

Chemical FUNomena—Parent Page

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Your son or daughter attended a program today that included demonstrations of a variety of chemical phenomena. We observed some strange and exciting behaviors of solids, liquids and gases. You may want to ask your son/daughter to tell you about some of the chemical reactions that we observed.

You may also want to help your child try a few simple experiments at home. The following experiments are related to things that we did today.

1. Carbon dioxide is the gas that humans exhale and is the gas that plants use to make sugars in the process of photosynthesis. Carbon dioxide, CO₂, is also used in some fire extinguishers. It does not support combustion and can be used to smother fires.

Experiment

Use a piece of clay or chewing gum to support a birthday candle or other small candle in a short drinking glass. Put 1 teaspoon of baking soda in the glass around the base of the candle. Light the candle, then pour a few teaspoons of vinegar into the glass. The baking soda (sodium bicarbonate) will react with the vinegar (acetic acid) to make carbon dioxide gas. You should see a lot of bubbles or foam as soon as you add the vinegar. The carbon dioxide gas that is produced should extinguish the flame.

2. When a sample of gas at constant pressure is cooled, the volume of the sample of gas decreases. As the temperature goes down, so does the volume. When we blow up a balloon and tie it so that it doesn't leak, we have a sample of gas with a fixed number of gas molecules. The pressure on the balloon is the pressure of the atmosphere, so the pressure on our sample of gas is relatively constant as long as a storm front is not passing through. If we cool the sample of gas by placing the balloon in the freezer, we expect the balloon to shrink as the volume of the gas decreases.

Experiment

Blow up a balloon and tie it securely. Use a few pieces of tape to attach a piece of string or thread to the surface of the balloon like a belt. This will let us keep track of the diameter of the balloon. Place the balloon in the freezer for 15 minutes. Remove the balloon from the freezer and immediately look at the string. Is the string loose? Did the diameter decrease? What happens when the balloon warms up again?

3. We think of rocks as being heavy and styrofoam as being light in weight. Could a small rock weigh less than a large piece of styrofoam? Yes! When we use heavy or light in this way, we are really making a judgement of the weight of a certain size object and drawing a comparison. For example, which would weigh more, a rock that is the same size as a gallon milk jug or a piece of styrofoam that is the same size as a gallon milk jug? We are really talking about density. Density is the weight (or mass) for a particular volume of a substance.

Experiment

Fill a large bucket or kettle with water. Place a can of regular cola and a can of diet cola in the container of water. Does one sink to the bottom? Does one float? The one that floats is less dense than water. The one that sinks is more dense than water. Why? Both cans contain water, but the regular cola contains a lot of sugar, while the diet cola needs only a small amount of artificial sweetener to taste OK. Dissolving something in a liquid makes it more dense!

Visit Mr. Anliker on the web at www.chem.iupui.edu/~anliker/