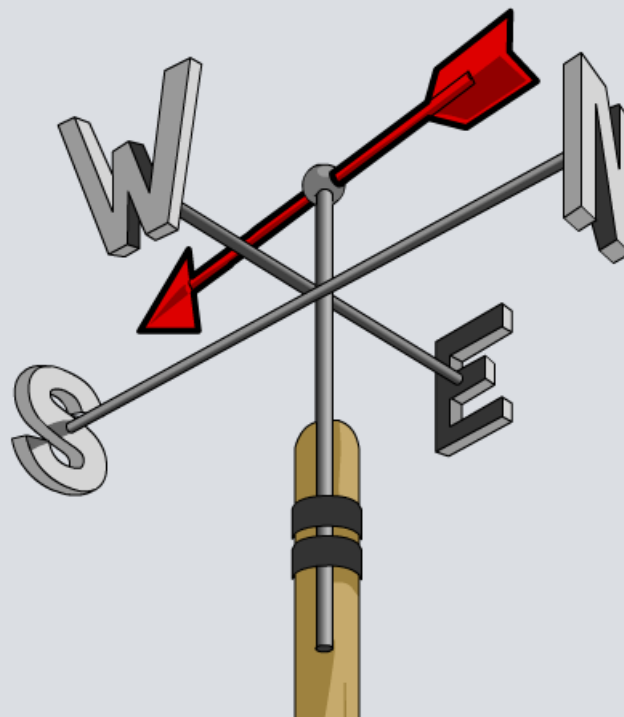


Measuring the Weather



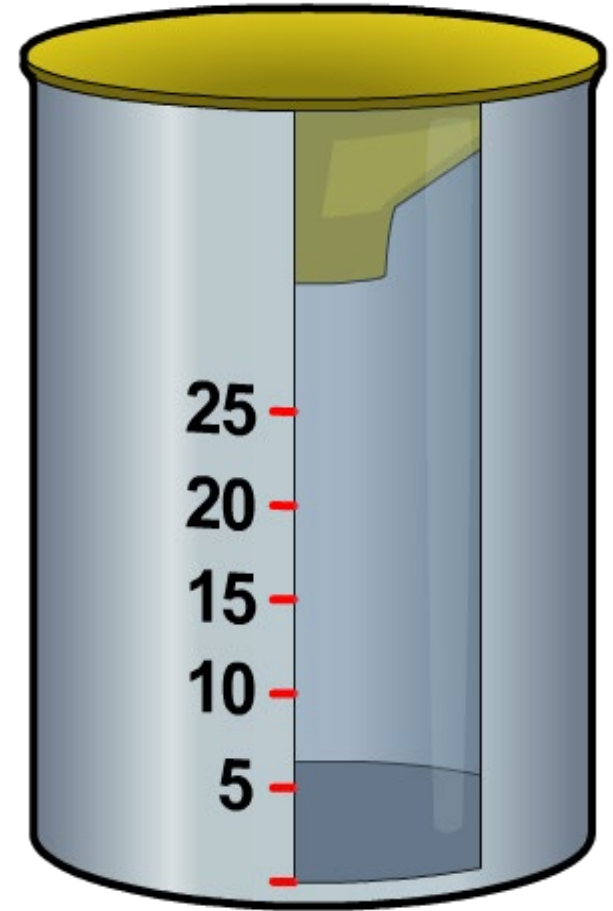
Rain is a type of **precipitation**.

Precipitation occurs when water vapor in the air cools and condenses into water droplets.

How is rainfall measured?

Rainfall is measured using a **rain gauge**.

Rainfall is usually measured in **millimeters** (mm).



Snow, sleet, hail, dew and fog are also types of precipitation.



