

The Weather in the UK

The weather in the UK is influenced by air masses and air streams. The weather is so varied because of the different source areas of the air masses and the fact that air streams do not mix but form fronts when they meet.

An **air mass** is a large volume of air that has remained in an area for a long period of time.

When an air mass starts to move to another area, it is called an **air stream**.

The **Tropical Continental air stream** flows to the UK from a southerly direction. The air flows over land so the weather is hot, dry and sunny in summer and warm, dry and sunny in winter.

The **Tropical Maritime** air stream flows in towards the UK from a westerly direction, it travels to us from the Atlantic Ocean, it comes from over the tropics so the weather it brings is warm, rainy and cloudy in winter.

A **Polar air mass** originates in the high pressure region near the North Pole. It travels from the North West towards the UK. These winds bring cool air in the summer months and cool, rainy conditions in the winter.

A Northerly air stream from the Arctic region brings very cold air in both winter and summer. In summer, it will bring rain and in winter, snow. The air masses from these regions do not change characteristics as they travel. For example, it leaves the Arctic region very cold and arrives in Scotland, still very cold.

*I got smashed with a snowball
and the snow shivered
down my back.*

Data Collection

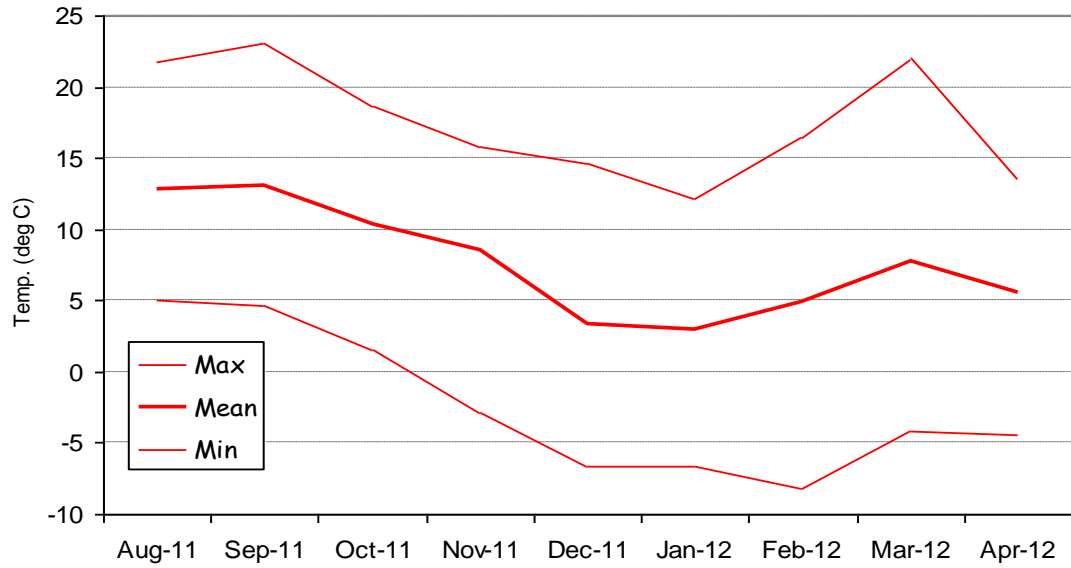
Each pupil in S3 and S4 Geography classes was responsible for collecting weather data for one week, so that data was collected in total for several months. Data was also collected electronically.

The data that was collected was used in S3 Maths classes to support learning about statistical techniques.

