Blowing Up a Balloon - States of Matter Level 1-2

Concept

This is a simple and fun experiment that can be taught from grade ones to threes. It demonstrates how the addition of a liquid and a solid can form a gas. You may wish to do some simple demonstrations on how the addition matter of similar states can form the same state. This may be the combination of two different coloured liquids, or sand and sugar.

Materials/Equipment

- One plastic (disposable) drinking bottle, a pop top bottle is ideal.
- One balloon
- Baking soda
- Vinegar
- Funnel (see additional note)

Procedure

- Place the funnel into the balloon making sure that the stem reaches the bulb of the balloon, as in the figure.
- Pour the baking soda into the balloon. Tapping may be required. The quantity of baking soda can vary; a suggestion between 1-2 teaspoons is plenty to fill the balloon without it bursting.
- Pour the vinegar into the bottle. The amount of vinegar needed is dependent on the baking soda. A ratio of 1 teaspoon of baking soda to 40ml of vinegar is sufficient.
- Attach the open end of the balloon over the top of the bottle and tip upside down to mix the baking soda and the vinegar.
- The balloon should begin to fill immediately. If not gentle shaking may be required.

Explanation

When the baking soda (sodium bicarbonate) is mixed with the vinegar (acetic acid), a gaseous matter (carbon dioxide) is produced which fills up the balloon. In its simplest form, this experiment shows all three states of matter in one experiment:

Solid (bicarbonate soda) + Liquid (vinegar) = Gas (carbon dioxide)