Make your own rain gauge



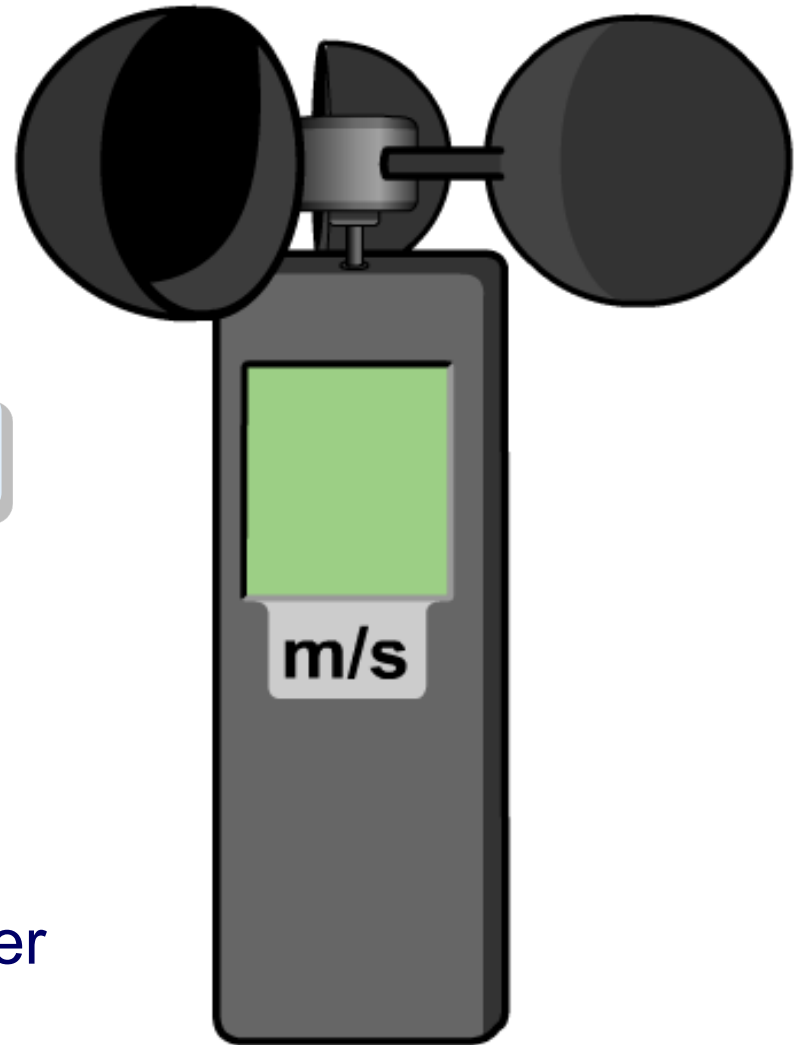
Wind is simply moving air.

Wind speed is a measure of how fast the air is moving.

How is wind speed measured?

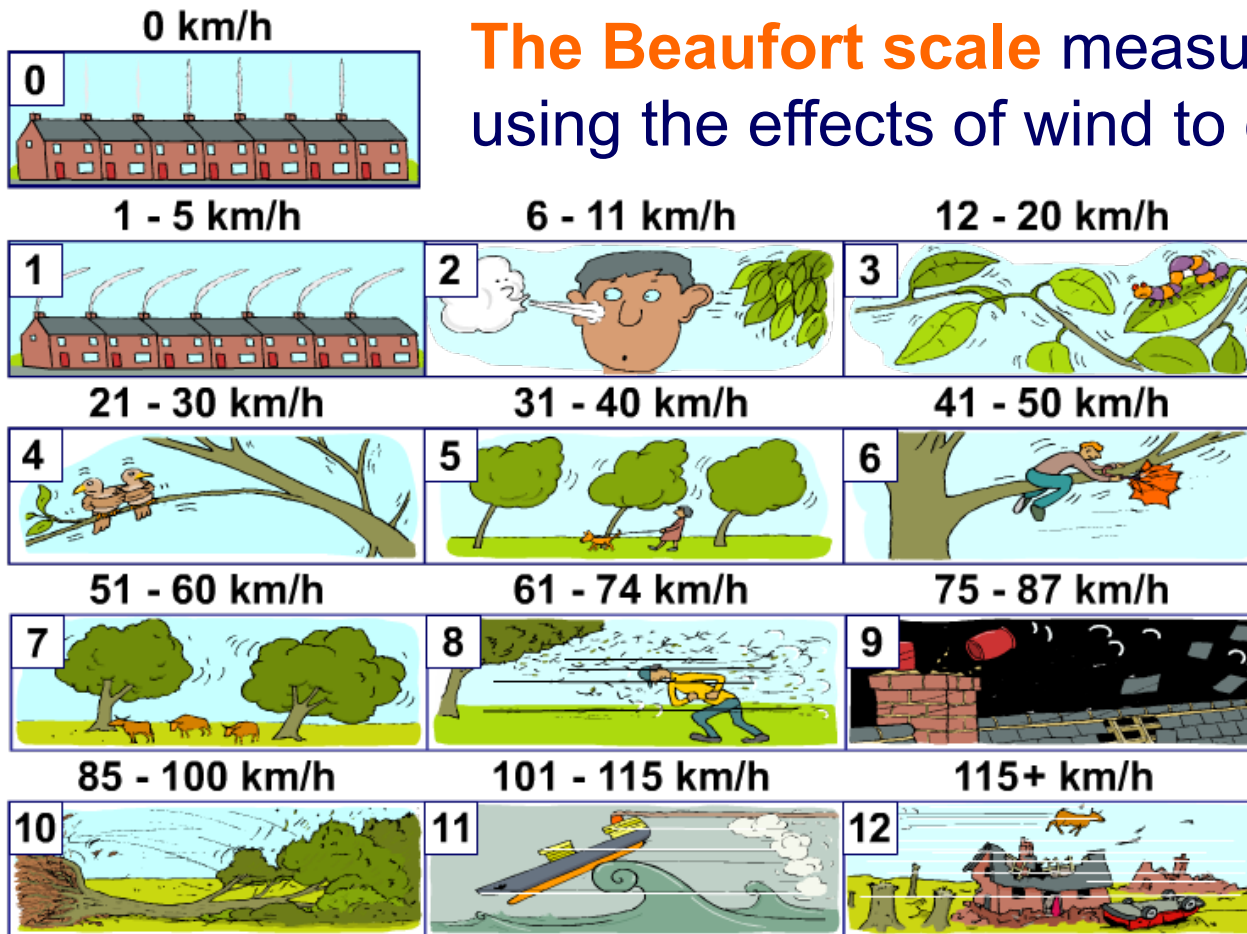
Wind speed is measured using an **anemometer**.

