

Weather and Climate

How can we collect weather data?



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How can we record and measure weather phenomena?



Key question we will answer:

How can we collect weather data?

Key geographical knowledge we will use: Physical Geography, Geography Skills and Fieldwork

Key geographical concepts we will use: Physical Processes

Key question we will answer:

How can we collect and record weather data?

Key geographical knowledge we will use: Physical Geography, Geography Skills and Fieldwork

Key geographical concepts we will use: Physical Processes

Key question we will answer:

How can we present weather data?

Key geographical knowledge we will use: Physical Geography, Geography Skills and Fieldwork

Key geographical concepts we will use: Physical Processes

Key question we will answer:

How can we analyse our weather data and evaluate our fieldwork?

Key geographical knowledge we will use: Physical Geography, Geography Skills and Fieldwork

Key geographical concepts we will use: Physical Processes



Key vocabulary for this lesson:

weather – a description of what the conditions are like in a particular place over a short period

meteorologist – a type of scientist that studies the atmosphere to predict and understand Earth's weather

precipitation – water vapour or moisture that falls from the clouds in the form of rain, sleet, snow or hail

temperature – the measure of how hot or cold an area is

thermometer – an instrument used to measure temperature (how hot or cold it is)

weathervane – an instrument used to measure wind direction

rain gauge – an instrument used to measure rainfall and snowfall

okta – a unit of measurement used to describe the amount of cloud cover



Let's discuss



Weather words

drizzle	breezy
hurricane	clear
snow	rain
cold	hot
overcast	windy
freezing	cloudy
foggy	gale
warm	hail

New word alert!

data – information

Look at the **list of weather words** you created in the **previous lesson**.

Discuss the **following questions** with your **learning partner**:

- What **kind of weather** do these words describe?
- Can you **group** them into **different kinds of weather**, such as '**precipitation**', '**wind**', '**cloud**' and '**temperature**'?

Be ready to **share your feedback** with the class before the **answers are revealed**.



Let's discuss answers

Precipitation	Wind	Cloud	Temperature
drizzle	hurricane	overcast	hot
snow	breezy	foggy	cold
rain	windy	cloudy	warm
hail	gale	clear	freezing

Remember, if there is **no cloud**, then it is **clear**. That means it will be **sunny**.



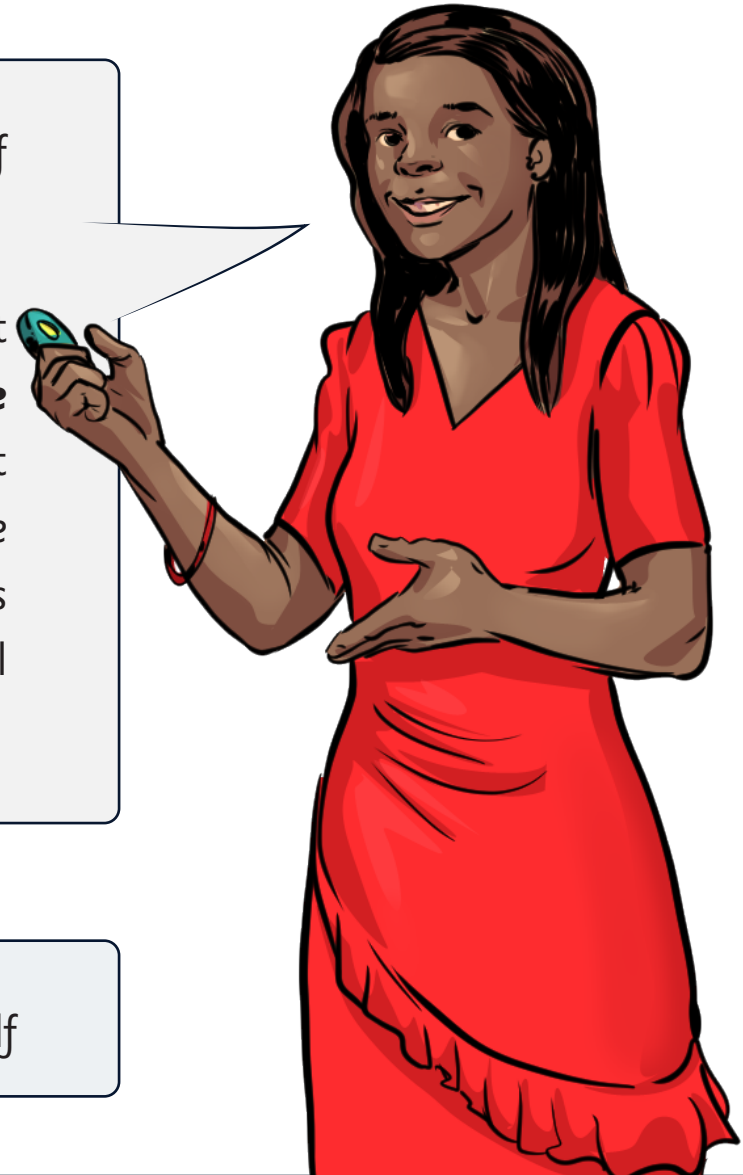
How do meteorologists measure weather?