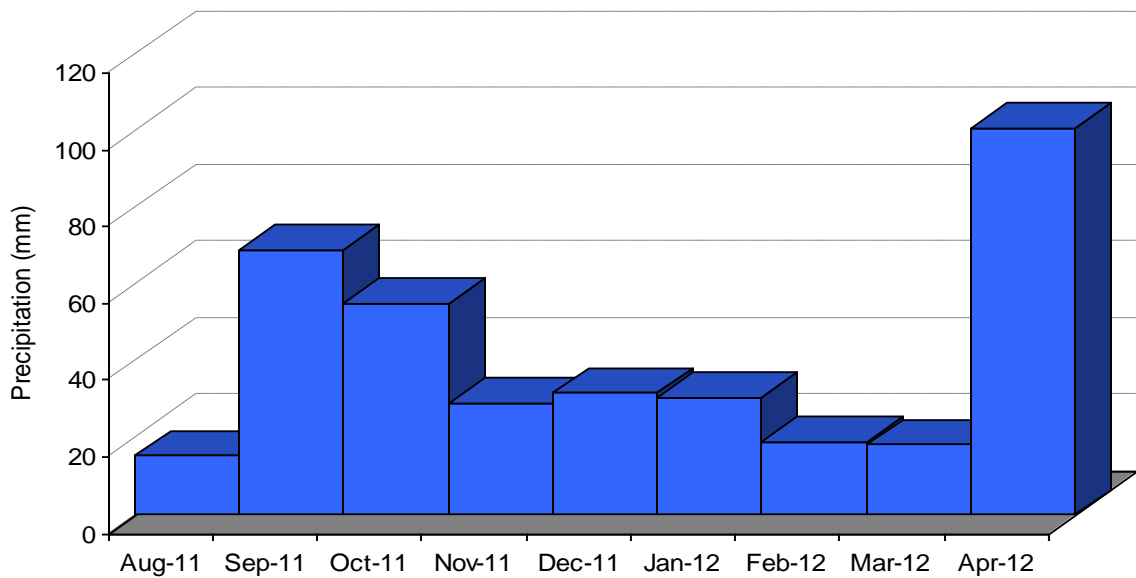
S2 ICT classes used the data to learn how to produce spread sheets and graphs.



MONTHLY TEMPERATURE ABERDEEN



MONTHLY RAINFALL ABERDEEN



S4 Geographers



Weather Patterns in the UK

Although our weather is very varied, during the passage of a depression certain patterns in the weather can be identified:

Stage 1:

Before the warm front arrives, the first sign of the approaching front is the really high clouds; the wind comes from a South Easterly direction and it is very dry.

Stage 2:

In the second stage, as the warm front passes, the clouds thicken and are lower to the ground, the air pressure falls steadily, prolonged rain occurs.

Stage 3:

The warm sector: the rain stops and the sky clears, the wind changes from the South East to the South West, the temperature rises and the pressure stops falling.

Stage 4:

As the cold front passes the clouds build up, heavy rain falls.

Stage 5:

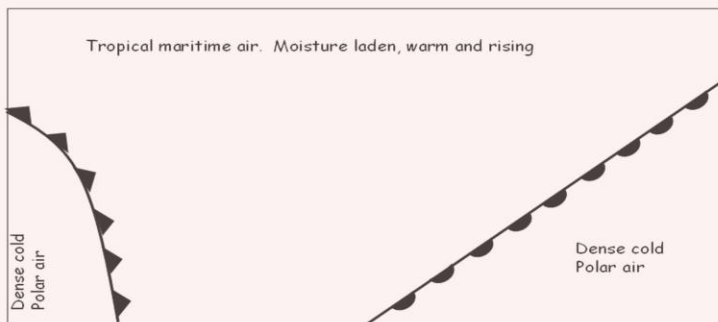
After the cold front passes the wind changes from the South West to the North West, the rain becomes less heavy, the air becomes cooler and there are fewer clouds.



Passage of a Depression

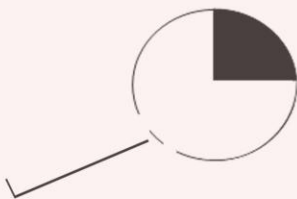
Stage one

Depression



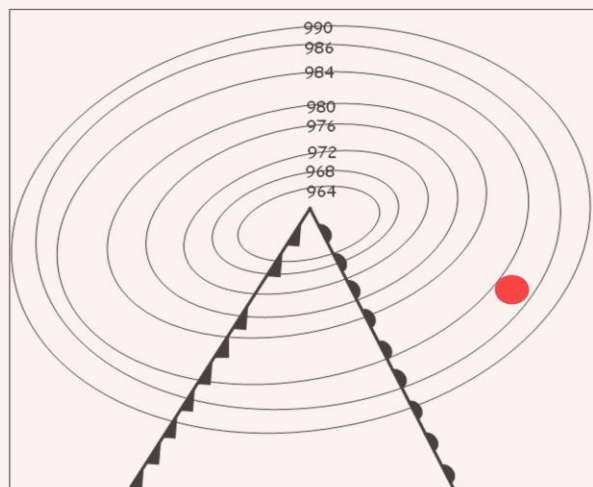
represents cold front

represents warm front



Stage one of a depression weather symbol has 2 oktas of cloud cover, wind speed of 5 knots coming from the south west.

