

What is Weather?



Learning Objective

- To understand what weather is and how it affects human activities.

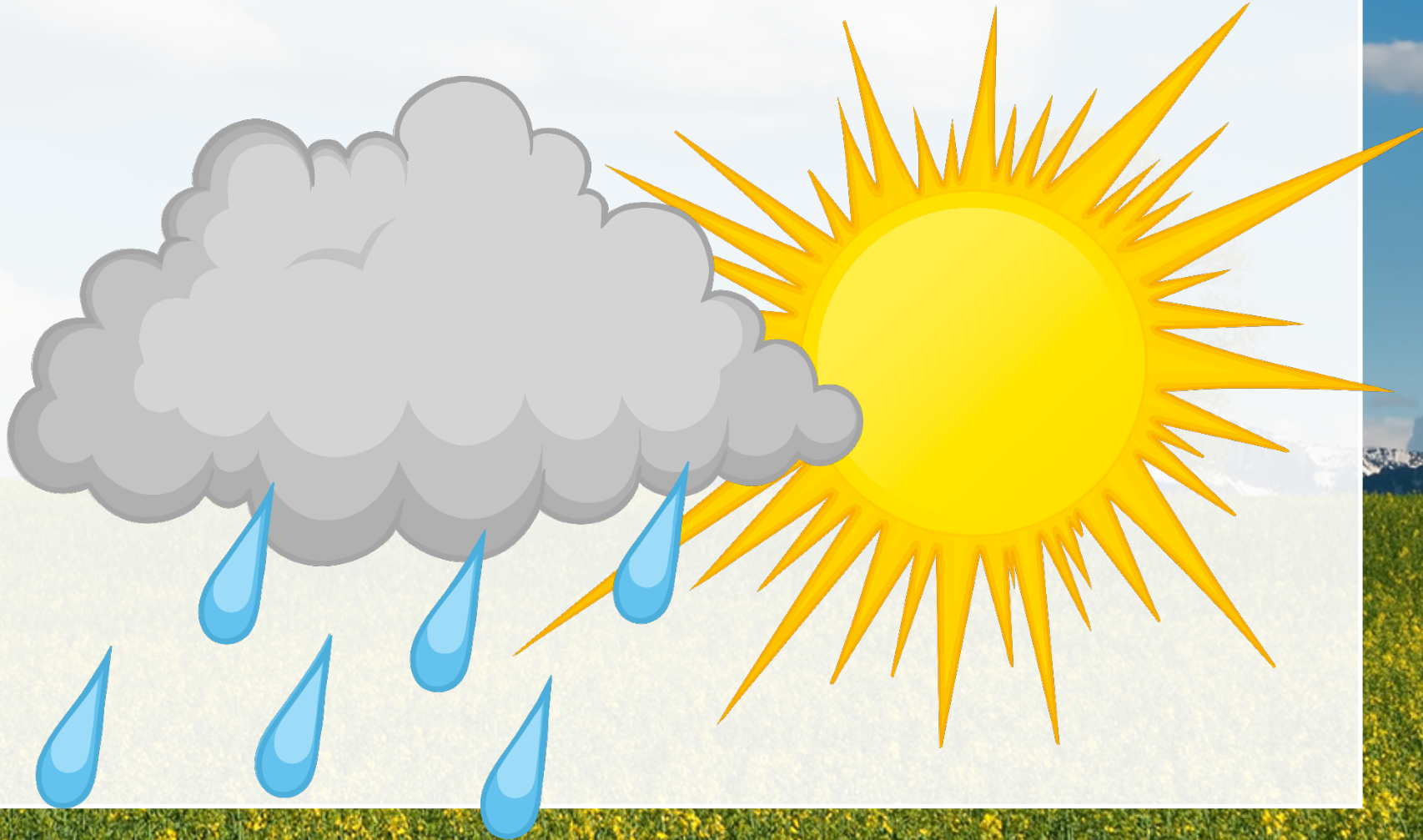
Success Criteria

- To be able to define weather and climate.
- To identify the different types of weather.
- To examine how weather affects human activities.

What Is Weather?



How many types of weather can you think of?



What Is Weather?

Most of our weather occurs in the lowest layer of the Earth's atmosphere, which is called the **troposphere**.



