



Under pressure? We are all constantly under a certain type of pressure. Make your own barometer and measure atmospheric pressure!

The sensors in the glasshouses collect information on air pressure. Children can make their own air pressure sensor. To show how air pressure is typically measured children can make a barometer and measure air pressure themselves.

Class Standard	3 rd -6 th Class
Subject	Atmospheric Pressure
Strand	Natural Environments (Geography)
Strand Unit	Weather, climate and atmosphere

Introduction:

A barometer is an instrument that measures atmospheric pressure. The classic mercury barometer is typically a glass tube about 3 feet high with one end open and the other end sealed (like a giant test-tube). The tube is filled with mercury and sits upside down in a container of mercury called a reservoir. As the atmospheric pressure changes, the level of mercury in the inverted glass tube rises and falls. If the pressure is high, mercury is pushed further up the tube. If the pressure is low, the mercury level falls. The first barometer of this type was devised by Evangelista Torricelli in 1643. With this new device people could predict the weather more accurately. Today mercury barometers are no longer sold, as mercury is poisonous. However, there are other types of barometer such as the aneroid barometer that contain no liquid. These are commonly used in portable instruments and aircraft altimeters because they can be quite small and compact.

What do you need?

- Clear glass bottle or jar (plastic is too flexible)
- Water
- Food colouring
- A clear plastic drinking straw
- Modelling clay

What to do:

- 1) Begin with a discussion on weather and air pressure so that the children can express their ideas and then test them by doing this activity.

- 2) Set up the equipment as in figure 1. Fill the bottle two thirds full with water and add food colouring.
- 3) Insert the straw part way into the bottle, making sure that the end of the straw is below the water level.
- 4) Seal the neck of the bottle around the straw with modelling clay. N.B Make sure there are no gaps where air could escape
- 5) Mark the water level in the straw either on the bottle or on the straw. Observe the level over a number of days to see how it changes. Record the weather conditions outside on each of the days that the barometer is observed.
- 6) When the air pressure outside the bottle decreases, the trapped air inside the bottle will make the water level in the straw fall. If you see this, watch for stormy weather. If the pressure outside the bottle increases, it will push the water further up in the straw, meaning fair weather ahead.



Figure 1

To do at home:

Ask the children to watch the weather forecast to see if high or low pressure is due for the following morning. The next day, check the barometers and see if the forecast was correct.

Investigate:

- 1) Draw and label a picture of the barometer that you made.
- 2) Fill in the table below

Day	What did you notice about the water level of the straw today?	Do you think air pressure is higher or lower than yesterday?
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

What's going on?

The air around us is made up of lots of gases. These gases press down on the Earth's surface, applying a force that we call air pressure.

Air pressure can be either high or low. When we go up to the top of a mountain, the air pressure is a lot lower than at ground level. This is why it's harder to breathe at the top of a mountain.

Air pressure affects the weather. High pressure usually brings nice weather. Low air pressure usually brings bad weather.

A barometer is a tool that measures air pressure. Look at your barometer. When the level of water in the straw rises, air pressure is high. When the level of water in the straw falls, air pressure is low.

