



Teacher Guide

Weighing Air

Key idea: Air seems weightless, but it actually has weight.

Time: 10 minutes

Objective

Students try to balance two deflated balloons taped to the ends of a meter stick. Then they try to balance one blown-up balloon and one deflated balloon. They apply their observations to understanding that air has weight.

Do the activity

Divide students into small groups. Give them the *Weighing Air* Student Handout and have them do the activity and answer the questions.

First students will tape a deflated balloon to each end of a meter stick or yardstick, as shown in the diagram. A student will try to balance the meter stick on one finger. The group will observe and describe what happens.

Then students will remove one of the balloons from the meter stick. A student will blow up the balloon and tie the opening shut. Students will tape the blown-up balloon to the same end of the meter stick. A deflated balloon should still be attached to the other end of the meter stick. Again, a student will try to balance the meter stick on one finger, and the group will observe and describe what happens, and why.

Answer Key

Interpret your results

1. Was there a difference in what happened when you tried to balance the meter stick with two deflated balloons and when you tried to balance it with one deflated balloon and one blown-up balloon? If so, what was the difference? *[Sample answer: There was a difference in the two trials. When both balloons were deflated, I could easily balance the meter stick by putting my finger right in the middle. When one balloon was blown up, that side of the stick tipped down, and I had to move my finger closer to the blown-up balloon in order to balance the meter stick.]*
2. Does this activity provide evidence that air has weight? If so, explain the evidence. *[Sample answer: The activity does provide evidence that air has weight. The meter stick with two deflated balloons balanced evenly because the balloons were about the same weight. When I squeezed air into one balloon by blowing it up, the air made that balloon heavier so that it weighed down one end of the meter stick. That showed that the air inside the balloon had weight. That makes sense, since air is made up of gas molecules such as oxygen, nitrogen, and carbon dioxide, which individually and together have mass.]*

STANDARDS ALIGNMENT

NGSS MS-PS1.A: Structures and Properties of Matter: Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means.

CCSS RTS.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

W.6-8.1: Write arguments to support claims with clear reasons and relevant evidence.

MATERIALS

For each group of students:

- > 2 balloons (both the same size)
- > Meter stick or yardstick
- > Clear tape