Synoptic Chart for a Depression



Stage 1 Before the Warm Front

Before the warm front arrives the weather is nice and sunny. Then the air turns cold and cirrus clouds develop. Cirrus Clouds are high and thin.



*The fibrous clouds
Patterning the sky
Resembling feathers*

As the air moves the clouds get lower and thicker, and Alto-Stratus and Nimbo-Stratus clouds are formed.

*Grey white colour
Often spreading over the sky
Translucent*



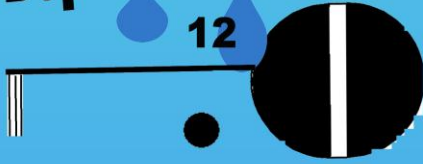
The Nimbo-Stratus clouds bring a long period of steady rain because they are really laden with moisture. At the front, warm air is forced to rise as it meets the cold air. The warm air gets colder as it rises and the water in the air turns to droplets, which form clouds. Thicker clouds are formed at a low level because they contain the most water and that's why it rains.



*In large globular mass
Arranged in groups
Vary greatly*

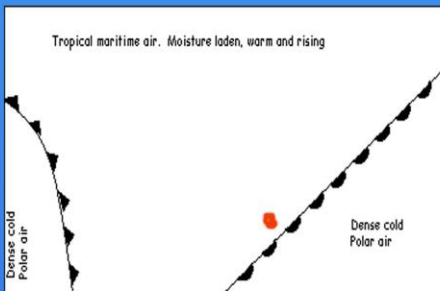
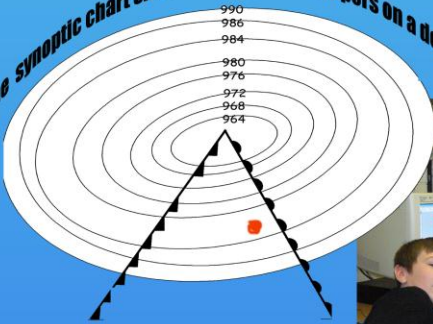
Stage 2 of a Depression

12



A weather station circle shows that the wind direction is coming from the west, the temperature, cloud cover and rain which is shown by the dot.

The synoptic chart shows where stage 2 appears on a depression



This graph shows that stage 2 of a depression is just after a warm front which creates rain represented by the red dot.

*Drip Drop, Drip Drop
Hear the rain
Splash on the ground*

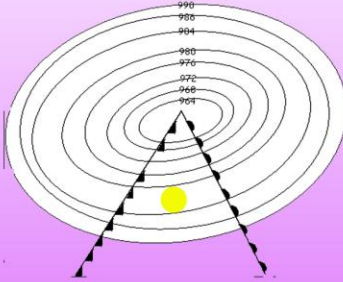
*I'm soft snow
I'm white, fluffy and
fun
I like to be cold, so
wrap up warm.*

The line along which one air stream meets another is called a front. At the warm front the weather will be cloudy with steady rain. Fronts do not usually stay still, they move from the West towards the East. Fronts can move at over 50km/h.

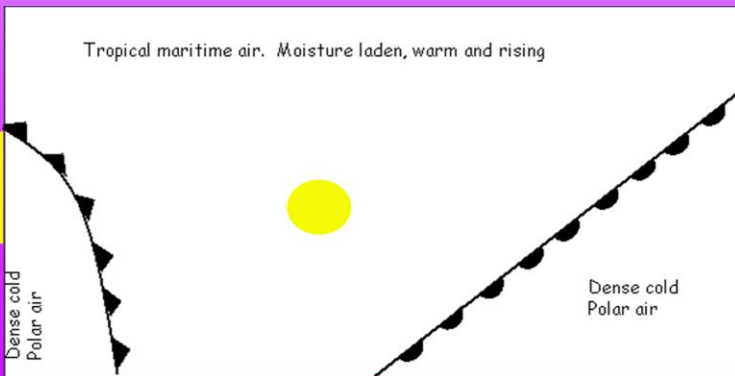
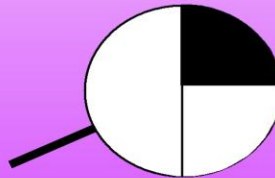
The front will have steady rain due to the warm air passing over the cold air. This happens due to the warm air being lighter. As it rises the pressure falls. The rising air cools down. The water vapour condenses to form a sloping bank of cloud. This is why it begins to rain when a front passes. After the front has passed, the warm air mass has taken over. The temperature then rises and the rain eases off.

