

Barometer Lab

Background Information: Air pressure is the result of weight of tiny particles of air (air molecules) pushing down on an area. While air pressure is invisible to our eyes (because it is 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. Do you feel your chest expand? Why did it expand?

The air molecules that you breathe in take up space, which cause 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.

You will work as a lab group to construct a barometer that will be used to take atmospheric pressure measurements over an extended period of time in our classroom environment.

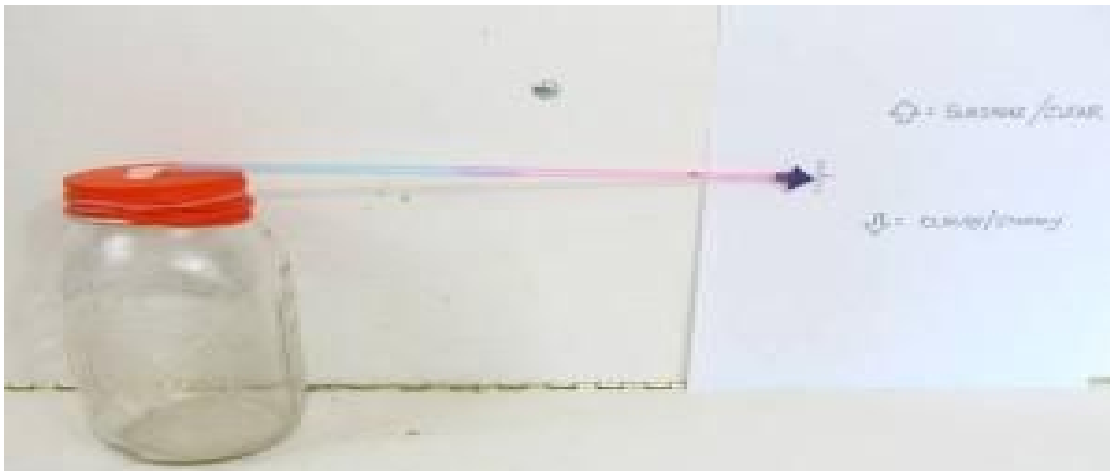
Problem: How does the air pressure change in our classroom on a cloudy day compared to a sunny day?

Hypothesis: If it is sunny, then the air pressure will be _____ and if it is cloudy, then the air pressure will be _____.




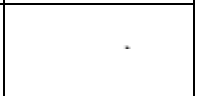


Variables: Identify the independent variable, dependent variable and constants in this experiment.

Materials:

- Glass jar
- Balloon
- Rubber band
- Scissors
- Straw
- Cardboard strip
- Glue or tape
- Ruler
- Pen or pencil



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!	
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.	
4. While the glue is drying, cut out a small arrow/pointer to fit inside the end of the straw.	
5. Carefully, mark lines .5 cm apart on the inside cover of the paper and write "Low Pressure/Cloudy/Stormy" at the bottom and "High Pressure/Sunshine/Clear" at the top.	
6. Once completed, place the barometer next to the paper so that the end of the straw with the pointer just reaches without touching the scale on the paper. Tape the paper into place so it cannot move in the desired location.	

Observations: Please record the date and time in which you observe your barometer as well as the weather conditions (sunny, rainy, cloudy, foggy, etc) and the air pressure (high or low).

Date	Time	Weather Conditions	Air Pressure

Analysis: Use your date table to describe what happened over the course of your experiment.

Conclusion:

1. How does your homemade barometer measure air pressure?
2. How could your barometer be used to predict possible upcoming weather conditions?
3. Why don't we get crushed by air pressure?

4. Based on your analysis, has your hypothesis been accepted or rejected and why?