

Title: Under Pressure

Subject: Science

Skills: predicting, observing, drawing conclusions

Grade Level: 2-6

Length of Lesson: 30 minutes for set up, ongoing observations

Overview: Students will build their own barometers and use them to predict weather.

Background information: Air pressure is the amount of pressure exerted on the ground from the air. Cool air is heavier and presses down on the earth. This means there is high pressure over the area. It usually indicates fair weather. Warm air rises from the earth, therefore having less pressure on the earth. When air pressure is dropping from high to low, it usually indicates stormy weather approaching.

Materials (per group):

Clean empty soup can

Balloon

Straw

Toothpick

Tape

Oaktag or poster board

Under Pressure-Make your own barometer worksheet

Under Pressure-Data Sheet

Teaching the Lesson:

1. Ask student if they feel any air pressing on them in the classroom. Tell them there is air pressing on everything in the room- this is called air pressure. The reason we don't feel it is because it presses evenly all around us.
2. Show them what air pressure looks like, by blowing up a balloon. The air pressing on the inside of the balloon is trapped, and therefore we can see its affect on the balloon.
3. Tell students that there is air pressure all over the earth. The pressure can be high or low, and is always changing. When the air is warm, it rises (have them think of how a hot air balloon works), and therefore pressure is low over that area. When the air is cool, it falls, and therefore creates greater pressure on the area. When these changes happen over large areas, it affects the weather. Clouds are unable to form, and this keeps the weather calm.
4. The students will now make their own barometers. Older students can follow the Under Pressure-Make your own Barometer worksheet directions. Younger students may need assistance.
5. Follow the directions on the worksheet, and assemble the barometers.

6. Students should now set their barometers in an accessible location, and begin to track the weather, and record the reaction of the barometer.
7. At the end of the two week period (greater or less time may be necessary) students should be able to conclude that when their barometers indicate high pressure, the weather is fair, and when it is falling, weather is stormy.

Evaluation:

Worksheet can be used to evaluate students' understanding of barometric pressure and weather. In addition, they could be assigned to watch the local weather report each night, and record what the weather person reports. They should then note the weather that follows.

Under Pressure Make a Barometer

You can make your own barometer using a balloon and a can! Follow these simple directions and you'll be predicting the weather.

Materials:

Clean, empty soup can (be careful of sharp edges-masking tape around the edge will help)
balloon, with the neck cut off
rubberband
Drinking straw (about 6 inches long)
Tooth pick
Tape
Poster board (slightly taller than your can)

Make it:

1. Slip the balloon over the top of your can. You may need a partner to help you with this step. Place the rubber band around the can and balloon, to help hold it in place if needed.
2. Tape the toothpick to the end of your drinking straw, so that it extends passed the end of the straw about an inch.
3. Tape end of the drinking straw (without the toothpick) to the center of the balloon.
4. Place your barometer with your poster board next to it on a level surface. If you fold the poster board like a greeting card it will stand up next to the barometer. Make sure you put the barometer and poster board in a place where they will not be disturbed. Mark the poster board where the toothpick ends with a small dash.

Use it:

1. Check your barometer each morning and afternoon, and place a dash mark next to the tooth pick each time. After one week, mark your lowest mark "low", and your highest mark "high".
2. For the next week, watch your barometer, and record its location (high, low, unchanged) and the weather on your chart.

How it works:

When air warms up, it rises. This takes pressure off the top of your balloon, so the air inside the can will rise up. As the balloon goes up, the toothpick points down-indicating low pressure. The opposite is true for high pressure. When the air cools, the air sinks down on top of your balloon, making more air pressure on the top. This causes your toothpick to point up.



Under Pressure Data Sheet

Use this data sheet to track your barometer and the weather

Day	Barometer (high, low, unchanged)	Weather
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

What did you learn?

1. What kind of weather did you see out your window when the air pressure was high?

2. What kind of weather did you see out your window when the pressure was low?-

3. What happened when your barometer didn't change?

4. How can you use your barometer to predict the weather?

5. Why would a farmer need to be aware of the air pressure readings in her state?