'Weather' and 'Climate'

What Is the Difference?

weather

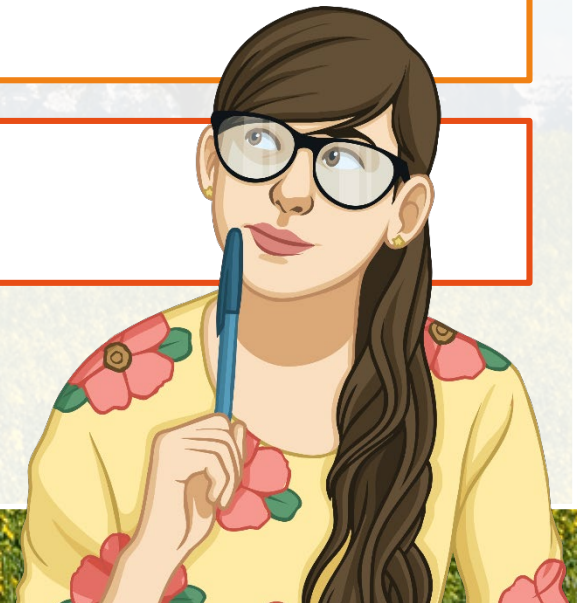
The conditions of the atmosphere, such as temperature and presence of rain and clouds. Weather changes daily.

climate

The average weather conditions of a location over a long period of time. The UK has a temperate climate: warm summers, mild winters and some rainfall all year.

meteorologist

Someone who studies the weather.



‘Weather’ and ‘Climate’?

The next few slides are going to give you options as to whether you are looking at weather or climate.

Can you guess before checking the answer?

What Is the Difference



1. The Sahara Desert is hot and dry all year.



Climate

Next question

What Is the Difference



2. Today has been really hot and sunny.



Weather

Next question

What Is the Difference



3. Last Wednesday was really windy!



Weather

Next question

What Is the Difference



4. Greece is always hot in the summer.



Climate

Next question

What Is the Difference



5. England has cold and wet winters.



Climate

Next question

What Is the Difference



6. There was a huge thunderstorm last night!



Weather

Next question

What Is the Difference



7. The average daytime temperature in Sydney, Australia is 23°C.



Climate

Next question

What Is the Difference



8. The heavy rain last week caused a flood.



Weather

Next question

What Is the Difference



9. This morning, we didn't have to go to school because it snowed!



Weather

Next question

How Does Weather Affect Us?



Can you think of an example of how the weather has affected you in some way?

Maybe heavy rain caused your football match to be cancelled, or perhaps there was some damage to your house.


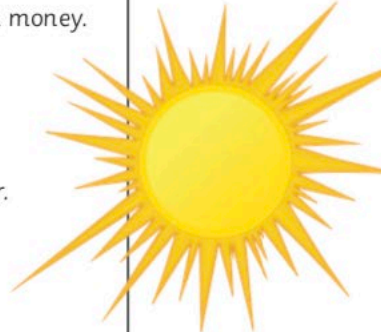

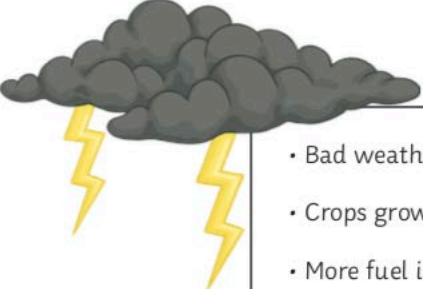
Write a short paragraph to explain what happened.



How Does Weather Affect Us?



Complete the How Does Weather Affect Us table to think of as many examples as you can. There are some points here that may help you with your table.



- Bad weather means people might not go to the shops and spend money.
- Crops grow well in good weather.
- More fuel is used for heating in cold weather.
- Events, e.g. football matches, might be cancelled in bad weather.
- Good weather means fewer delays in road, rail and air travel.
- Icy roads can cause car accidents.
- Sunny weather makes us feel happier!
- Heavy rain can cause flooding of grazing land and damage crops.
- Warm, sunny weather means more people visit places like the beach.

How Does Weather Affect Us?



crop damage

Photo courtesy of CTHOE@wikimediacommons.com



hailstone damage to vehicle



flooded football pitch

Photo © Roger Templeman (cc-by-sa/2.0)



delayed flights

Learning Objective

- To understand what weather is and how it affects human activities.

Success Criteria

- To be able to define weather and climate.
- To identify the different types of weather.
- To examine how weather affects human activities.

Weather and Climate

Measuring the Weather



Learning Objective

- To understand how weather instruments are used to measure the weather.

Success Criteria

- To identify weather instruments and what they measure.
- To interpret cloud cover symbols used on weather maps.
- To explain which groups of people would find the weather forecast useful.

Starter



Unscramble these weather anagrams.



1. UPTERMtaree

2. IRAN

3.
SHINSNUE

4. DINW

5. COLDU

6. ARESURPRISE

Challenge.- Does your family own any weather instruments?
What do they measure?

Starter – Did you get the answers correct?

Unscramble these weather anagrams.