An anemometer has metal cups that rotate in the wind. The stronger the wind, the faster the cups turn.



How is wind speed estimated without an anemometer?

The **Beaufort scale** measures wind intensity using the effects of wind to estimate its speed.



It uses a scale from **0 to 12**.

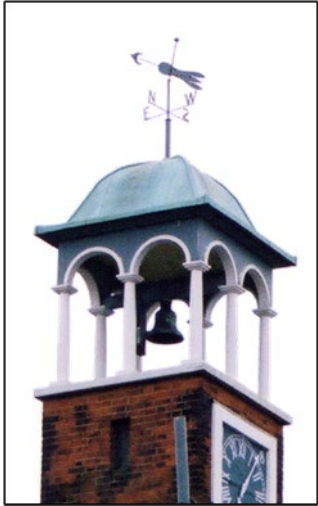
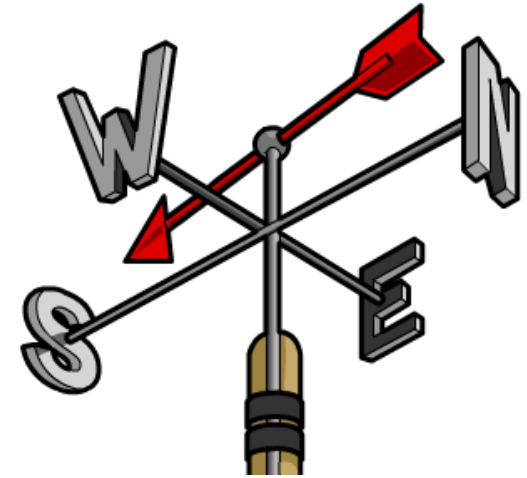
0 on the scale means there is **no wind**.

12 indicates **hurricane conditions**.

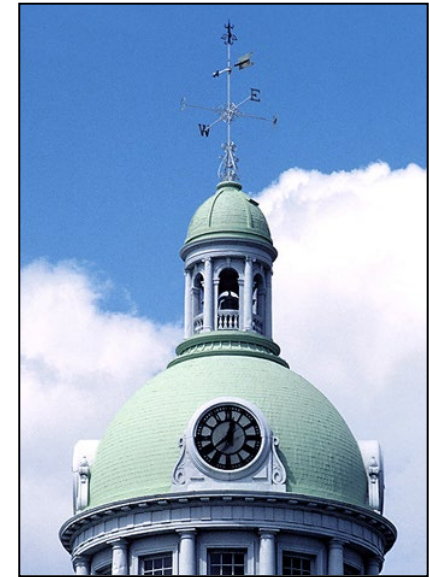
Wind direction

Wind direction can be found using a **weather vane**. The arrow or pointer turns to point into the wind.

This weather vane is pointing South, so a Southerly wind is blowing.



