

## Make a Barometer

We can measure changes in air pressure by making a barometer using a few simple pieces of equipment.

### You will need:

- a jam jar or straight-sided glass
- a long-necked bottle
- water mixed with food coloring
- a marker pen



Place the bottle upside down in the jar so that it is resting on the rim. The top of the bottle should be just above the bottom of the jar.



Remove the bottle and pour some colored water into the jar. You should use enough so that the water just covers the neck of the bottle when it is in place.

On the side of the jar, use the marker pen to mark the current level of the water in the bottle. Put your barometer in a place where the temperature is fairly constant.



Mark any changes in the water level over the next few weeks on the side of the jar.

**- When the water is high in the bottle, air pressure is high and the weather should stay fine.**

**- When the water is low in the bottle, air pressure is low and it will be stormy.**

## Make Your Own Barometer



### What you'll need:

- A balloon
- Scissors
- A jar
- A rubber band
- Tape
- A straw
- A piece of card
- A marker (felt pen)

### Instructions:

1. Cut the top off the balloon (the part which you blow into).
2. Stretch the balloon over the top of the jar and hold it in place with a rubber band.
3. Place the straw across the top of the jar so that one third of the straw is hanging over the edge. Stick the straw to the balloon with tape.
4. Draw three lines on the piece of card that are about half a centimeter apart from each other. Label these lines as high, moderate and low.
5. Tape the card against the back of the jar so that the straw points to moderate.
6. Put your barometer on a flat surface somewhere inside.

### What's happening?

When there is low air pressure the balloon should expand out and the straw will point down. This is because the air inside the balloon now has relatively more air pressure compared to the air outside, it pushes the balloon out as a result.

When there is high air pressure the air on the outside will push the balloon into the jar and the straw will point upwards. The air inside the balloon now has relatively less pressure, this pushes the balloon inwards as a result.

In general, high air pressure indicates fair weather while low air pressure indicates that bad weather is more likely. Although forecasting the weather isn't an exact science and can be very difficult at times, give it a go and see how accurate you are.


## Record Air Pressure

Once you have made a [barometer](#), you will need to record the changes in air pressure that it measures.

To do this, look at your barometer everyday and see whether the air pressure is low or high. Check the weather at the same time and use the two sets of information to build up a picture of the weather that follows a change in air pressure. To make recording easier, use symbols such as the ones below for different types of weather.



Enter the information in a table or notebook as demonstrated below. You can even print out this table and use it for your own records. Make sure you could draw it for yourself as well though!

WEEK: 24/7/00 - 30/7/00 (12am)		
Day	Pressure (up, steady or down)	Weather symbol
Eg:	Down	
<b>Monday</b>		
<b>Tuesday</b>		
<b>Wednesday</b>		
<b>Thursday</b>		
<b>Friday</b>		
<b>Saturday</b>		
<b>Sunday</b>		

With a bit of practice, you should be able to use your barometer to predict the weather.

Air pressure can also be demonstrated using a **balloon**.

Think about when you blow up a balloon. When the balloon is being inflated, a lot of air is being forced inside it. This air is being compressed as it is squashed together, and so it is at high pressure. If you let go of the end of the balloon, the air inside will rush out to where the pressure is lower.

## Weighing the Air

We know that there is a blanket of air around the Earth called the atmosphere and that this results in what we call air pressure. But how can we actually prove that air has weight? Isn't it just an invisible mixture of gases that we need to breathe? Let me show you.

The air in the atmosphere is kept close to the Earth by the pull of gravity, the force that pulls everything – including you and I – down to the ground. Without gravity, we would be weightless and would float above the ground, as we see with astronauts in space. As well as giving humans weight, gravity also does the same for air.



We can illustrate this with a simple experiment using two balloons. We want to test whether the balloon is heavier or lighter (or the same weight) after you blow air into it. To do this, tie a piece of string around the middle of a stick of piece of cane so that it balances. Then tie an empty balloon to each end of the cane. **What happens?** The two balloons should balance evenly at each end.

Now remove one balloon and blow air into it. When you have done that, tie it back onto the end of the cane. **Is there any change?** That's right, the end with the blown-up balloon on it should dip downwards. This is because the air in the balloon is making it heavier.