UPTERMAREE

TEMPERATURE

IRAN

RAIN

SHINSNUE

SUNSHINE

DINW

WIND

COLDU

CLOUD

ARESURPRISE

AIR PRESSURE

Does your family own any weather instruments?
What do they measure?



How Do We Measure the Weather?



Key Terms

Weather instruments
are used to measure and
record the weather.

Weather instruments can be found in **weather stations** on land. The Met Office has hundreds of weather stations all over the UK.

Have you ever seen a weather station?

This is a weather station in Kew Gardens, London. You can see the weather instruments inside the fence.



Photo © David Hawgood (cc-by-sa/2.0)

How Do We Measure the Weather?

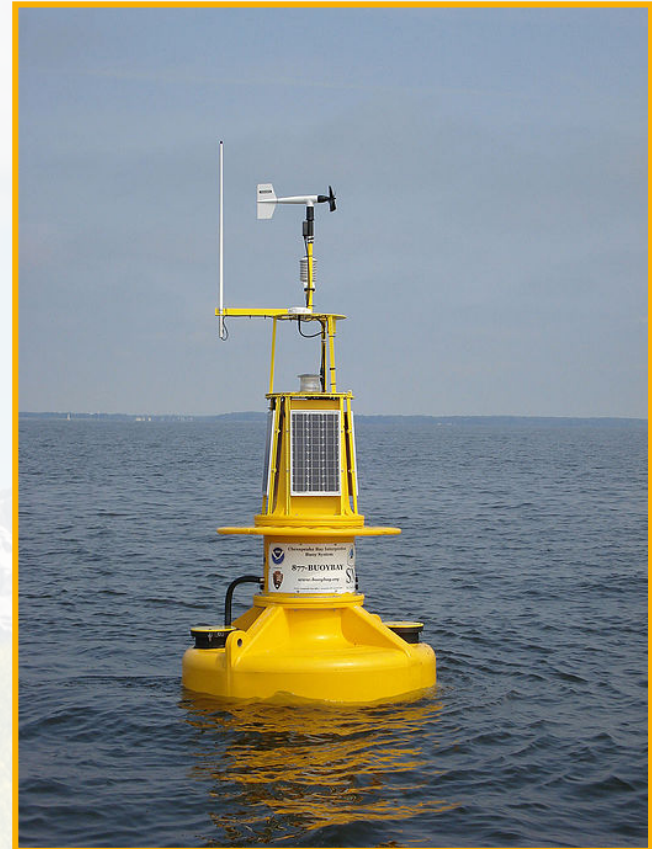


Key Terms

Weather instruments
are used to measure and
record the weather.

Weather instruments can be found in **weather stations** on land. The Met Office has hundreds of weather stations all over the UK.

Weather instruments are also found at sea. They are found on some ships, but mainly on weather buoys designed to monitor weather and sea conditions.



How Do We Measure the Weather?



Planes, weather balloons and satellites also have weather instruments to measure the weather away from the Earth's surface.



