

# Cloud in a Bottle

## **The Action**

A cloud forms in a 2-Litre pop bottle when pressure is applied to the bottle.

## **Grade Level**

Grade 10 - Physical Science

Grade 9 - Atmosphere

## **Materials**

- Colorless 2-Litre pop bottle and cap
- Hot water
- Sheet of black paper
- Matches

## **Instructions**

- Pour about 4 cm of very hot tap water in a 2-Litre pop bottle. Place your mouth over the opening and blow into the bottle to ensure that the bottle is fully expanded and immediately seal the bottle.
- Vigorously shake the bottle for about a minute. Light the match, let it burn for a couple of seconds, drop it in the bottle and recap quickly.
- Place the bottle upright with the black paper as a background and squeeze the bottle firmly for 5 to 10 seconds. Release the pressure and the cloud forms in the bottle.
- Once the cloud has formed, quickly uncap the bottle and the cloud will escape. The demonstration can be repeated.

## **Safety**

Matches must be used safely. No flammable materials should be lying around the demonstration.

## **Hints**

- The black paper as background makes the cloud more visible. If the cloud does not escape after the cap is released, give the bottle a squeeze.
- If you do not have the strength to squeeze the bottle lay it on its side on top of the black paper and press the bottle with your hands. The cloud will be harder for students to see from their desks but much more pressure can be put on the bottle.
- Do not extinguish the match before dropping it in the bottle; drop it in while still lit.

## **Science Principle**

The cloud is formed in the bottle by the water vapor as it collects on the smoke particles from the smoke of the match. When the pressure exerted on the bottle is released a momentary cooling of the water vapor occurs and the cloud forms.