



Curiosity Guide #410

Matter

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

Cloudy Bottle

Investigation #7

Description

Capture some clouds in a bottle and find out how they form!

Materials

- Empty plastic water bottle
- 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 try to coat as much of the inner surface of the bottle as possible.
4. Cap 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

Gases will proportionately fill up the space in an open container, and we can't see them. At the beginning, the bottle was filled with gas molecules that quickly moved past one another, colliding with each other and with the inside of the bottle. Adding air into the bottle with the pump increases the temperature and pressure inside the bottle and causes the molecules to move even more quickly. When the stopper is removed, the quick reduction in pressure lowers the temperature, slows the molecules down, and allows the molecules to condense and form tiny visible droplets. Although the experiment can be done with water, the rubbing alcohol evaporates more quickly and provides more gas molecules to condense than water does. This makes the action easier to see. In our atmosphere, warm air rises but experiences less pressure. So, the temperature cools and allows the water vapor to condense and cling to particles in the air. This makes visible clouds.

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