

## Activity Steps

### 01 What is a barometer and what does it measure?

A Barometer is an instrument that is used to measure the air pressure around us. Pressure is important as it can tell us about what kind of weather to expect; when the pressure is high, we can usually expect clear skies and light winds, when the pressure is low we can usually expect wet and windy weather. You can find more information on pressure here in this [video](#).

It's very important for some businesses, for example aeroplanes need to know exactly what the pressure is so they know what height to fly at, as they don't measure height above the surface in metres or miles, they use pressure levels. This [link](#) explains how important it is to know what the pressure is doing for Meteorologists and Met Office customers.

You may have seen an old-fashioned barometer at a museum or maybe someone in your family has one?

Ask your family if they have used or seen a barometer before.

Older barometers are very sensitive and need to be looked after to make sure they are still accurate, so most of the time now we use digital barometers as they are more reliable.

You are going to be making your own!

### 02 Make a barometer

Follow the instructions below to start making your own Barometer:

- Take a balloon and cut the neck of the balloon off.
- Take the bottom part of the balloon and stretch it over the rim of the jam jar. Younger children may need help with this. Make sure it's as tight as possible so that the balloon is flat.
- Secure the balloon over the jar with an elastic band or tape.
- Get a straw and cut it at an angle to create a point.
- Tape or glue the straw to the middle part of the balloon stretched over the jar.
- Get a piece of card and attach it to the wall. Place the jar next to it so the straw is close to the wall and aiming at the middle part of the paper.
- Mark where the straw is aiming on the paper.
- Make a mark 1cm above (label high and put a sunshine) and 1cm below (label low and draw some raindrops) the middle mark you have just drawn.
- Keep the Barometer in the same place, preferably away from strong sunlight and radiators, somewhere where the temperature is fairly constant.



### Tips

- Cutting the end of the straw to make a point will make it easier to see where the straw is pointing.

## 03 Record and observe

Step back and observe your Barometer over time.

Here are some questions below to think about as you're observing:

- Do you notice anything happening?
- Does it move a lot or a little?
- Can you tell when it was raining vs sunny?
- Why is this happening?
- Record what the weather is doing when it moves, is it raining? Is it dry?

### What is happening?

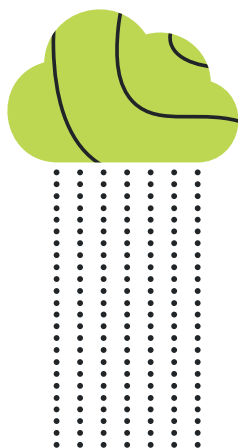
A barometer shows the relative difference in air pressure outside the barometer compared to inside. If you see something happening, this is because the air around us is made up of tiny particles called molecules. The air inside the jar has been trapped by the balloon so no molecules can escape but they press against the balloon and the sides of the jar. There is also air outside the jar, this air also contains molecules that push against the balloon from the other side.

If the pressure of the air outside the jar is higher than inside (high pressure), it will push down on the balloon and the balloon will sink and the straw will point upwards. If the air pressure outside the jar is lower than inside (low pressure), the balloon will swell outwards and the straw will start to point downwards.

The straw will move up or down slightly before the weather changes since a change in weather can typically coincide with a change in the atmospheric pressure.

### Pressure and seasons

High pressure in the summer often brings fine, warm weather. It can lead to long warm sunny days and prolonged dry periods but high pressure in the winter often leads to cold, dry days, with light winds. Severe nighttime frosts can develop if skies are clear.



Low pressure in the summer can lead to periods of prolonged rainfall, which in extreme situations leads to flooding. However, it is still possible to get nice weather in-between weather fronts, especially if the cloud clears and the Sun comes out. Low pressure in the winter often signals stormy or wintry conditions. More information on this can be found [here](#).

#### Tip

Think about how you could record your results – could you make a graph of each day to record where the straw is?

## 04 What can you do next?

If you would like to carry on experimenting with your Barometer think about answering the questions below:

- How well does your barometer work?
- What changes to the design would make it more accurate?
- Try using different size jars, a plastic jar, a metal jar, shorter or longer straws.
- How might changing temperature affect the accuracy of the barometer?

#### Tip

To find the pressure in your location go to [www.metoffice.gov.uk](http://www.metoffice.gov.uk) and type in your postcode. Find the tab “Last 24hrs” this will take you to the latest pressures recorded in your location. If you would like to find out more about the recording of pressure, you can find more reading [here](#).