

CLE 3321.2.4 Investigate characteristics associated with the gaseous state.

SPI 3221.2.7 Predict how changes in volume, temperature, and pressure affect the behavior of a gas.

Boyle's Law Activity

This simple activity is an excellent way to introduce students to the relationship between pressure and volume of an enclosed gas. Although students do not collect quantitative data, they are able to discover that pressure and volume are inversely related.

Materials needed either per student or pair of students:

- 60 mL syringe with Luer Lock tip
- syringe tip caps
- miniature marshmallow

Note: syringes and tips can be purchased from Flinn Scientific. Syringes without caps may also be used.

Directions:

1. Place a miniature marshmallow inside syringe.
2. Move plunger to about 30 mL.
3. Put cap on tip (or hold finger over end) so no air can escape.
4. Experiment by moving the plunger back and forth, increasing and decreasing volume of container. Observe what happens to the marshmallow.

Discussion:

As the volume of the container decreased what happened to the pressure exerted by the air? How did that affect the marshmallow?

As the volume of the container increased what happened to the pressure exerted by the air? How did that affect the marshmallow?

Did the temperature of the air change?

Use kinetic molecular theory to explain how the air particles exerted pressure on the marshmallow.

Testimonial: After we did this activity, one student remarked, "I can't believe how much fun something this simple is!"