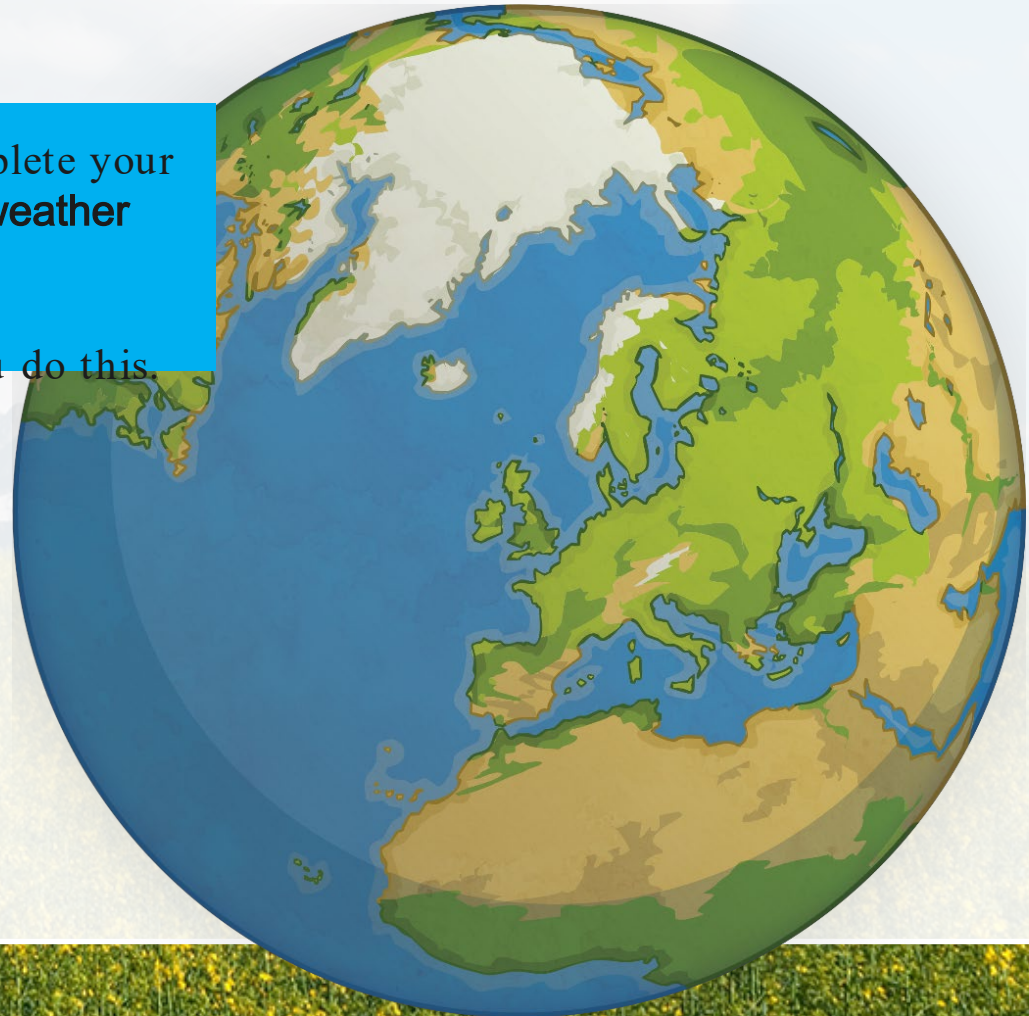
How Do We Measure the Weather?



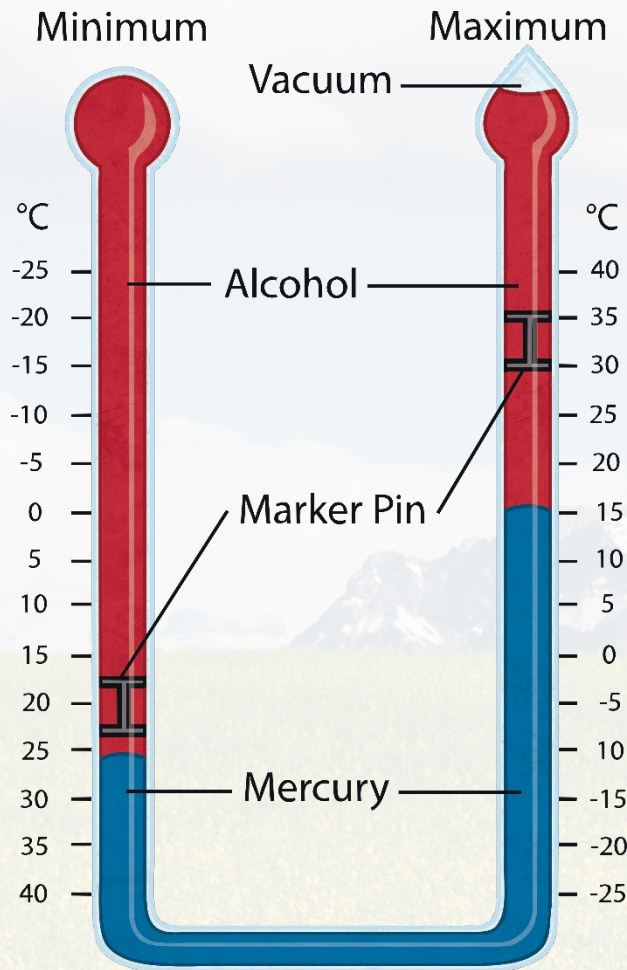
Study the images of six different **weather instruments** . What do you think are the units of measurement?

Use this information to complete your
**How do we measure the weather
table.**

Use slides 28-36 to help you do this.



How Do We Measure the Weather?



Six's thermometer

A **Six's thermometer** is a special thermometer which measures the maximum and minimum **air temperature** over a 24-hour period. Temperature is usually measured in degrees Celsius.

The alcohol expands as temperature increases, and pushes the mercury around a u-shaped tube. The mercury pushes a steel marker pin. This marker remains at the highest temperature reached and can be used to read the **maximum temperature**.

As the temperature falls, the alcohol contracts. A second marker pin can be used to show the **minimum temperature**.

How Do We Measure the Weather?



