



Curiosity Guide #410

Matter

Accompanies Curious Crew, Season 4, Episode 10 (#410)

Bottle Compression

Investigation #8

Description

Astound your friend and make the invisible visible!

Materials

- Empty plastic water bottle with cap
- Rubbing alcohol
- A friend

Procedure

1. Ask your friend what is in the open bottle.
2. Pour about two tablespoons of rubbing alcohol into the bottle.
3. Slowly tilt and twirl the bottle to coat as much of the inner surface of the bottle as possible.
4. Put the cap on the bottle.
5. Grab the base of the bottle in one hand and repeatedly twist the upper half of the bottle.
6. Quickly unscrew the cap.
7. What do you notice?

My Results

Explanation

At the beginning of your investigation, the empty bottle has gas particles inside. Adding a small amount of quickly-evaporating rubbing alcohol increases the concentration of gas particles in the bottle.

Gases are the only type of matter that can be significantly compressed. Twisting the bottle increases the pressure in the bottle, which also increases both the movement of the gas particles and the temperature. Removing the cap causes both the pressure and temperature to quickly drop. This causes the gas particles to condense and form a visible cloud.

Think about this: Gases particles are constantly in motion. Gas particles move much faster than the particles in solids or liquids. And gas particles are much further apart, so walking through these gas particles is very easy. Now if we could see those gas particles, we would see how the particles just keep moving in straight lines until they bump into something else and change direction. Collectively, gas particles will bounce around and fill up available spaces, like the surface of the Earth, your room, or even an empty bottle.

Parents and Educators: use **#CuriousCrew**
#CuriosityGuide to share what your Curious Crew
learned!



Curious Crew is a production of Michigan State University.

Learn more at WKAR.org.

© MSU Board of Trustees. All rights reserved.