STAGE 3

Depression



On this synoptic chart, the yellow dot represents where stage 3 of depression is.

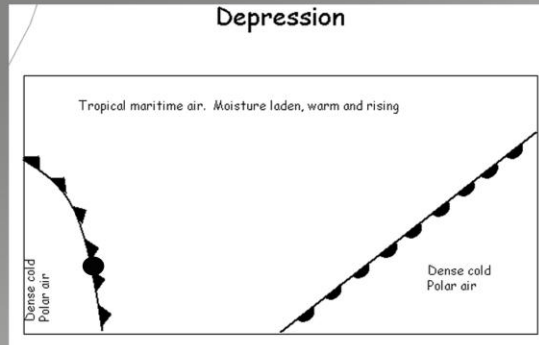
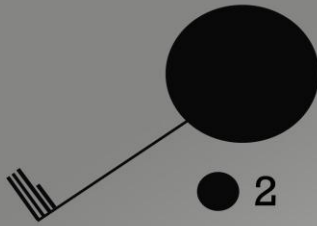


The rain is stopping, and the sky is clearing, we are now in the warm tropical air. This is called the warm sector.

The
drizzling
morning
Fine drips
of water
Drops
splashing

Drizzling
rain at
night
Sparkling
on the road
Drumming
on the roof





Fourth stage of a depression

HEAVY RAIN

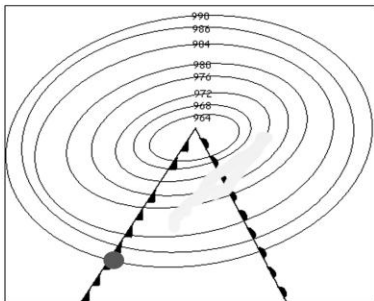


*Clear
crystallised
snow

Is so very cold

It could
freeze your
lemonade rock-
solid*

Synoptic Chart for a Depression



*Early in the
morning
A heavy rain
Hammered on
the roof*

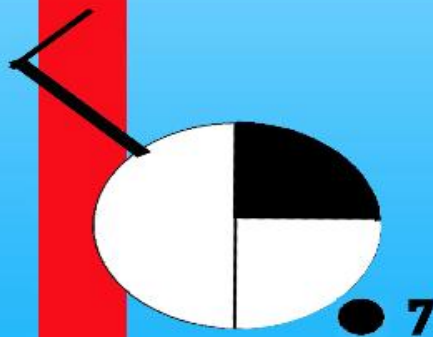
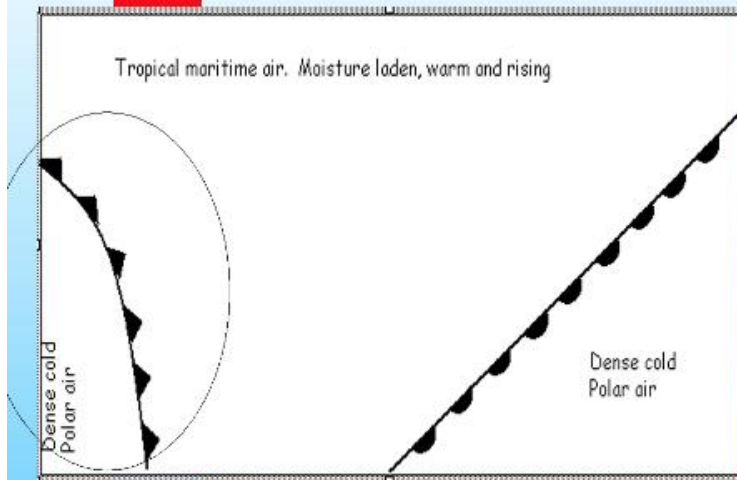
The Cold Front




The cold front travels in a Westerly direction: it brings heavy rain and in extreme conditions winds can reach gale force and there can be hail and thunder. Cold air is more dense than the warm air and the cold air mass undercuts the warm air mass.