Hi! My name is **Jada**, and I am a **meteorologist**. I use lots of special equipment to **measure the weather**.

There are **weather stations** with this equipment at different **places around the UK, the world, and the oceans**. **There are also satellites** in space that collect weather data. You will not have the same equipment in school, but we can still do some excellent **weather fieldwork**. We will be making observations and **collecting, recording and evaluating data**. These are all fieldwork skills!

New word alert!

fieldwork – when you go outside to find things out for yourself



How do meteorologists measure precipitation?



Meteorologists measure **precipitation** using a **rain gauge**.

Look **carefully** at the picture. You will notice that the **rain gauge**:

- is **see-through** so that you can see the **water** inside
- is **wider at the top** to catch the rain
- has **measurements** written on the side in **mm**
- is **raised off** the ground
- is placed in the **open and not covered by roofs or branches**

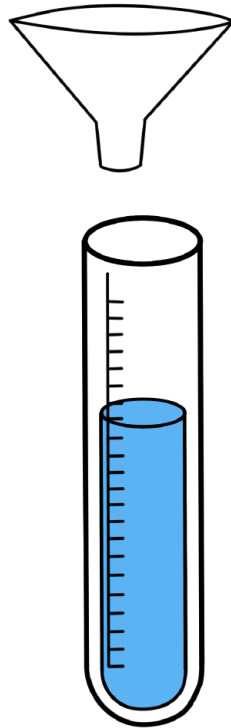


How will we measure precipitation?

You may have noticed that the containers you have in the classroom have **millilitres (ml)** marked on the side rather than **millimetres (mm)** that you saw on the side of the **rain gauge** on the previous slide. Do not worry about this. We can still do useful **fieldwork** using ml.

The container must be **small and narrow** to measure rain using the ml on the side. If it is too big, you will not be able to measure the small amount of **precipitation** that falls.

To catch the rain, it must be **wide at the top**, so you must use a **funnel**.



Check that you choose a container that:

