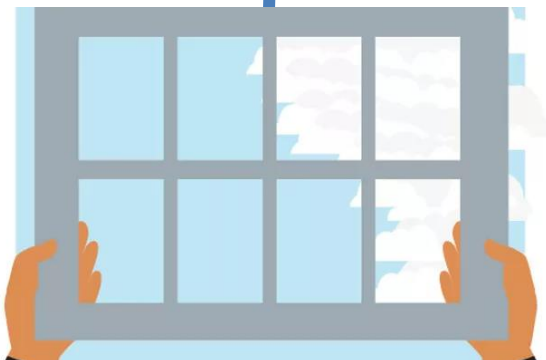
A **high-pressure** system is called an anticyclone. Air falls in an anticyclone so no clouds are formed. In summer, high pressure usually results in clear skies, gentle breezes and fine weather. In winter high pressure leads to clear skies and colder conditions.

An area of **low pressure** is called a depression. Air rises in a depression so clouds and rainfall are formed. Depressions therefore bring unsettled weather and rain. Winds are normally stronger. They usually form over the Atlantic Ocean and are carried across Britain by westerly winds.

Beaufort Wind Scale		
Beaufort Number (Force)	Wind Speed (mph)	Effects observed on land.
0	under 1	 Chimney smoke rises straight up
1	1-3	 Smoke drifts gently
2	4-7	 Leaves rustle, wind felt on face
3	8-12	 Leaves & twigs on trees move
4	13-18	 Dust & paper blow on the ground
5	19-24	 Small trees start to sway

TASK

Look at the images and work out the name of the instrument and what aspect of the weather it is used to measure. One has been completed for you.



Thermometer used to measure the temperature.

Part 3: Clouds and rainfall

How do clouds form and why does it rain?

In Britain it rains – a lot! But not everywhere experiences the same amount of rainfall.

For example on average East Anglia receives around 700mm of rainfall annually, whereas London receives 650mm – which is actually less than Sydney, New York and Rome. Crib Goch in North Wales however, receives lots more – around 4,500mm of rain a year.

Why is it important to understand the cause of rainfall?



TASK

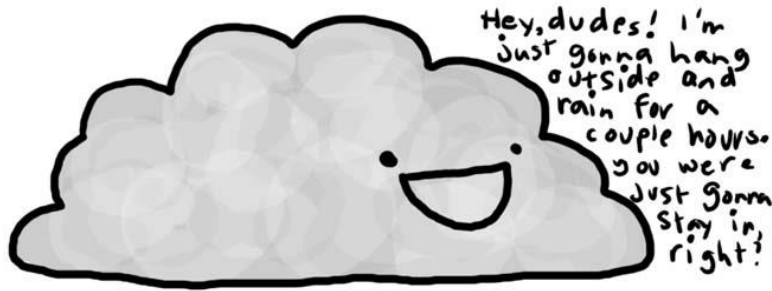
Using the images, think of 5 reasons why it is important to understand the causes and patterns of rainfall, where receives the most and least rainfall.



Reasons you may have come up with could include:

- Heavy rainfall can damage homes and belongings
- In areas where it rains a lot, rain can be stored in reservoirs to provide drinking water.
- Reservoirs also provide opportunities for leisure such as walking, cycling, sailing etc
- Rain is important for the growth of crops, too much or too little can affect food supplies.

What is a cloud?



A cloud is a collection of water droplets in the air.

When these combine together they are known as cloud droplets. A cloud is visible to the human eye because there are lots of these cloud droplets crowded together.

