

Published July 21st, 2010

Science in the Kitchen - Density

By Jonathan Winter



Julia begins the Density Rainbow experiment Photo
Jonathan Winter

Have you ever noticed how oil and vinegar salad dressing separates in the jar? Even if you're not a salad lover, you might have seen your parents shaking up the dressing to mix it before putting it on their salad. The separation has to do with the density of the two liquids. Density has to do with the heaviness of something compared to its size. Here are two experiments that will help you observe the density of liquids.

Experiment A:

Soda Can Density

1. Gather these supplies:

One can regular soda

One can diet soda

A large bowl or bucket

of water

2. Start your experiment:

Fill the bowl to a level that is deeper than the can. Set in the unopened can of regular soda. Take it out and repeat the experiment with the diet soda. Notice any difference?

3. What happened? The regular can of soda is made up of mostly water and corn syrup (or sugar). There is also a little bit of air in the can. If the can had only water and air in it, the can would float, but the syrup makes the soda heavier than the surrounding water, so the can sinks. The diet soda is mostly water also, but the sweetener this time is a small amount of chemical. The chemical is not heavy enough to weigh down the can, so the can floats. The diet soda is less dense than the regular soda.

Experiment B:

Density Rainbow

1. Gather these supplies:

A clear, narrow jar, glass, or
a water bottle

Honey or corn syrup (or

Log Cabin Syrup which
is mostly corn syrup)

Water

Rubbing Alcohol

"Dawn" dish soap (other
dish soaps will probably
work too)

Vegetable oil

Optional: food coloring

2. Start your experiment:

Slowly pour each of the liquids into the bottle (about 1/2 inch, or one finger-width is fine). Be sure to pour them in this order: honey, dish soap, water, vegetable oil, rubbing alcohol. If you like, you can add a drop of food coloring to the water and another to the alcohol before you pour them in.

3. What happened? Each of the liquids you used has a different density. The lighter liquids float on top of the heavier liquids. Your density "rainbow" looks nice displayed on a windowsill!

Note: If you plan to keep this experiment for a while, be sure to keep it covered. Otherwise the rubbing alcohol will evaporate.

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