Can you spot a weather vane in your local area?



Air pressure is the force exerted on the Earth by the air above.

How is air pressure measured?

Air pressure is measured using a **barometer**.



Air pressure changes with height.

To see air pressure fall, take your barometer with you as you walk up a hill.

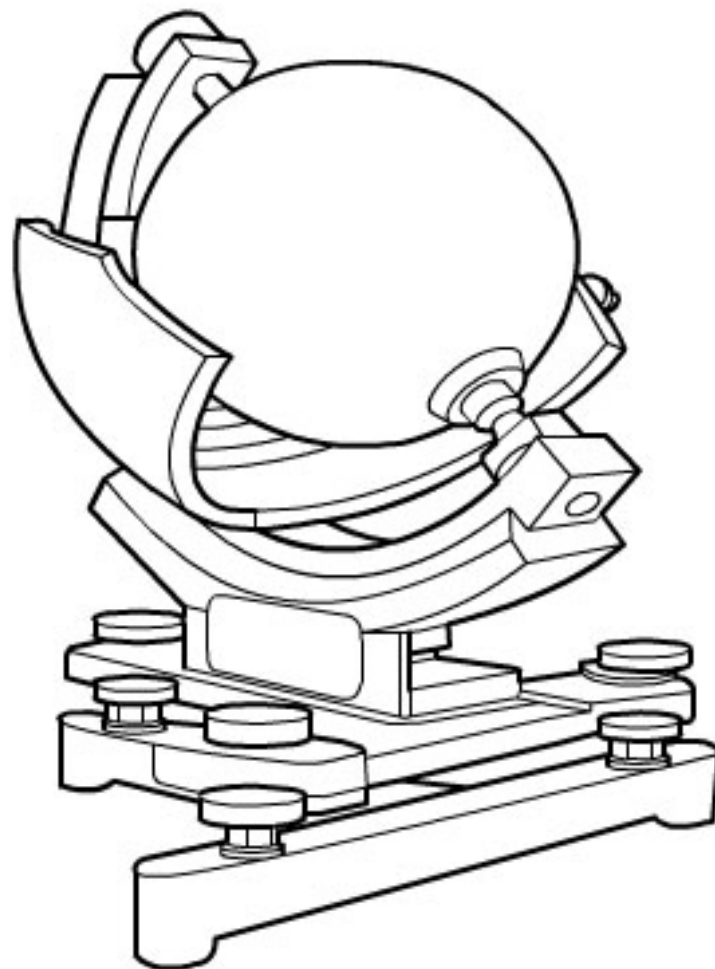


Sunlight is the amount of daylight.

How is sunlight measured?

The duration and the intensity of sunlight is measured using a **Campbell-Stokes sunshine recorder**.

The recorder focuses light from the sun onto a piece of card where it leaves a burned trace. The longer the sun shines, the longer the line.



Temperature is a measure of how warm or cool it is.

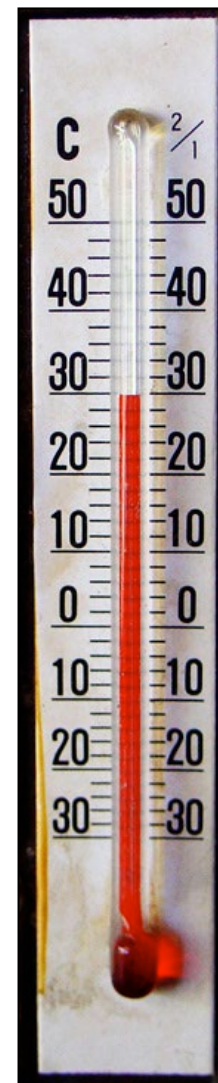
The units of temperature are **degrees Fahrenheit** ($^{\circ}\text{F}$) or **degrees Celsius** ($^{\circ}\text{C}$).

How is temperature measured?

Temperature is measured using a **thermometer**.

Temperatures are measured in the shade, so the sun's rays do not heat up the instrument being used.

Most thermometers are made so liquid (mercury or alcohol) in the bulb at the bottom expands as it gets warm and rises up a tube.



Weather station instruments



Virtual weather station



Most weather conditions can be measured using **sensors** as well as traditional weather instruments.

Sensors detect weather conditions and produce electronic information that is recorded by a **data logger**.

Automated weather stations can therefore measure, record and transmit weather data without a human inspecting the instruments.



Electronic weather stations are very useful because they can be located in hard to reach places.