The cold front brings Cumulus-Nimbus clouds, which are flat-bottomed and are vertical shaped.

In cold, winter temperatures the precipitation may fall as snow.

STAGE 5 OF THE DEPRESSION

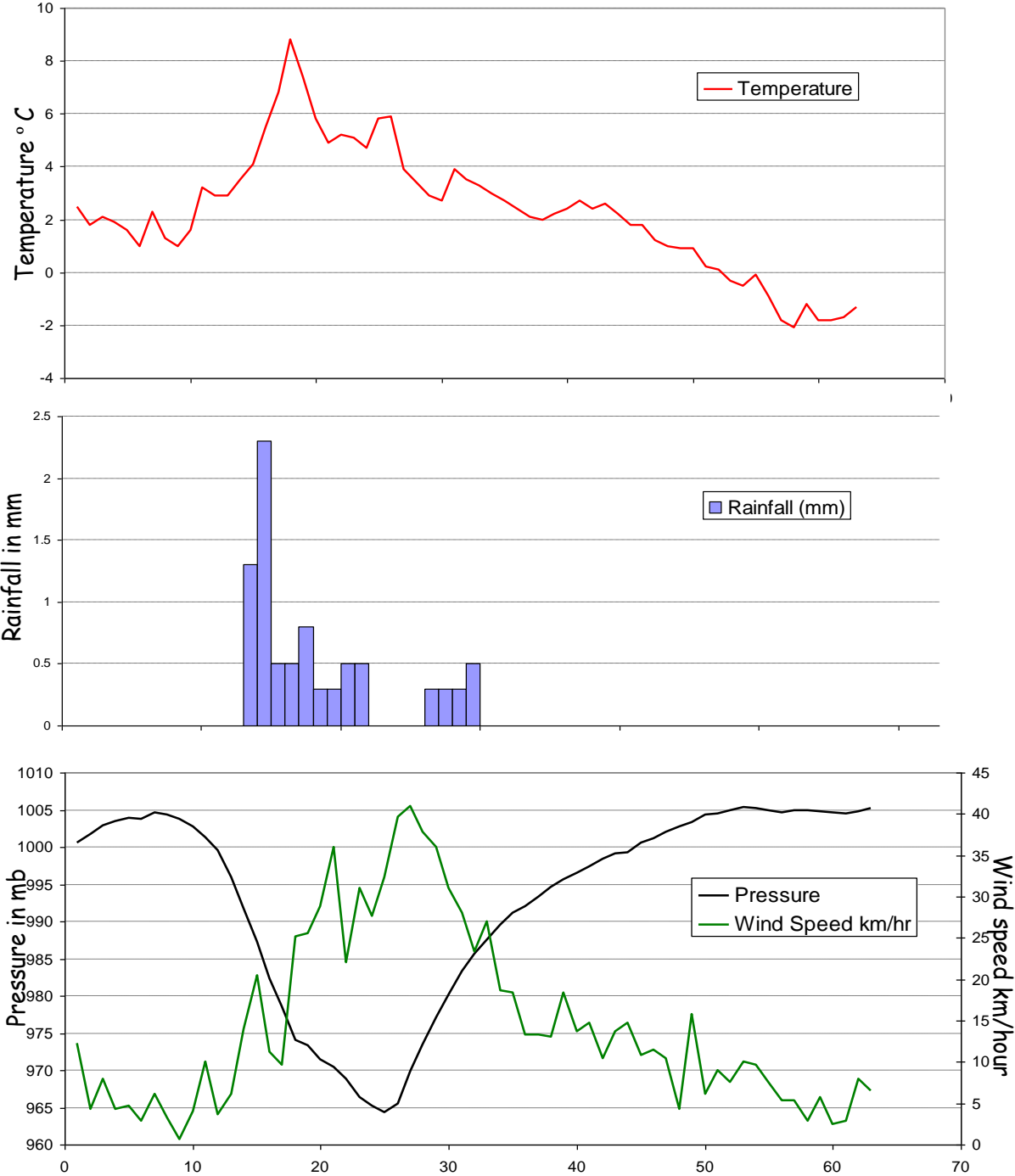


Cloud Cover	Wind direction	Wind speed
3 Oktas 	North West 	5 knots 

After the Cold Front

After a cold front moves through the area the temperature drops, the rain stops and the clouds become more scattered and less heavy. A cold front occurs when cold air replaces warm air

