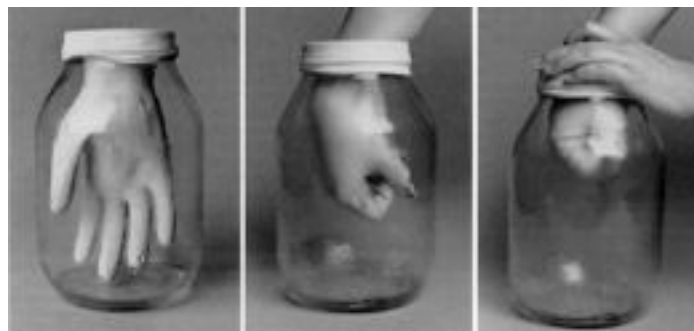


Making a Cloud

CAUTION: Teacher demonstration only. This activity uses lit matches – take due care.

Focus

Clouds form when invisible water vapour in the air is cooled enough to form tiny droplets of liquid water. In the atmosphere, this usually happens when moist air cools as it rises to higher altitudes. At higher altitudes the pressure is lower, so that the gas expands, loses internal energy, and cools. You can accomplish the same cooling effect by rapidly expanding the air in a jar. Here is an activity to make a portable cloud in a bottle.



Materials

- One large clear glass or plastic jar with a wide mouth (a pickle jar works well).
- Tap water
- A rubber glove
- Matches (only to be used by an adult)

Procedure – (20 minutes or less)

- Barely cover the bottom of the jar with water.
- Hang the glove inside the jar with its fingers pointing down, and stretch the glove's open end over the mouth of the jar to seal it.
- Insert your hand into the glove and pull it quickly outward without disturbing the jar's seal. Nothing will happen.
- Next, remove the glove, drop a lit match into the jar, and replace the glove. Pull outward on the glove once more. Warning: If a child is doing this experiment, make sure that an adult is actively supervising.
- Expected results: Fog forms inside the jar when you pull the glove outward and disappears when the glove snaps back. The fog will form for 5 to 10 minutes before the smoke particles settle and have to be replenished.

Alternative: Making a Cloud II

CAUTION: Teacher demonstration only. This activity uses lit matches – take due care.

Materials

- Empty one litre clear plastic bottle with cap
- Warm water
- Matches (only to be used by an adult) or lighter and taper.



Procedure

- Fill a bottle with just enough warm water to cover the bottom.
- Light your match, blow it out and drop it into the bottle.
- Tightly place your cap on the bottle before giving the side of the bottle a hard squeeze six or seven times. Then wait a few seconds, and squeeze the bottle again, but hold the squeeze for a few seconds and quickly release the squeeze.

Explanation – Why Does it Work?

Squeezing the bottle makes the bottle (slightly) smaller, thus forcing the air particles to get closer together and thus increases (slightly) the air pressure and temperature in the bottle.

When you release the bottle the air expands back into its original volume lowering the pressure and temperature in the bottle to the point where the moisture in the air can condense. It will not work without the smoke particles. Why? Water (even in the air) always has to have something to condense on.

Resources

- FS p.5, 6
- TA1-19

Web address source: <http://webs.wichita.edu/facsme/cloud.htm> & <http://www.wikihow.com/Make-a-Cloud-in-a-Bottle>