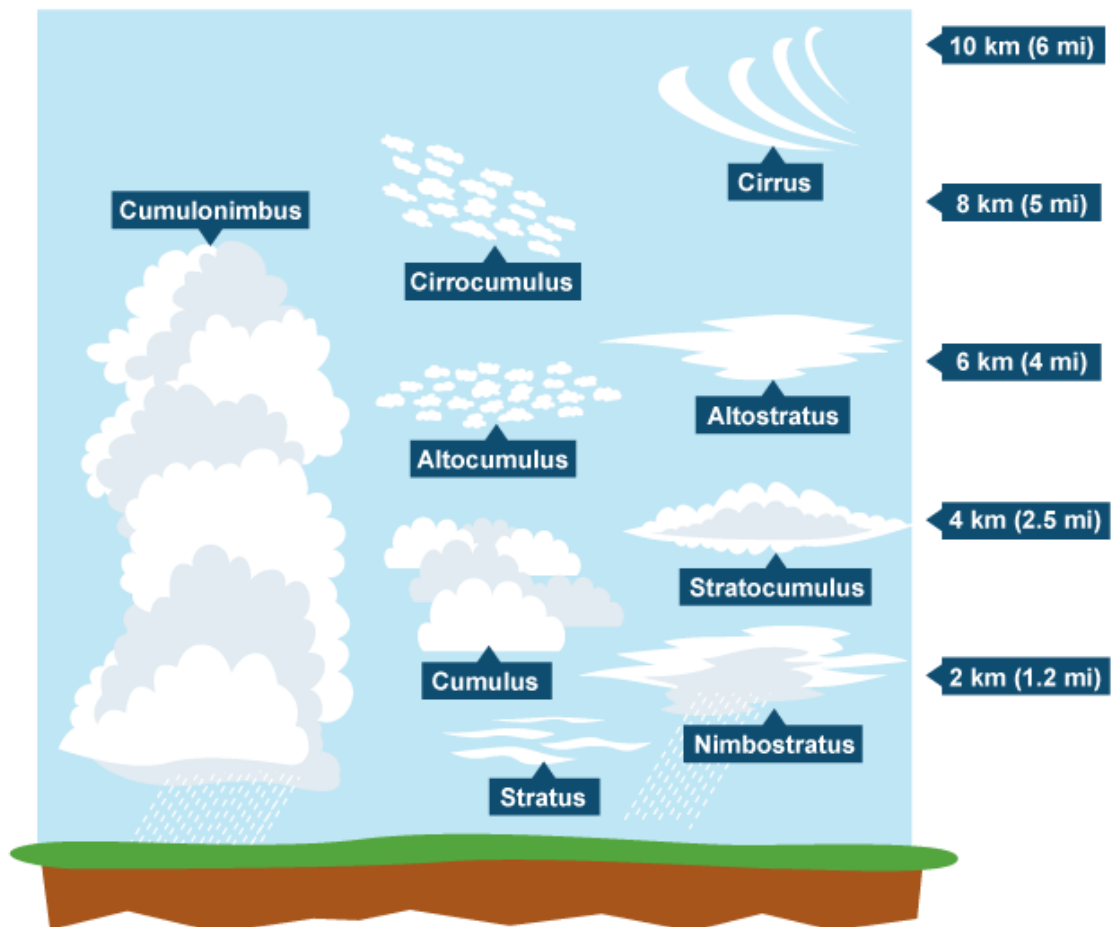
How are clouds formed?

Clouds are formed when water on the ground (in puddles, rivers, lakes, the oceans and seas) is heated up and evaporates (changes from a liquid to a gas).

Warm air, which is able to hold lots of moisture, rises and then cools and condenses (changes from a gas back to a liquid) this is when clouds can be seen.

Cloud types

Clouds are categorised according to height and shape. The different categories of clouds are then given names based on Latin words, eg nimbus clouds bring rain, stratus clouds appear as layers.



Why does it rain?

As more water droplets form they join together and become heavier. When they are too heavy to be suspended in the air (as a cloud) they fall to the ground as rain (or sleet, snow and hail, if temperatures are cold enough) which is known as precipitation.

This whole process is known as the water cycle – because once the precipitation has fallen to the earth it can happen all over again.