Stevenson Screen

Thermometers are kept in a special shelter called a **Stevenson Screen**

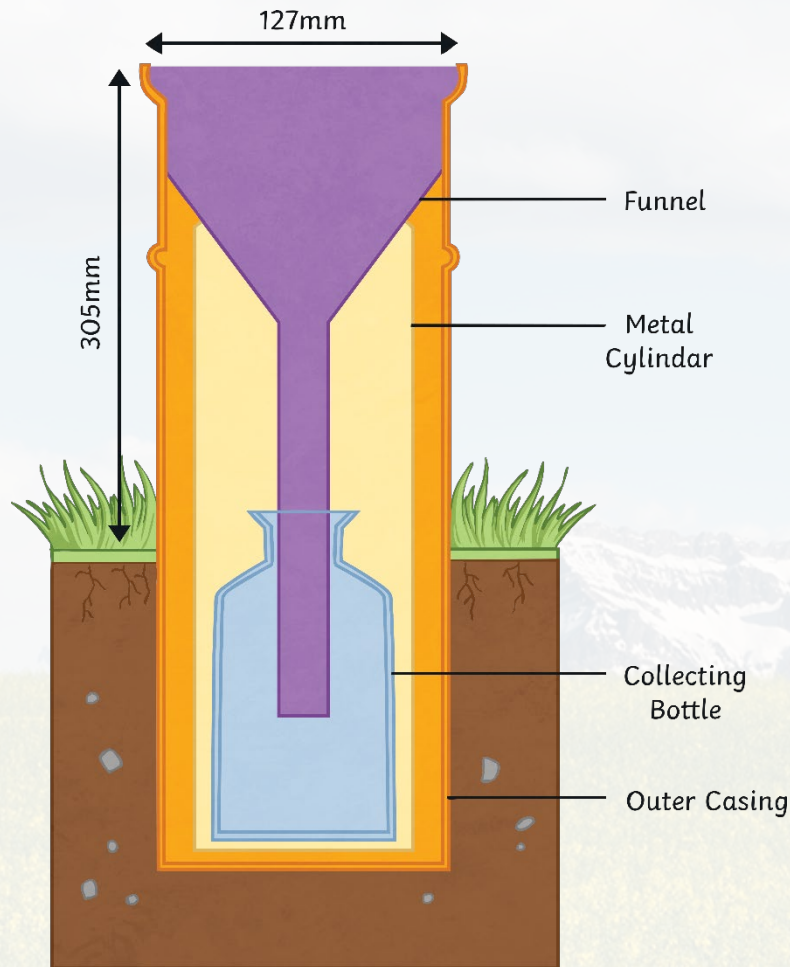
Can you suggest why?

- Temperature needs to be measured in the shade.
- The thermometer is protected from rain, snow and high winds.
- The thermometer is raised off the ground (1.25m) so that air temperature and not ground temperature is recorded.
- Slats on the sides allow air to pass through.
- The Stevenson Screen is painted white to reflect heat.



By Nachoman-au, CC-BY-SA-3.0, via Wikimedia Commons

How Do We Measure the Weather?



rain gauge

A rain gauge measures the amount of **precipitation** (rain, sleet, hail or snow) that has fallen in a 24-hour period. This is usually measured in **millimetres**.

The rain gauge should always be placed in an open space away from trees and buildings.

Can you suggest why?

To prevent precipitation being intercepted (caught) by trees and buildings which would affect how much water is collected.

How Do We Measure the Weather?



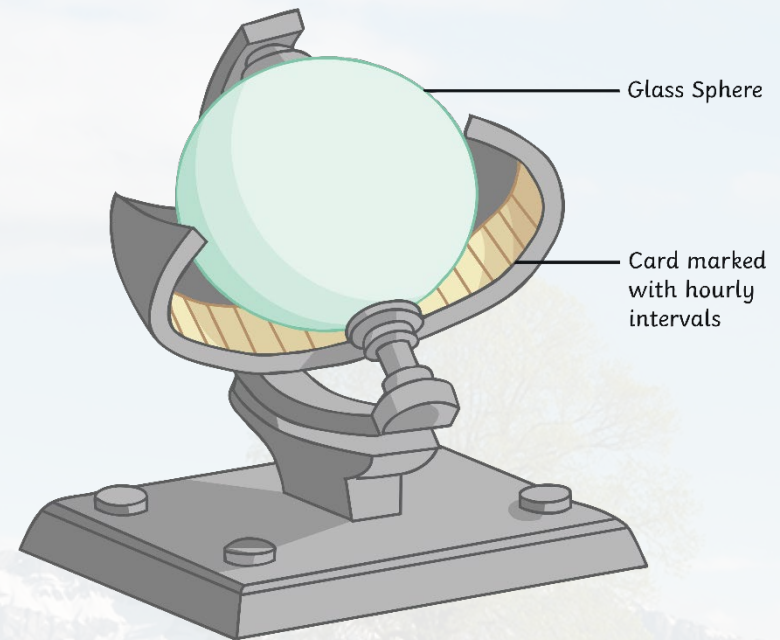
Campbell-Stokes Sunshine Recorder

The Campbell-Stokes Sunshine Recorder measures the amount of sunshine during the day.