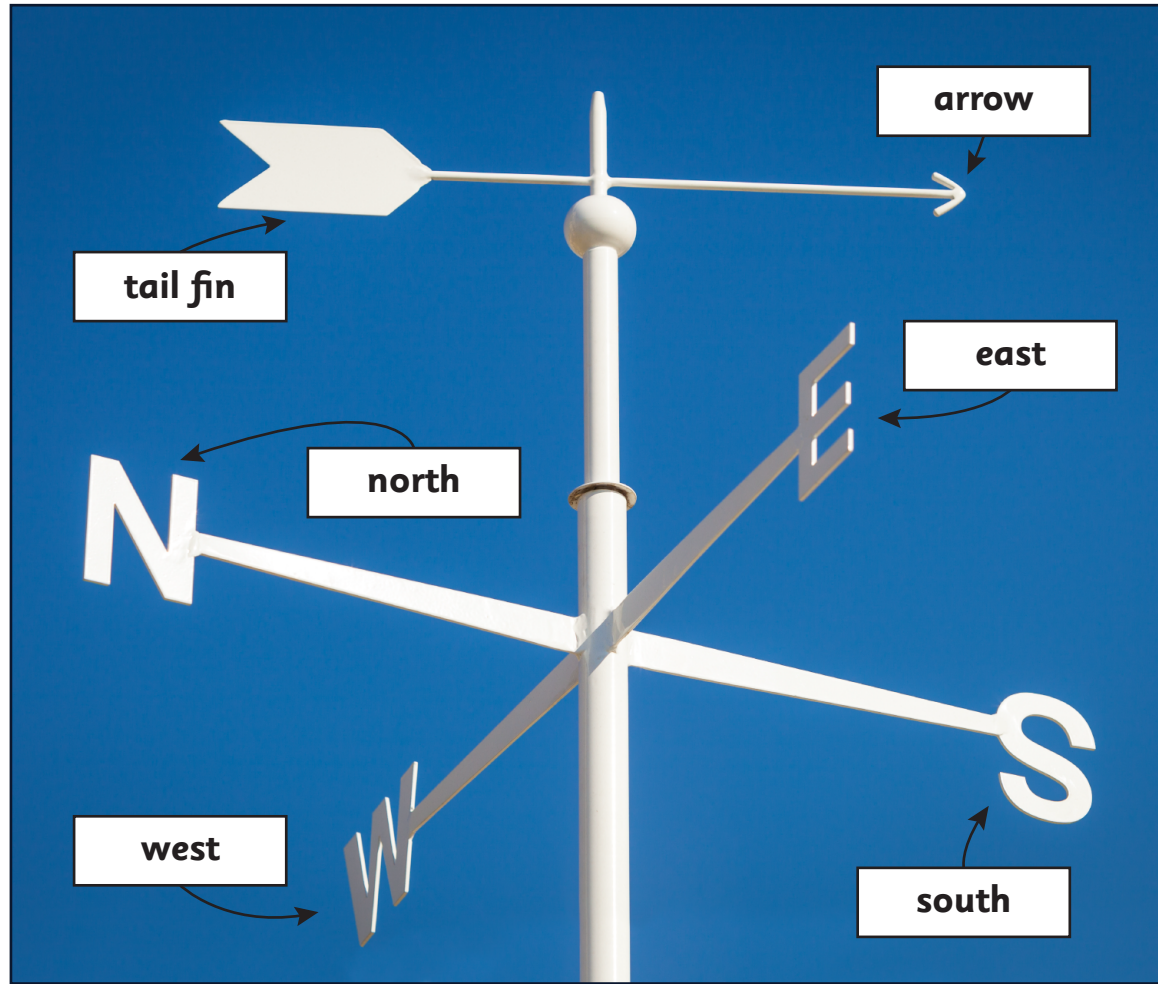
- is **wide** at the top (or has a **funnel**)
- is **see-through**
- has **measures** marked on the side
- is a **sensible size**

Check that you choose to place it somewhere that:

- is in the **open** and not covered by a roof or branches
- is **raised** where it will not be knocked over



How do meteorologists measure wind direction?



This is called a **weathervane**.

To read a weathervane, look at the **direction the arrow is pointing in**, which is the **direction the wind is coming from**.

Wind direction is where the **wind has come from**, not where it is going. For instance, in the picture on this slide, the arrow points towards the '**S**', which stands for '**south**'. The **tail fin** catches the wind, and the **arrow** points toward the direction the wind is blowing from. The arrow on the weathervane in the picture points **south**, meaning there is a **south wind**. The wind is blowing from **south to north**.

