

LET'S BUILD A BAROMETER to observe changes in atmospheric pressure

Every year, millions of people find themselves in danger due to weather events of unprecedented intensity: floods, hurricanes, droughts, heat waves, and cold spells with extreme temperature peaks. These are the effects of the rapid climate change that has been taking place on the planet for several decades, which is harmful from both an economic and ecological point of view.

Objectives:

- Learn about the main factors that influence climate and weather and their effects;
- Build tools for studying certain meteorological phenomena;
- Creatively use waste materials and activate operational and manual skills;
- Observe local variations in certain meteorological factors;
- Relate the observations made to what is happening on a larger scale.

Prior knowledge:

- Know that weather forecasts, which are now produced by satellites, computers, and other instruments based on mathematical, physical, and statistical models, were once made through a network of weather stations;
- Understand the principles behind instruments such as thermometers, barometers, and anemometers.
- Understand the difference between climate and weather.
- Understand what is meant by "climate change."

Before starting the experiment, tell the students to write down the entire process, from the materials needed to the execution and results.

Materials needed: a glass jar, an inflatable balloon, a wooden stick, a rubber band, a toothpick, a piece of cardboard, double-sided tape, a pair of scissors.

How to make it:

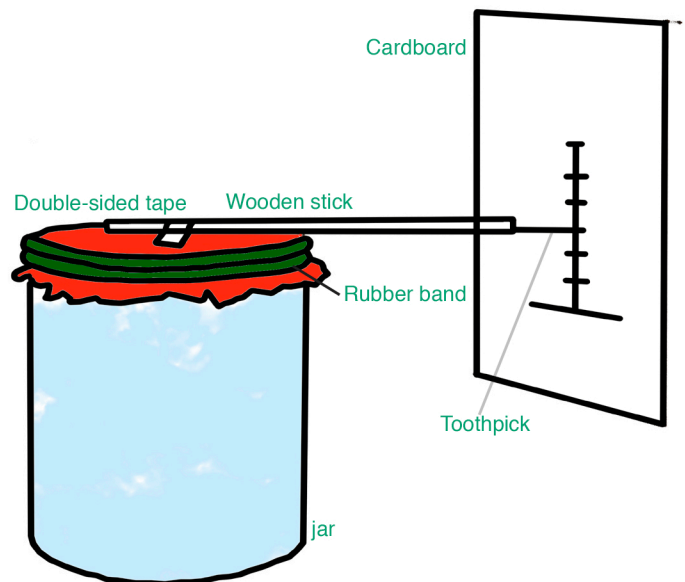
Cut the balloon and stretch it over the opening of the jar so that it forms a membrane covering the mouth. Secure everything with the rubber band. Attach the toothpick to one end of the stick and glue the other end to the center of the membrane with double-sided tape. Place the graph paper, on which you have previously drawn marks at regular intervals of about 3 mm, at the point indicated by the toothpick, and highlight it with a marker pen as it represents the reference level.

Ask the children: what have we done?

A: the air has been 'trapped' in the jar and, because it is hermetically sealed, it will retain the atmospheric pressure at the moment we carried out the experiment. Observe what happens when the jar is left in the sun, placed in the refrigerator, or what happens in the following days.

The following may occur:

- **The index marked by the toothpick lowers:** the external atmospheric pressure **decreases** compared to that of the air trapped in the jar, i.e., the pressure of the air inside the jar pushes the membrane upward and the toothpick lowers.
- **The index marked by the toothpick rises:** the external atmospheric pressure **increases** compared to that of the air trapped in the jar, i.e., the pressure outside the jar pushes the membrane down and the toothpick rises.



WARNING!

This experiment uses an inflatable balloon of the type commonly purchased for parties and public or private celebrations. Remind the children to avoid buying them because they are highly polluting and, in any case, to dispose of them properly. When filled with helium and released into the air, they break, fall to the ground or into the sea, and cause serious damage to animals and plants.