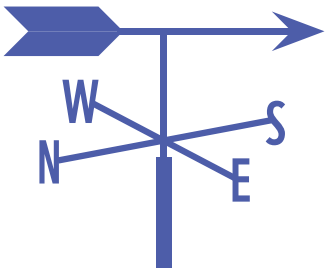


EXPLORING MOVEMENT

You are going to measure the wind in two ways:

- Using a weathervane to look at wind direction
- Using an anemometer to compare wind speed

Follow the instructions to make your own wind monitoring equipment, then use this worksheet to help you plan and record your research.

CLIMATE FACTS

- The Earth is windy because the planet is warmer in some places than others. As the hotter air rises the cooler air is drawn underneath it. We feel this movement as wind.
- The Shetland Islands off the coast of Scotland are the windiest location in the UK.
- The fastest gust of wind ever at 253mph was recorded in 1996 by an unmanned instrument station in Barrow Island, Australia, during Typhoon Olivia.
- The UK has an average of 33 tornadoes a year, which due to our relatively small size means we have more tornadoes per km^2 each year than any other country!

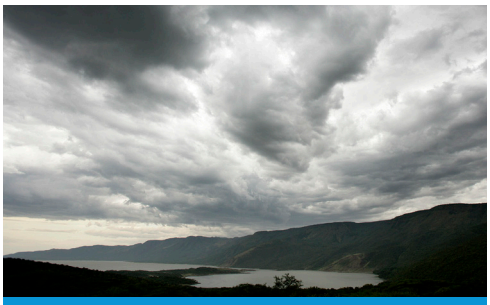
1 Think about the best place in your school to put your anemometer and weathervane. Use the space below to write why you have chosen this location.

2 When and how often will you record your readings? Who will do this?

3 How will you present your findings?

4 How could this equipment be used to monitor climate change?

EXPLORING THE WATER CYCLE



CLIMATE FACTS

- The biggest clouds are thunderclouds (cumulonimbus) which can hold as much as 500,000 tons of water.
- Natural materials such as untreated sheep's wool and seaweed (kelp) can be used to predict rain as they respond to changing levels of moisture in the air – swelling up when the air is damp and shrinking when the air is dry.
- Hygrometers use human hair to measure humidity, which tells us how much water vapour there is in the air and helps forecasters to predict rain.
- Two thirds of the world's rain falls in the tropical climate zone, which, unsurprisingly, also has the highest level of humidity.

1 **Follow the instructions to observe the water cycle. Explain how you would test the effect of temperature on the water cycle. What might happen?**

2 **Explain how you would make sure your experiment was a 'fair test.'**

3 **What do you think will happen as the temperature increases?**

4 **Using your test method carry out the experiment and record your findings.**

5 **Draw your own diagram of the water cycle in the box below.**

6 **Use the key words underlined to add labels to your drawing.**

The water cycle is a continuous process powered by the sun, which heats our oceans, lakes and rivers, turning the water into water vapour by the process of evaporation. As the water vapour rises into the atmosphere, it cools and forms clouds by the process of condensation. The water vapour stays in the atmosphere until the clouds can't hold any more moisture and the water falls back to the ground as precipitation (rain, sleet, hail or snow) to refill our oceans, lakes and rivers.

EXPLORING PRESSURE

Changes in atmospheric pressure lead to changes in the weather. When the air pressure drops then stormy weather is on its way! Follow the instructions to make your own barometer, then use this worksheet to help you plan and record your weather research.

Air pressure is all around us, so it is fine to keep your barometer indoors. The important thing is to position it carefully where the scale can be read without moving it.

1 Draw a diagram of your barometer and label it to show what will happen as

A. the air pressure increases
B. the air pressure decreases

CLIMATE FACTS

- Thunder and lightning happen at the same time but we see the lightning first because light travels faster than sound.
- The temperature of a typical lightning bolt is four times hotter than the surface of the sun.
- The sound of thunder is made by the air expanding at supersonic speed as it is heated by lightning. If the lightning travels a long way, then the thunder sound will rumble and roll as the sound carries from one end of the lightning flash to the other.
- Thunder can be heard up to 20km away. You can work out how far away you are from the storm by counting the number of seconds it takes to hear the thunder after each lightning flash, where 3 seconds equals 1km.

A.

B.

2 **Decide how often (frequency) you will check your barometer and for how long (duration) you will continue to monitor air pressure changes. Draw a graph on which to plot each reading.**

3 **Remember to record any weather patterns you noticed when the pressure changed.**

EXPLORING TEMPERATURE

The temperature of any place is dependent on how much heat energy it absorbs from the sun. Follow the instructions to explore temperature changes using sand and water.

1 What do you think will happen to each tray when you move them into the sun or a warm place?

2 Use the space below to create a table to record the temperature each time you use the thermometer.

CLIMATE FACTS

- Wind increases heat loss, so being by the seaside is pleasant on a hot summer's day, but on a winter's day, this additional heat loss known as 'wind chill factor' can make you feel much colder than the thermometer suggests.
- The coldest temperature on earth was recorded in August 2010 at -94.7°C by a NASA satellite in Antarctica.
- Deserts occur wherever there is very little moisture in the air. The hottest deserts, like the Sahara are found in the Tropics where the sun's power is at its greatest.
- Rising temperatures due to global warming are causing extreme weather, sea level rises and increasing the world's greatest challenges e.g. poverty, hunger and peace.

EXPLORING CLIMATE CHANGE

According to climate scientists extreme weather is more likely to happen more often in the future. Work with a partner or in a small group to research and reflect on the local impact of these changes in climate:

1. **As the temperature of the Earth rises we will see fewer frosts and more heat waves. Think about what effects this may have on our way of life e.g. travel, food supplies and your local environment.**

2. **Heatwaves are usually accompanied by thunder storms and torrential rain. Identify areas at risk of flooding in your local area using www.checkmyfloodrisk.co.uk. What do you think will be the impact on the people and animals that live in the worst affected areas close to you?**