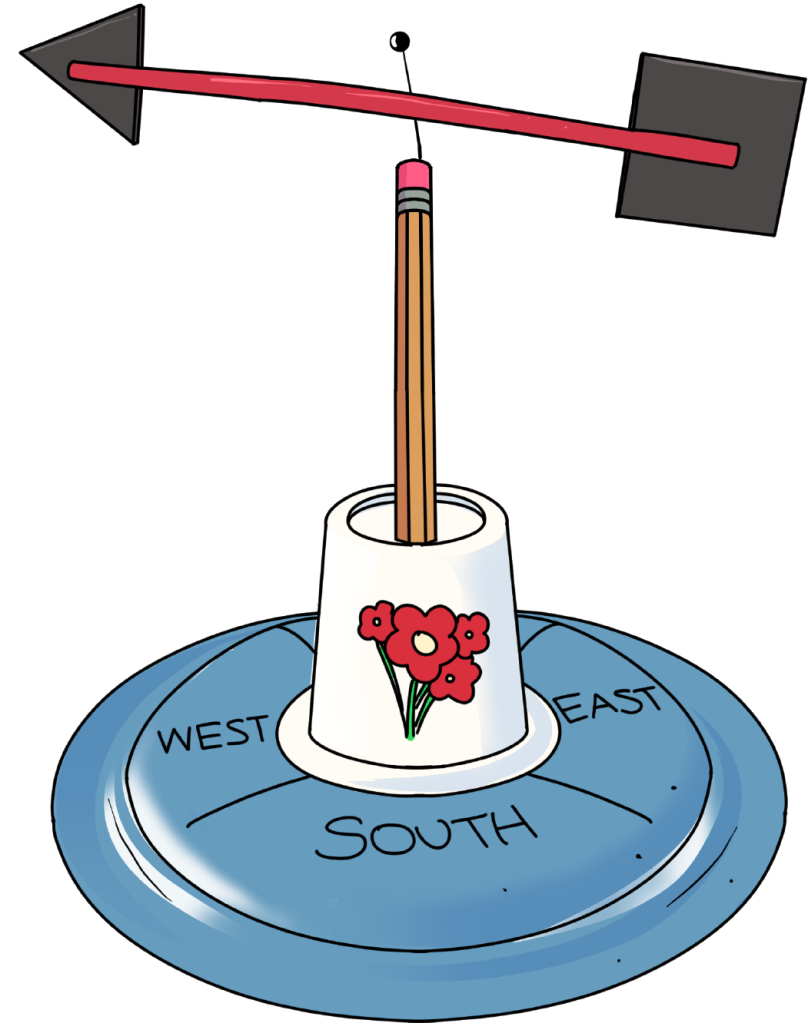
This can tell us a lot about the **weather**. When the wind is coming from the **north**, it is usually going to be a **colder day**, and when it is coming from the **south**, it is likely to be a **warmer day**.

The weathervane is **placed high up**, and somewhere that is not sheltered from the wind.