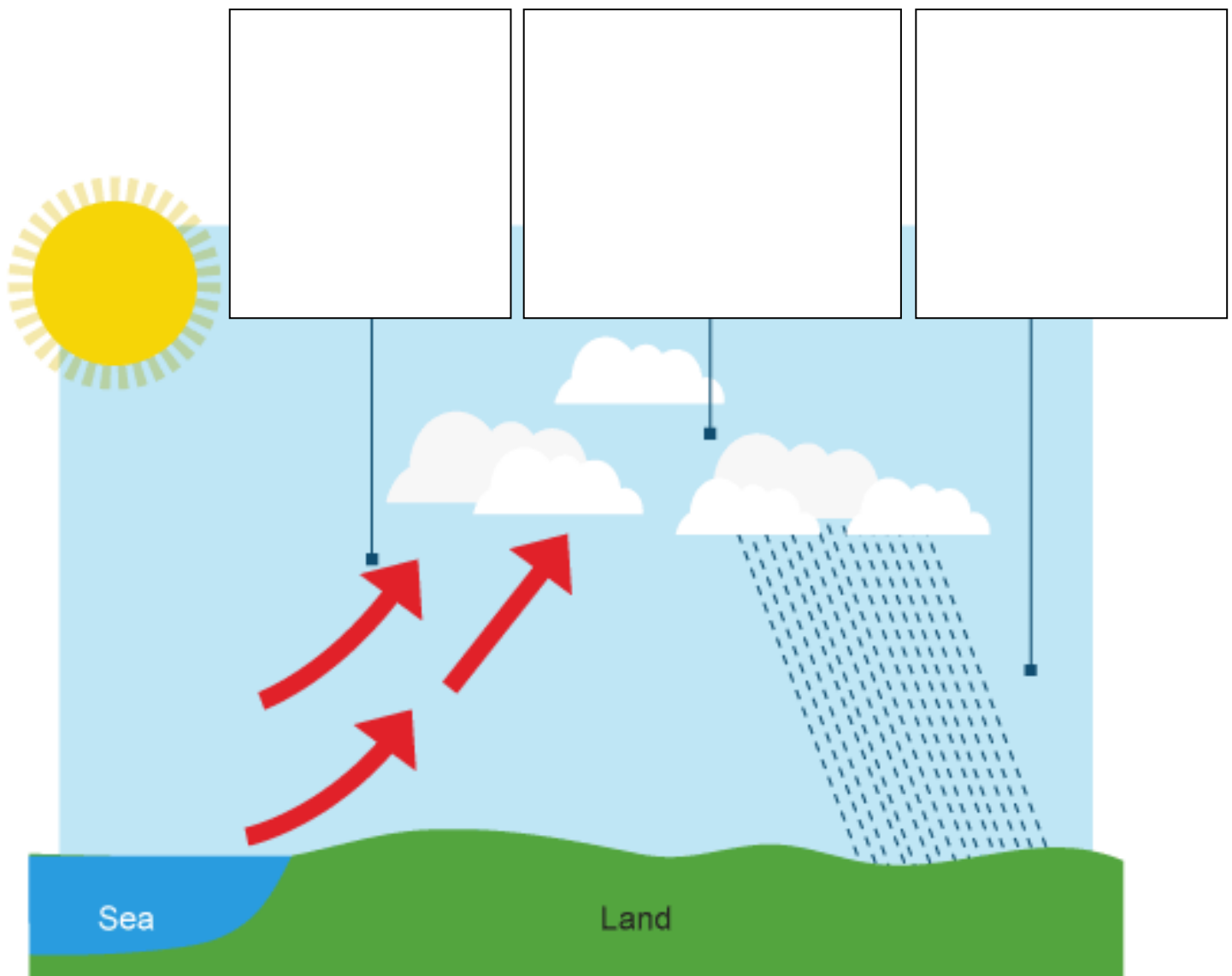
There are three main different types of rainfall but the way in which clouds are formed and why it rains is the same in all three. The three main different types of rainfall are:

- **Convective rainfall**
- **Relief rainfall**
- Frontal rainfall

TASK

Using the information about how clouds form and why it rains, annotate the diagram below to explain how convective rainfall works.

