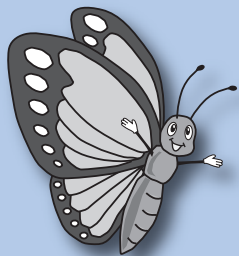


The Weight of Air

ACTIVITY 3



Learning Objectives:

- Visually demonstrate that air has weight and takes up space.

Subjects

- Science
- Math

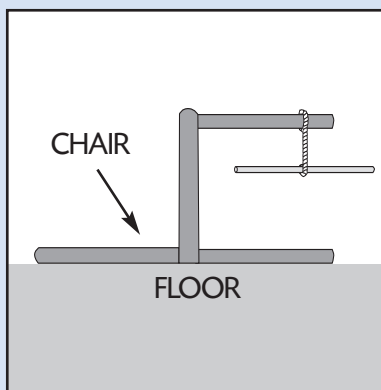
Materials

- Wood dowel (about 15 inches)
- 3 pieces of string (6 to 7 inches long)
- 2 balloons
- Pin (or a pair of scissors)
- The Weight of Air student worksheet

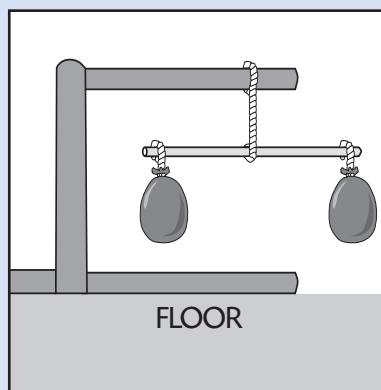
Teacher's Background Information

NOTE: If students have not completed activities *Where's the Air?* or *Air Soup*, the teacher may want to explain how we can feel air and what air is made up of.

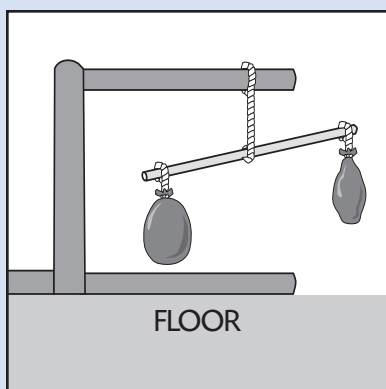
If you think the students can think up their own experiment given the materials above, let them design their own experiment. If not, you may want to provide them with the following instructions to create their own balance scale with a wooden dowel and some balloons filled with air.



Tie one string tightly to the middle of the dowel. Using the other end of the string, hang up the dowel from a chair or something else in the room so that it is hanging freely. Slide the string along the dowel until it is balanced.



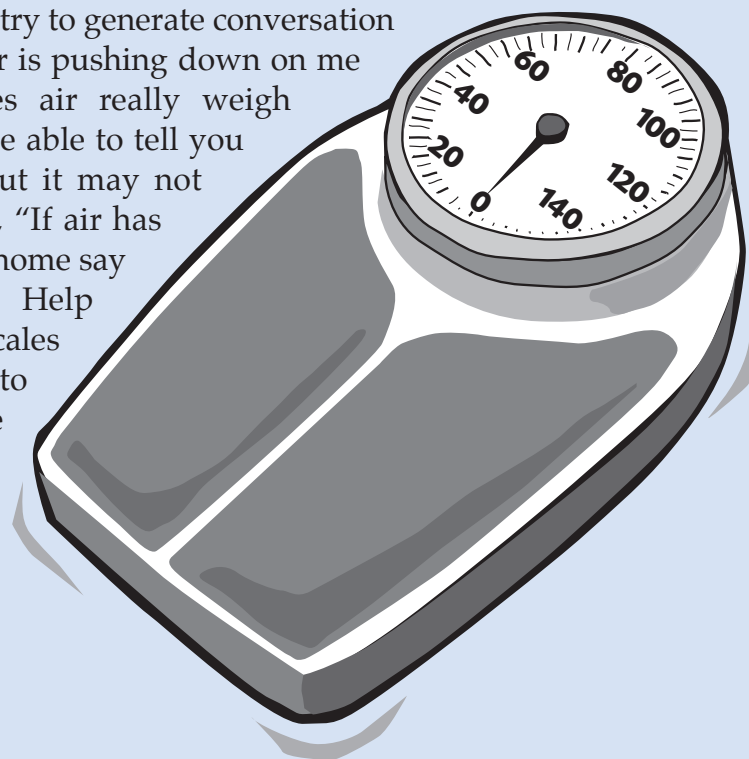
Blow up a balloon and tie it shut. Tie the balloon tightly with the second piece of string. Do the same with the other balloon and piece of string. Tie one balloon to one end of the balancing dowel and the other balloon to the other side of the dowel. Slide the strings back and forth until they are balanced.



Now, let the air out of one of the balloons by carefully puncturing it with a pin near the tie on the balloon. (The balloon should not burst! Allow the air to seep out.) If the pin hole is not large enough, puncture it a few more times so the air starts to leak or try putting a very tiny slit near the tie of the balloon with a pair of scissors.

Remind students that both of the balloons balancing on the dowel have air inside of them. After puncturing one balloon, have the students observe what happens. The air rushes out of the balloon making the dowel off balance. The balloon still filled with air sinks and shows the students that it weighs more – air has weight.

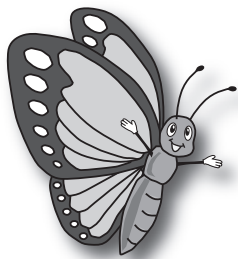
Once this conclusion is found, try to generate conversation by asking, “I don’t feel like air is pushing down on me when I stand here. So does air really weigh anything?” Students should be able to tell you that air does have weight, but it may not weigh a lot. You can also ask, “If air has weight, why does my scale at home say zero before I step on it?” Help students to understand that scales can be calibrated and adjusted to weigh only your weight or the weight of the object that is placed on it, not the weight of the air that rests on it.



Remember:

- Teachers, please remember to post or make available the **bold-faced** vocabulary word definitions in each activity (*see the glossary on page 65 for definitions*).

The Weight of Air



Now we know air is made up of a bunch of different gases like **oxygen** and **nitrogen** and we can actually feel air, but does it weigh anything?

Ok, here is your mission...

- Answer the question – *Does air have weight?*
- Use some or all the materials listed in the box to design an experiment to test if air has weight.

Materials:

- 2 balloons
- 3 pieces of string
- Wooden dowel
- Pin or scissors

Experiment Questions:

1. Describe the experiment you came up with.
2. What was the result, does air have weight? How do you know?