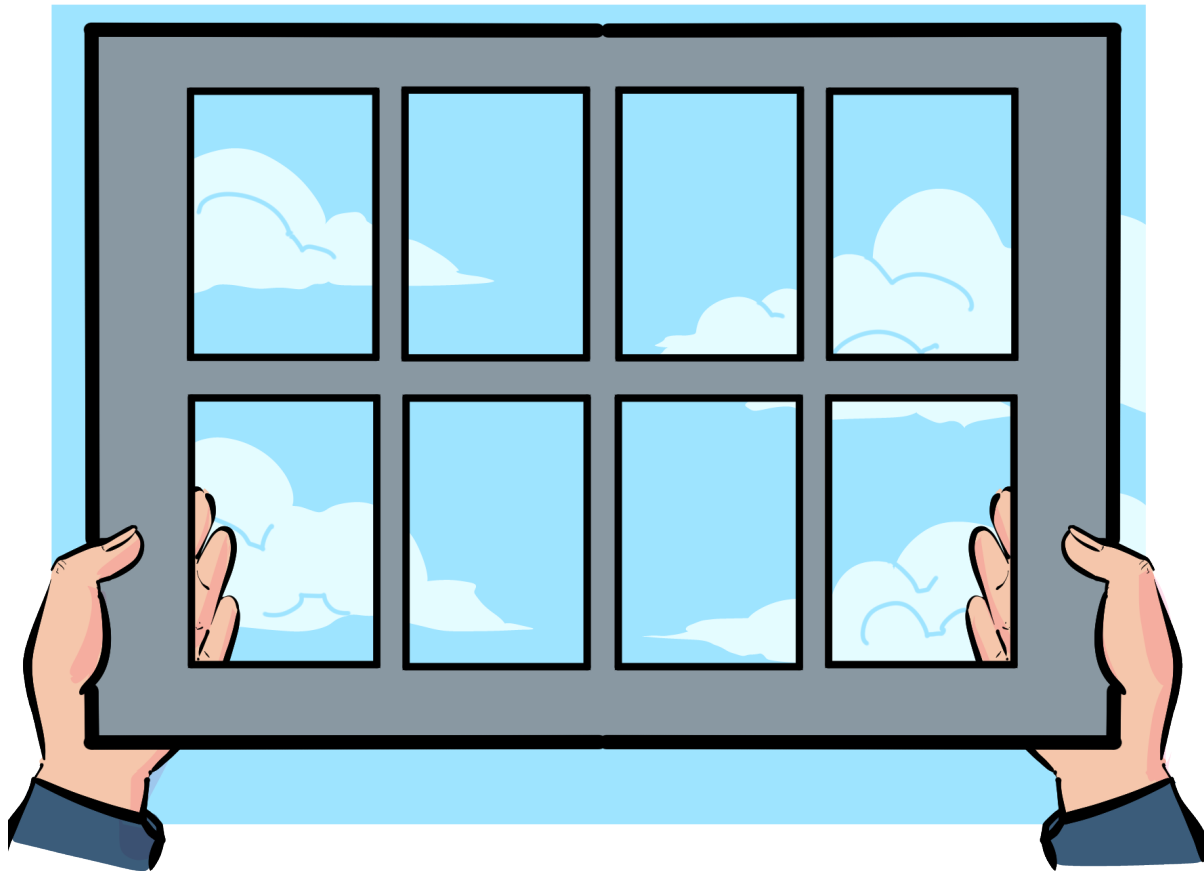
Make a weathervane

1. Mark a paper plate with the points **north, south, east and west**.
2. Push the **pencil** through the bottom of the **yogurt pot**.
3. Glue the **yogurt pot** upside down on the paper plate.
4. Cut out a **square and a triangle** from the card for each end of the **weathervane** (The square needs to be a little bigger than the triangle so it is pushed in the same direction the wind is travelling. The arrow will then point to where the wind is coming from).
5. Make a **3cm cut** at each end of the straw and fix the shapes into them.
6. Carefully (ask an adult to help) push the **pin** through the **straw** into the **eraser**.
7. Make sure the straw can **spin freely**.
8. Place the weathervane **outside** where it is not sheltered and will not be knocked over. It will need to be stuck down so it does not blow away.
9. Using a **compass**, your teacher will help you ensure it is facing correctly.



How do meteorologists measure cloud cover?

Cloud cover means **how much of the sky is covered with clouds**.



When we measure cloud cover, we use our **observation skills**.