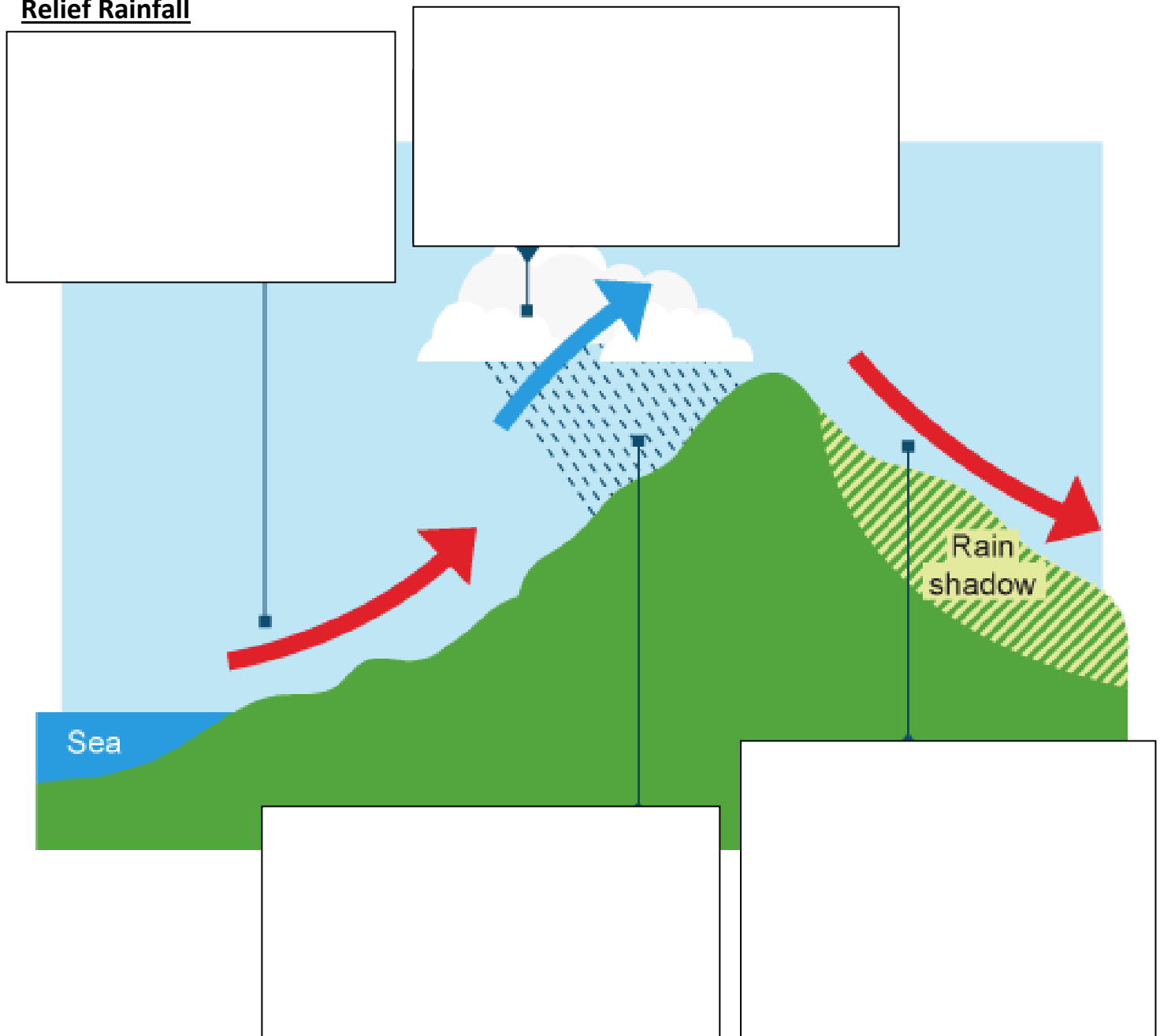
Convective Rainfall



TASK

Using the information about how clouds form and why it rains, annotate the diagram below to explain how relief rainfall works. To help you, the information you need to add is below the diagram but not in the correct order.