The Passage of a Depression over Aberdeen in December 2011



Hours from 1800 on 6th December 2011

Winter Anticyclone

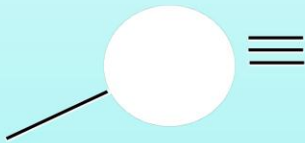
**In a winter anticyclone the weather conditions are:
Cold nights, dry and bright, little cloud and all day fog.**



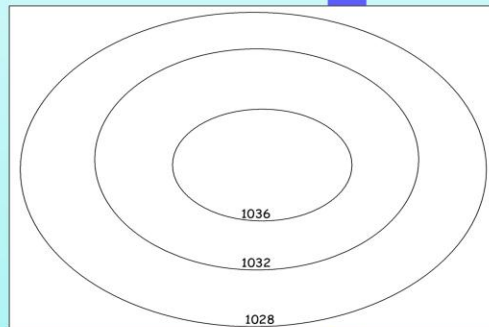
This shows our group working hard !

*I'm slippery ice
I'm glassy clear....
stay away from me
Or face your fear.*

This shows the conditions during a winter anticyclone.



This weather station shows the likely conditions in a winter anticyclone.



Synoptic chart of a winter anticyclone

Anticyclones are high pressure systems. In an anticyclone the air is sinking, the weather is dry, bright and quite calm.

In winter, the high pressure brings very cold weather to Britain. In summer it brings very hot weather.

An anticyclone is a high pressure system: as the air sinks and cools, its ability to hold moisture is greater. This explains why there are no clouds and so there is no rain.

The cold nights associated with anticyclones can be explained by the absence of clouds. If there are no clouds to hold the day's heat close to the earth all the heat will escape into the atmosphere leaving frosty conditions at ground level.

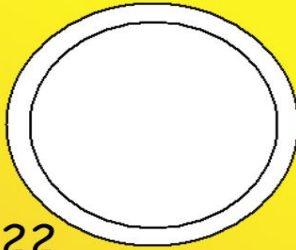
The winter anticyclone can bring fog in the morning but this often clears as the day goes on.



A frosty winter anticyclone



Summer Anticyclone.



22

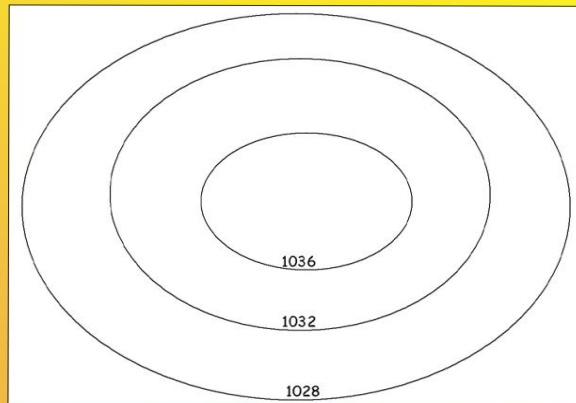
This is a weather symbol to show the weather in a summer anticyclone. This shows calm and hot weather.

*A clear
cloudless sky*

*A sparkling
sun appears*

*Warming the
land*

Synoptic Chart.



A Synoptic Chart is isobars which join up areas of equal air pressure. In a summer anticyclone the air pressure is high.



Summer Anticyclone

In summer, an anticyclone can bring very different weather. Whereas in a depression air is being lifted up, in an anticyclone air is descending. As the air descends, it warms up, causing any water in the air to evaporate. This prevents clouds from forming. With clear skies, all the sun's energy can reach the Earth's surface, raising temperatures dramatically. If the anticyclone remains over the British Isles for several weeks, it produces a heat wave. One of the most notable heat waves in Britain occurred in 1976.