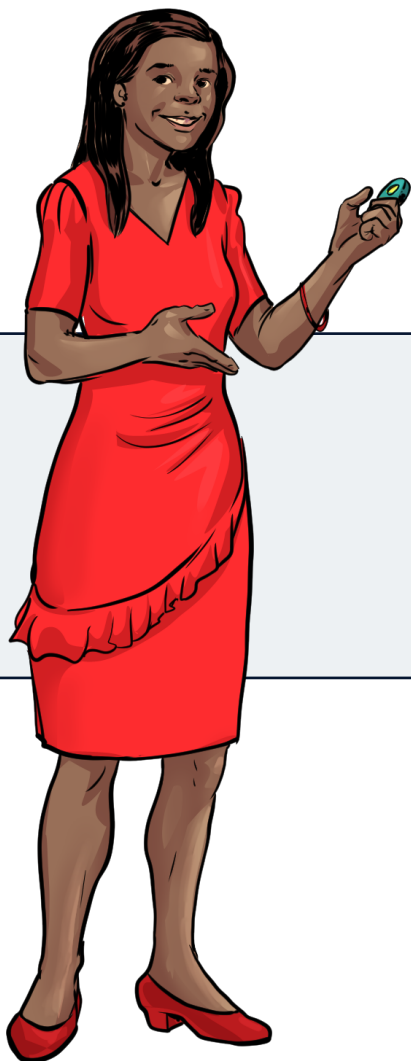
We can divide the sky into **eight equal parts** and see how many of these parts, called **oktas**, are **covered by clouds**.

We are going to measure **cloud cover** in your location. First, cut **eight squares** out of a piece of card, as shown in the **picture**.

Hold your card up to the **sky**. The sky is **overcast** if all eight squares are filled with clouds. If all eight squares are empty, then the sky is **clear**. When there is some cloud, we estimate how many **squares** it would fill if it was all **clumped together**.



Stop and jot 1



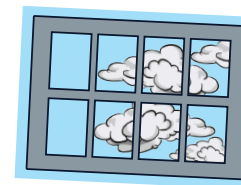
We can use **words**, as well as **numbers**, to describe **cloud cover**.

Complete your stop and jot 1 worksheet to **practise counting oktas and describing cloud cover**.

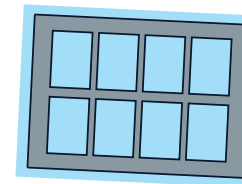
Stop and jot 1

How much is covered with clouds?	Describing words to use
eight oktas covered	overcast
approximately six oktas covered	broken clouds
approximately four oktas covered	scattered clouds
approximately two oktas covered	few clouds
zero oktas covered	clear

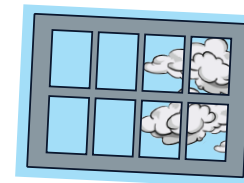
Not every **number** is included. You can decide which of the above words to use for **1, 3, 5 or 7 oktas**.
Use the **scale** above to describe the **cloud cover** of these skies. The **first one** has been done for you.



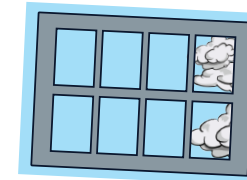
About six oktas are covered.
There are few clouds.



About _____ oktas are covered.
It is _____.



About _____ oktas are covered.
There are _____.