A glass sphere concentrates the Sun's rays on a strip of card, burning a small hole (just like a magnifying glass!).

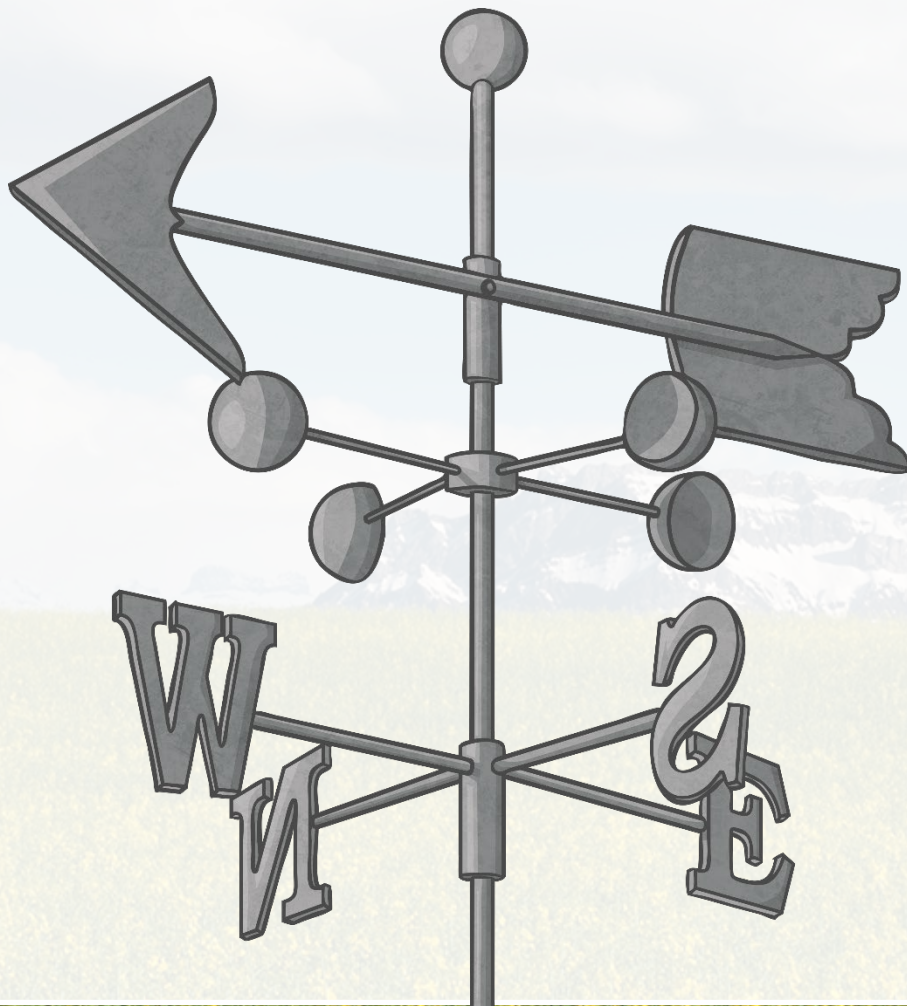
As the Sun moves across the sky, the rays are directed at a different section of the card.

The length of burnt sections can be added up to give the total amount of sunshine.



How many hours of sunshine were there in this example?

How Do We Measure the Weather?



wind vane

A wind vane shows the wind direction.

The arrow points in the direction the wind is blowing from.

What is the wind direction shown in the photo?

Westerly wind

How Do We Measure the Weather?



barometer

A barometer measures air pressure. This is the force or weight of the air above us.