Relief Rainfall



1. As the warm air rises, the water vapour (gas) cools and condenses (turns to a liquid), water droplets then form clouds.
2. The air then sinks (descends) on the leeward side of the mountain. The air warms, no clouds form and it doesn't rain. This is known as a rain shadow.
3. As more water droplets form they join together and become heavier. When they are too heavy to be suspended in the air (as a cloud) they fall to the ground as rain which is known as precipitation.
4. The warm air contains lots of moisture which has been evaporated from the ocean. The warm air is forced to rise due to the mountain.

Part 4: Depressions and Anticyclones

How do depressions and anticyclones form?

What type of weather do depressions and anticyclones create?

In the UK there are two main types of weather system that we get – depressions and anticyclones. These bring with them particular types of weather and the three types of rainfall we looked at earlier.

Depressions

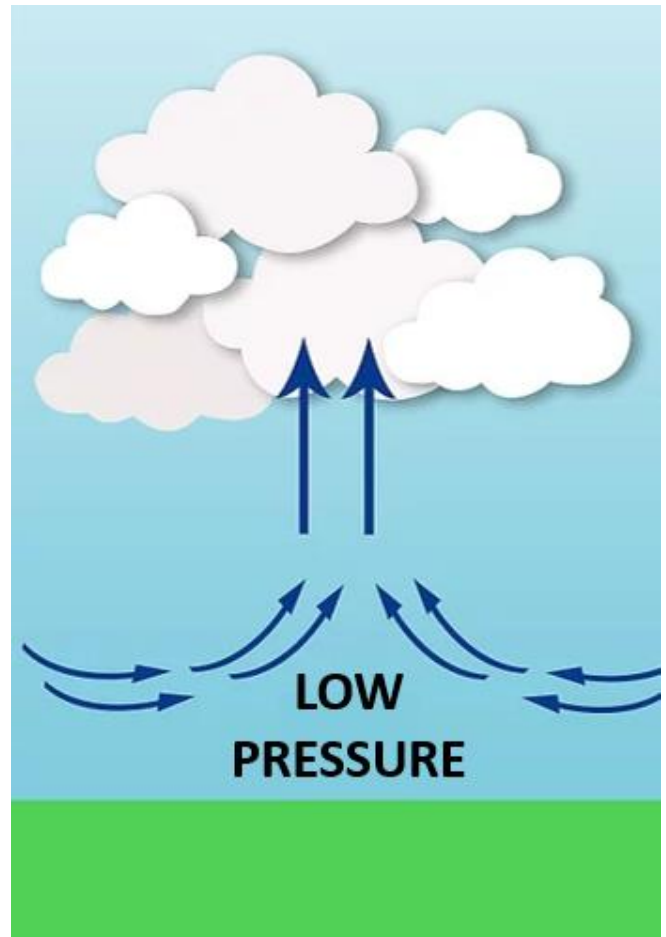
Depressions are areas of low pressure and bring with them rain, cloud and wind.

Pressure is a geographical term used to describe the rising or falling of air towards the ground. In areas of low pressure the air is rising. We'll look at what happens when air is falling in the next section.

This is because air is warmed up by the sun and hot air rises. You should remember that where hot air rises it will eventually cool and condense forming clouds. The diagram should help you remember this.

For the UK, depressions normally form out in the Atlantic Ocean, which are then pushed towards the west coast and then across the country. This is one of the reasons why the south west of England receives larger amounts of rainfall than the north east.

The diagram on the next page shows you what happens in each place at a depression.