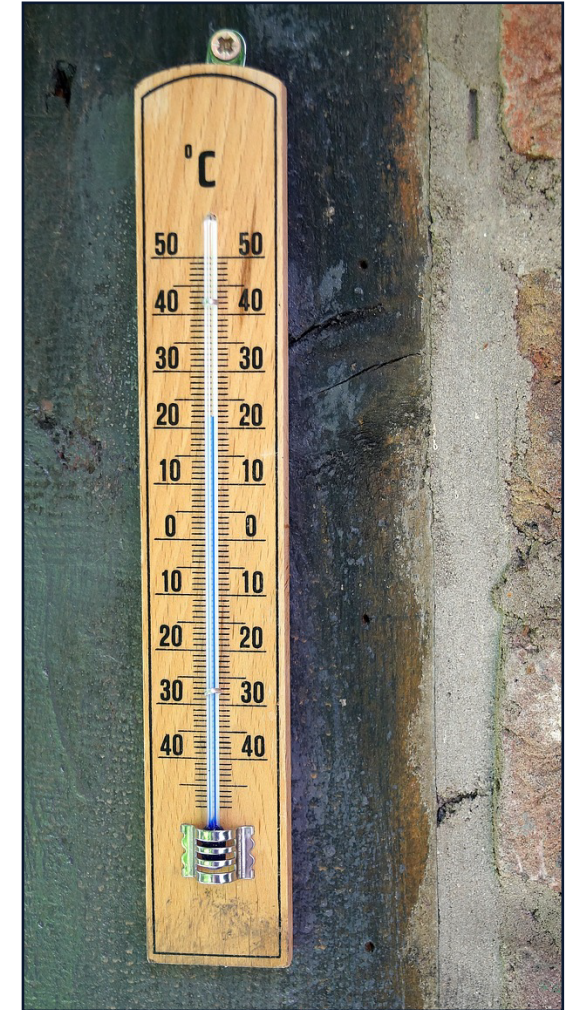
About _____ oktas are covered.
There are _____.

How does a meteorologist measure temperature?



Meteorologists measure the temperature of the air using a **thermometer**. In the **UK**, we measure temperature in degrees **Celsius (°C)**.

Thermometers have **liquid** in them like this one. The liquid **rises** when the temperature goes up and **falls** when the temperature goes down. Sometimes the temperature goes **below 0°C**, which means it is **freezing**.



How does a meteorologist measure temperature?



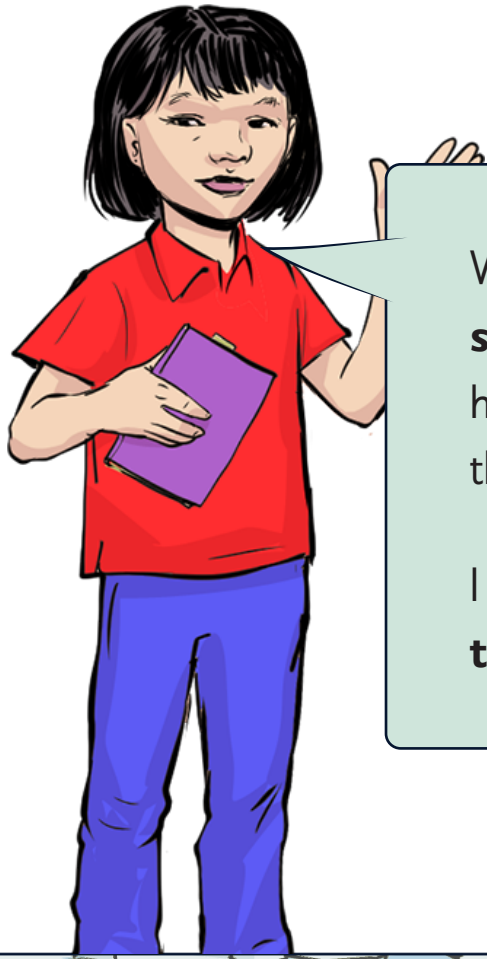
We keep our thermometer inside a **Stevenson screen** to **measure the temperature accurately**.

These white boxes, with **air holes**, are **raised above the ground**, usually on **grass**. This **helps ensure** that only the **temperature of the air** is taken.



How will we measure temperature?

Angie is outside and is trying to decide where to put a **thermometer** to measure the **temperature of the air**. Can you give her some **advice**?



We don't have a **Stevenson screen** at school, so I don't know how to ensure I am only taking the **temperature of the air**.

I wonder where I should put the **thermometer**.

Discuss the **following questions** with your **learning partner**:

- **Where** should Angie put the thermometer?
- Does she need a **Stevenson screen**?
- Where could you put the thermometer at your **school**?

Be ready to **share your feedback** with the class before the **answers are revealed**.