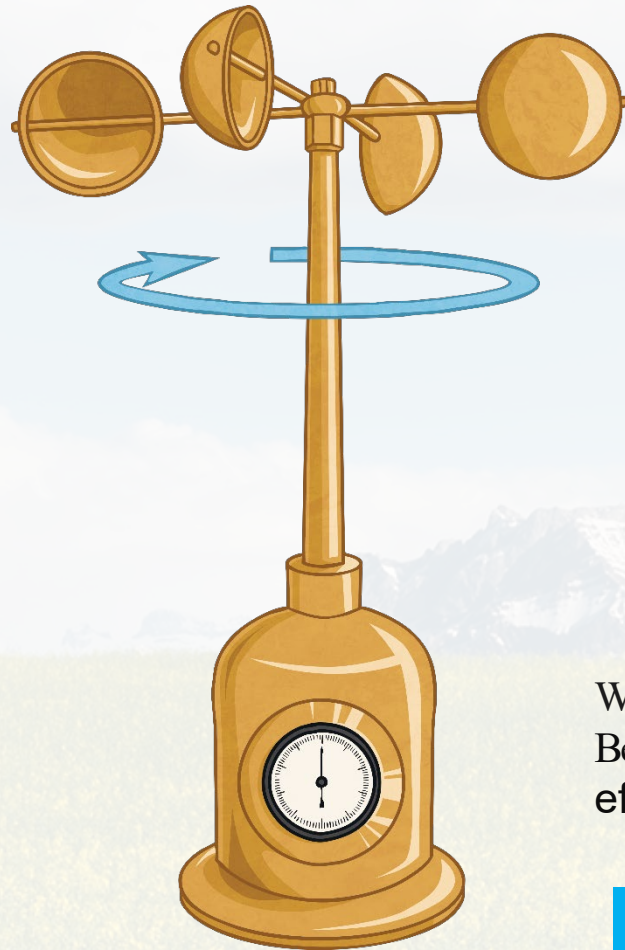
A high pressure reading means sunny and dry conditions.

A low pressure reading means stormy and wet conditions.

What air pressure is shown in this barometer?



How Do We Measure the Weather?



anemometer

An anemometer is used to measure wind speed in miles or km per hour. The cups rotate in the wind and turn a vertical rod. The stronger the wind blows, the faster the cups and the rod spin. The anemometer counts the number of rotations which is used to calculate wind speed.

Wind strength can also be measured by using the Beaufort Scale. This scale uses observations of the effects of the wind to determine wind speed.

Complete the Beaufort Scale Activity Sheet.

How Do We Measure the Weather?



cloud cover

The amount of cloud cover can be measured visually.

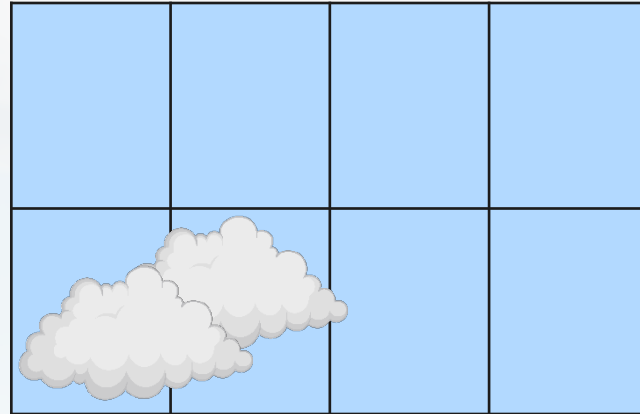
An area of sky above a weather station is divided into eighths.

The fraction of sky covered by cloud is then estimated.

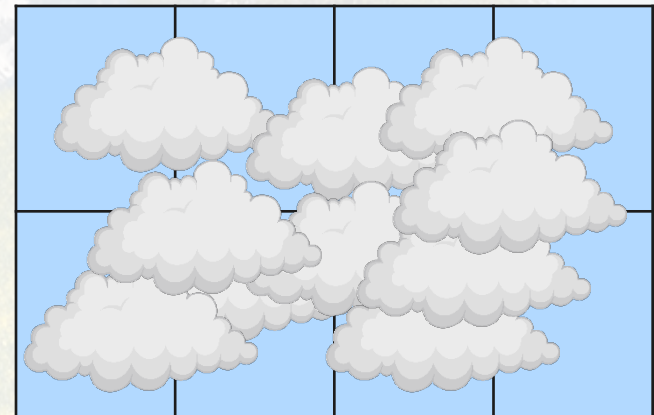
Cloud cover is shown in oktas (eighths).

What cloud cover is shown in the diagrams?

