

Weather Scope

Make and Use a Barometer to Measure Air Pressure

Overview

Air pressure is the result of the weight of tiny particles of air (*air molecules*) pushing down on an area. While invisible to the naked eye (i.e. microscopic), they nevertheless take up space and have weight. For example, take a deep breath while holding your hand on your ribs and observe what happens. Did you feel your chest expand? Why did it expand?

Air pressure expands because the air molecules take up space in your lungs, causing your chest to expand. Furthermore, air can be compressed to fit in a smaller volume since there's a lot of *empty* space between the air molecules. When compressed, air is placed under high pressure. Meteorologists measure these changes in the air to forecast weather, and the tool they use is a **barometer**. The common units of measurement that barometers use are *millibars* (mb) or *inches of mercury*.

Make a Barometer



(if you already have a barometer, you can skip to the [Use a Barometer to measure Air Pressure](#))




A. Materials

- wide-mouthed glass jar or small coffee can
- balloon (recommended) or plastic wrap
- rubber band
- scissors
- drinking straw
- cardboard strip
- glue (recommended) or tape
- ruler and pen or pencil
- small piece of modeling clay
- shoe-box sized cardboard box



B. Procedure

1. Cut the narrow opening of the balloon off.	
2. Cover the top of the jar with the balloon so that it is airtight and use the rubber band to hold it in place. IMPORTANT: the seal should be airtight (If you are using plastic wrap, it should make an airtight seal around the rim of the jar).	
3. Place a small amount of glue in the middle of the balloon and carefully place the side of one end of the straw on the glue so that the other side extends over the edge of the jar.	

	
<p>4. While the glue is drying, fold a piece of cardboard (see photo) so that it can stand on its own.</p>	
<p>5. Carefully, mark lines .5 cm apart and write "Low Pressure" at the bottom and "High Pressure" at the top.</p>	
<p>6. Once completed, place the barometer and the scale in the shoe-box sized cardboard box so that the end of the straw with the clay just reaches without touching the scale. Tape both the barometer and the scale into place so they cannot move.</p>	

C. How does this measure air pressure?

High pressure will make the balloon seal dip causing the straw to go up. Low pressure will make the balloon puff up causing the straw to go down.

Use a Barometer to measure Air Pressure

A. Materials

- o Barometer

B. Procedure

1. Place the completed barometer and scale in a shaded location free from temperature changes (i.e. not near a window as sunlight will adversely affect the barometer's results).
2. In your notebook or the table below, record the current date, time, the weather conditions, and air pressure (i.e. the level where the end of the straw measures on the scale).
3. Continue checking the barometer twice a day (if possible) each day over a period of several weeks.

Data Table

Date	Time	Weather Conditions	Air Pressure

Sample Data Table

Date	Time	Weather Conditions	Air Pressure
June 4, 2003	9:30 am	Clear and Sunny	4
June 4, 2003	2:30 pm	Cloudy	3
June 5,	9:30 am	Rainy	1