How will we measure temperature?

answers

Angie could make a Stevenson screen using a white shoebox with air holes. But she doesn't need to make one if she remembers that her thermometer should be:

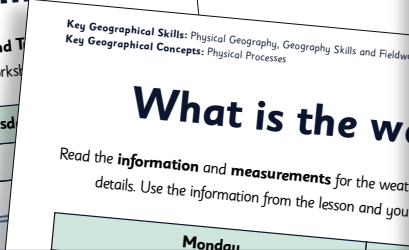
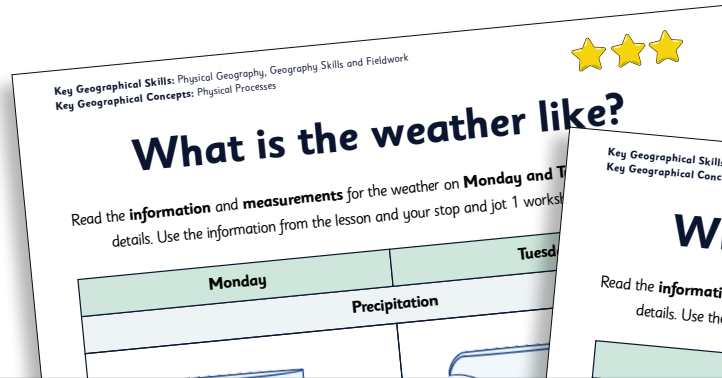
- in a sheltered spot that is not in direct sunlight but not too shady either
- raised above the ground
- secure so that it does not get damaged
- at the right height for her to read it
- in a natural area, like grass, rather than on concrete



Activity 1



Use the knowledge you gained from this lesson and your stop and jot 1 worksheet to fill in the details on the **diagrams** and the **missing words** from the **weather data** collected on your activity 1 worksheet.



Key Geographical Skills: Physical Geography, Geography Skills and Fieldwork
Key Geographical Concepts: Physical Processes

What is the weather like?

Read the **information** and **measurements** for the weather on **Monday** and fill in the details. Use the information from the lesson and your stop and jot 1 worksheet to help you.

Monday	
<p>Precipitation</p> <p>_____ mm of rain</p>	<p>Temperature</p> <p>_____ °C</p>
<p>Cloud cover (Use your stop and jot 1 worksheet for the description of the clouds)</p> <p>_____ clouds</p>	<p>Wind direction (Remember – the arrow points to where the wind is coming from)</p> <p>There is a _____ wind.</p>

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Challenge


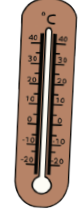
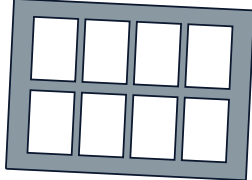
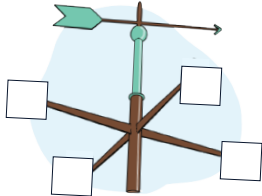


Think about how the **weather** might be on a typical day in **winter**.

Fill in the **diagrams and descriptions** on your challenge worksheet.

Challenge

Put details on the **diagrams**, draw **pictures** and write **descriptions** for a day in **winter**.

<p style="text-align: center;">Precipitation</p> <p>Draw the water in the jug.</p>  <p style="text-align: center;">_____ mm of rain</p>	<p style="text-align: center;">Temperature</p> <p>Draw the liquid in the thermometer.</p>  <p style="text-align: center;">_____ °C</p>
<p style="text-align: center;">Cloud cover</p> <p>(Use your stop and jot 1 worksheet for the description of the clouds)</p> <p>Draw the amount of cloud cover in the okta measure.</p>  <p style="text-align: center;">_____ clouds</p>	<p style="text-align: center;">Wind direction</p> <p>(Remember – the arrow points to where the wind is coming from)</p> <p>Draw north, south, east and west on the weathervane to show where the wind is blowing from.</p>  <p style="text-align: center;">There is a _____ wind.</p>

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