Sky A 1 okta



Sky B 5 oktas



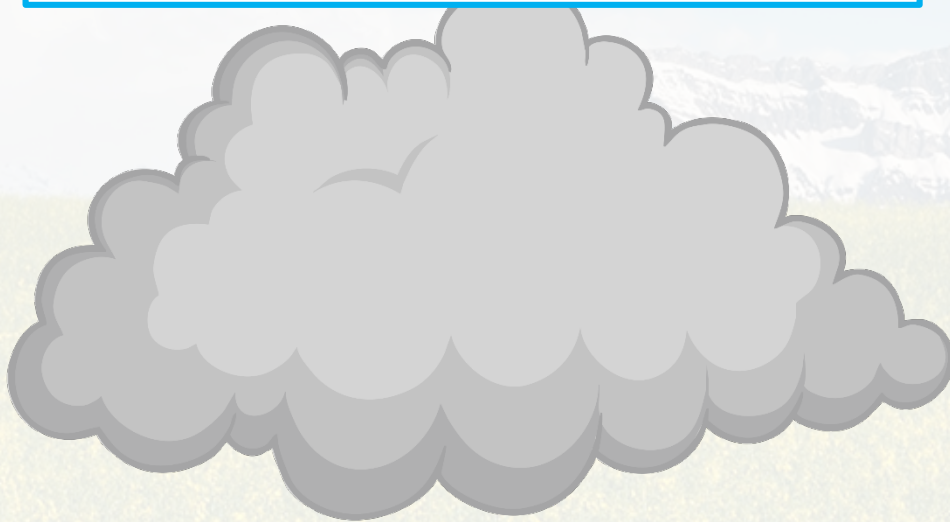
How Do We Measure the Weather?













cloud cover

The amount of cloud cover for an area can be shown by a symbol on a weather map.

The shaded part of the circle represents the amount of cloud cover.



Cloud Cover

Symbol	Scale in oktas (eighths)
	0 Sky completely clear
	1
	2
	3
	4 Sky half cloudy
	5
	6
	7
	8 Sky completely cloudy
	9 Sky obstructed from view

Weather Forecasting



Information from weather instruments and weather satellites is used to create a weather forecast.



weather forecast
a prediction of what the weather will be like in the next few hours, days, weeks or even months.



prediction
what someone thinks will happen.

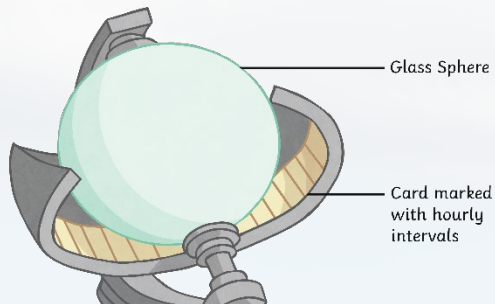
Think of **four different groups of people** who would find a weather forecast useful. Give detailed reasons for each choice in the table on your worksheet



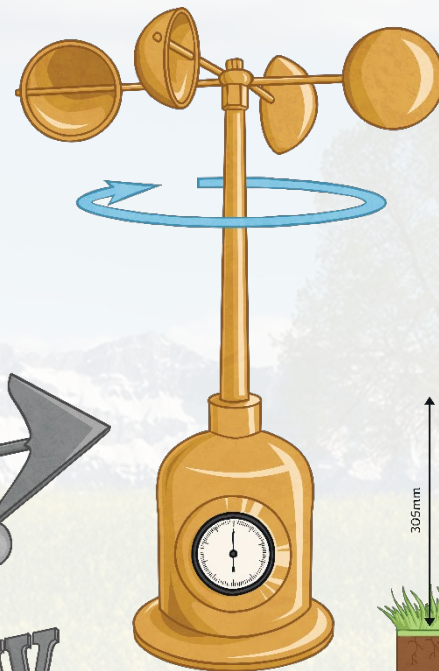
Name the Weather Instrument



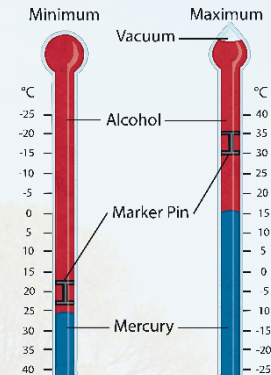
Can you name the weather instruments and give one fact about each?



Campbell-Stokes sunshine recorder



anemometer



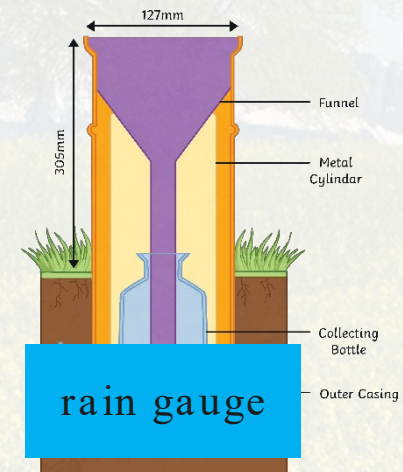
Six's Thermometer



barometer



wind vane



rain gauge

Complete your weather instrument word search

Learning Objective

- To understand how weather instruments are used to measure the weather.

Success Criteria

- To identify weather instruments and what they measure.
- To interpret cloud cover symbols used on weather maps.
- To explain which groups of people would find the weather forecast useful.