



Air Pressure

Kevin Kemp
St. Labre Indian School
Ashland, MT

Research Hosts:

Gregory Florant, Ph.D.
Matthew Hickey, Ph.D.
Colorado State University, Fort Collins, CO

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Grade Level:

Middle School-High School

Air Pressure

Purpose:

Illustrate the force of the Earth's atmosphere and whether air weighs anything.

Objectives:

Students will be able to:

- know the effects of air pressure on objects.
- to determine if air weighs anything.

Materials:

- clear plastic container deep enough to cover plastic cups.
- clear drinking cups
- metric ruler
- small pieces of cork

Preparation:

1. Have students write down and answer the following questions:
 - What do you think will happen when you lower the opened end of the cup over a piece of cork in a container $\frac{1}{4}$ full of water?
 - What do you think will happen when you lower the opened end of the cup over a piece of cork in a container $\frac{1}{2}$ full of water?
 - What do you think will happen when you lower the opened end of the cup over a piece of cork in a container $\frac{3}{4}$ full of water?
 - What do you think will happen when you lower the opened end of the cup over a piece of cork in a container full of water?
2. Break students into groups of two or three and have them write down what each of group member thinks, and why they feel that way.

Procedure:

1. Have one student go and get cork, cup, and ruler while other student goes and fills up the container to the $\frac{1}{4}$ mark already made on the container.
2. After students have gathered all the necessary equipment they should place the cup, mouth downward, over the piece of cork in the water and record results.
3. The students should then remove the cork and cup and fill container to the $\frac{1}{2}$ full mark on the container. They should then place the cup, mouth downward, over the piece of cork in the water and record results.
4. The students should then remove the cork and cup and fill container to the $\frac{3}{4}$ full mark on the container. They should then place the cup, mouth downward, over the piece of cork in the water and record results.
5. The students should then remove the cork and cup and fill container to the full mark on the container. They should then place the cup, mouth downward, over the piece of cork in the water and record results.
6. Students should place materials back where they are stored and dry and clean the area in which they worked.

7. Have students return to seats and have them compare their results with their predictions and write down any discrepancies.

Questions to Ask:

1. What happened to the cork with the container $\frac{1}{4}$ full, $\frac{1}{2}$ full, $\frac{3}{4}$ full, and full?
2. What caused this to happen?
3. Does air weigh anything?
4. If air does weigh something how can we measure it?
5. What would this device be called?
6. What effect does this have on people?
7. What would happen if the cup was filled with water at the same container levels?

Where to Go from Here:

Perform the experiment where the cup is filled with water and the cork is in it.

This lab was designed for a meteorology unit for 8th graders, but can be used for physics applications in a physical science or physics class.

References:

Adapted from the weather channel web page for teachers:

<http://www.weather.com/education>