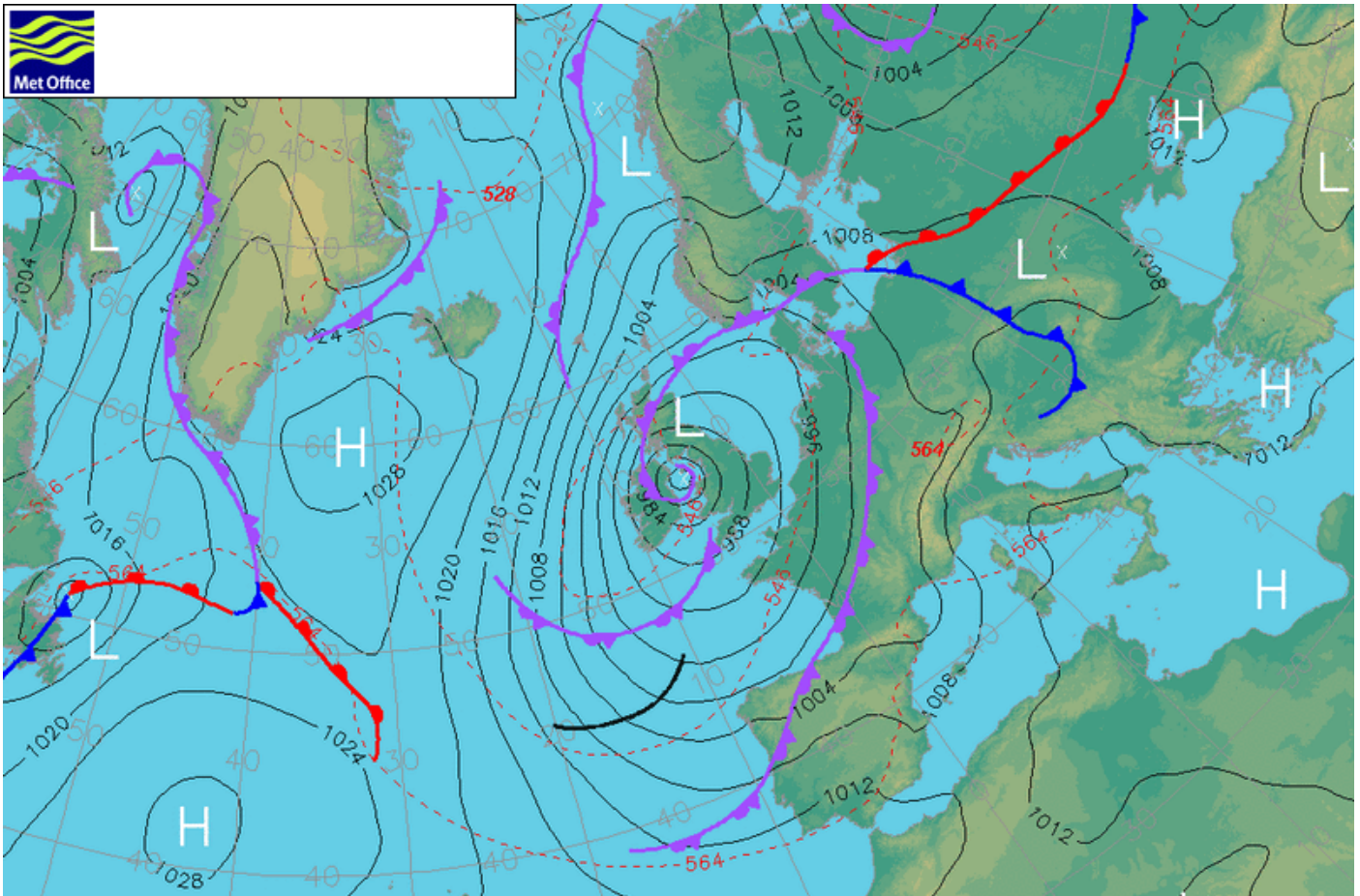


Recognising a Depression



A satellite photograph showing a depression over the UK – difficult to spot when you're on the ground! It's easier to recognise on the weather forecast as shown on the next page!

A synoptic chart is used by weather forecasters to show the different pressure systems.

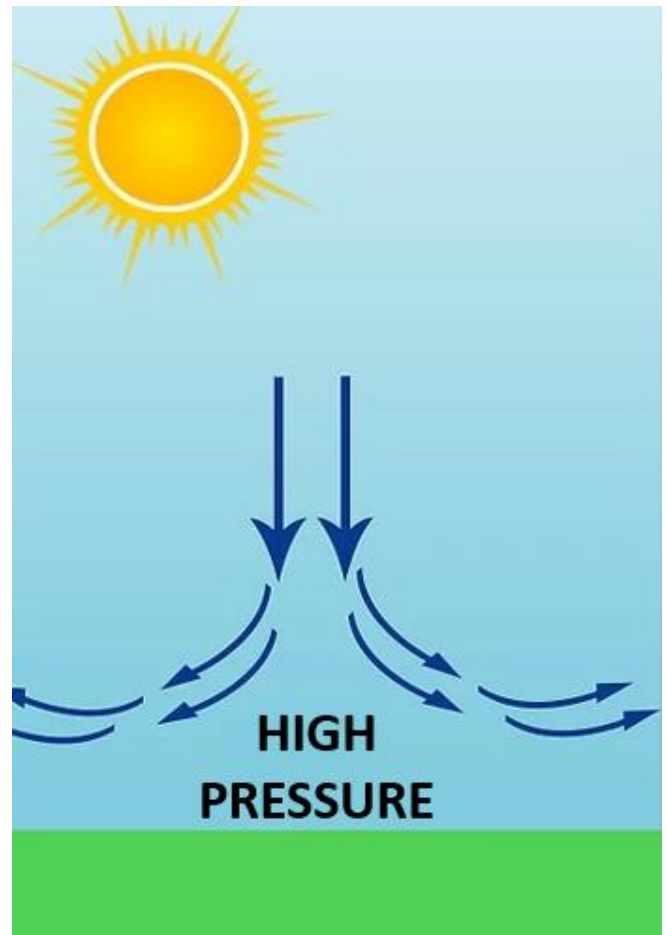


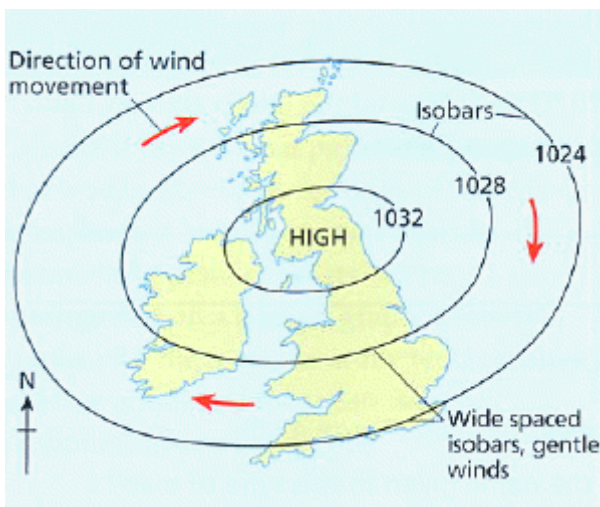
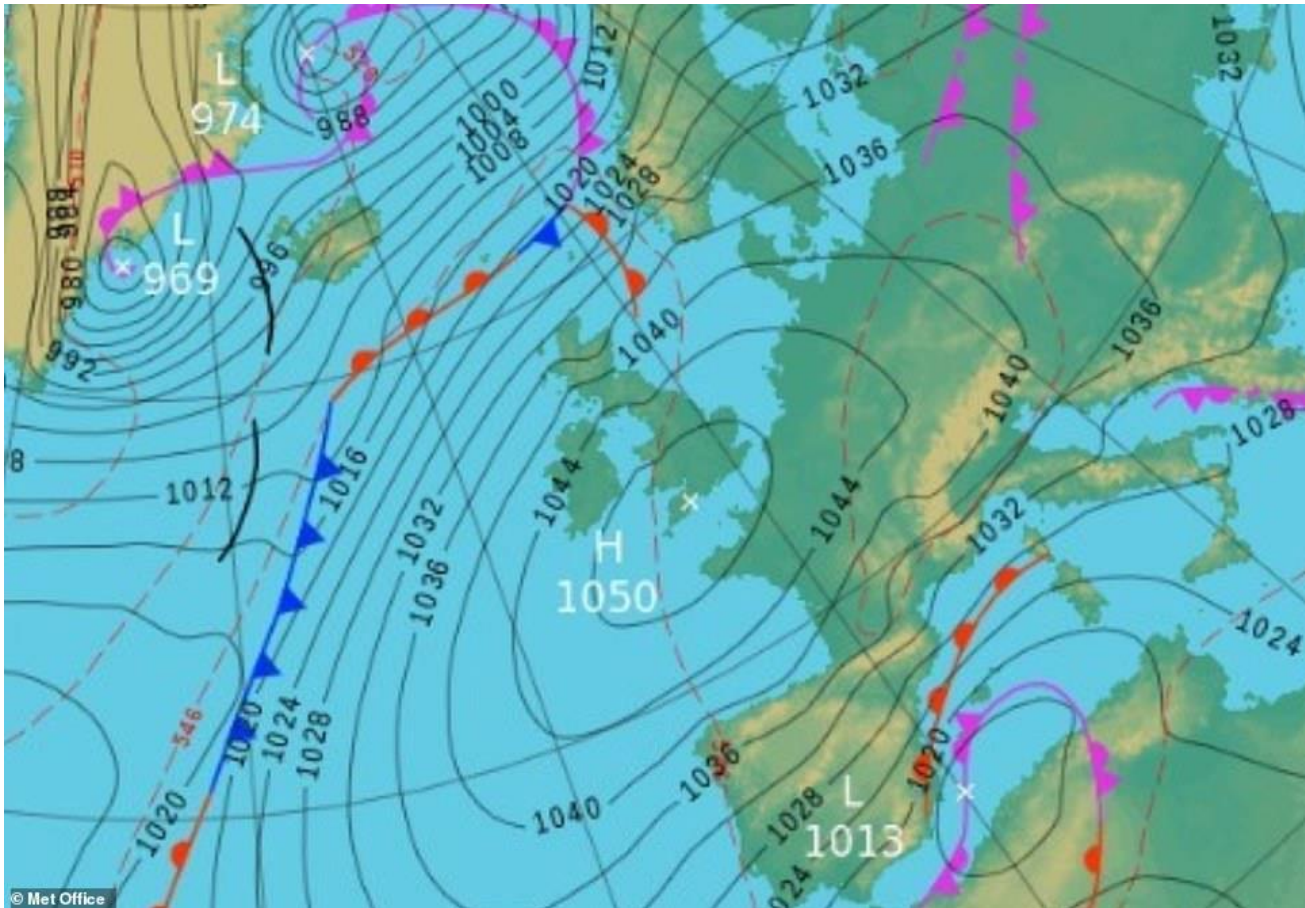
Notice how the numbers on the isobars (the lines connecting areas of equal pressure) get lower towards the centre of the depression showing that this is a depression an area of low pressure. The closer the isobars the windier the weather will be. The wind moves anti-clockwise around the centre of the depression.

Anticyclones

In areas of high pressure the air is falling towards the earth, this is because the air is cold, heavier and sinking back down to earth. This type of weather system is known as an anticyclone.

Anticyclone weather has few clouds. This is because the air is sinking and does not condense to form clouds. They also tend to move much slower than depressions – taking days to move across the country. In summer this brings long periods of hot, sunny weather but in winter it brings clear skies, low temperatures, frost and fog. The weather conditions are the direct opposite of depressions.





The synoptic chart above and to the left shows a high pressure system. The easiest way to tell this is because of the HIGH in the middle that weather forecasters put on their chart. The other way is that the numbers on the isobars get higher towards the centre of the anticyclone.

Task

Fill in the blanks in sentence below using the words below.

Anticyclones are areas of pressure which form when air sinks. They usually cover areas and give periods of fine settled weather which can be hot in and and frosty in .

Winter

Long

Large

High

Cool

Summer

Cold

Task

Complete the table below showing the weather conditions for an anticyclone, in both summer and winter, and for a depression.

	Anticyclones		Depressions
	Summer	Winter	
Temperatures			
Cloud Cover			
Wind Speed			
Wind Direction			
Rain			
Other Features			