THE POWER OF SOUR!

Have you ever wondered what makes sour candy sour? The source of that mouth-puckering sensation is acid. The most common acid used in sour candies is citric acid, also found in lemons and other citrus fruits. Other acids that lend a sour taste to candy include malic acid, tartaric acid (commonly called cream of tartar), and fumaric acid. All of these occur naturally in various fruits and vegetables like apples, beans, tomatoes, and grapes.

The materials you will need are:

- 1-3 different types of sour candy
- 1 tsp baking soda
- 1 cup water
- Shallow bowl
- Spoon for stirring

You can easily test your candy to see if an acid is present by dropping it into a baking soda solution. Acids react with baking soda and produce bubbles of carbon dioxide gas. The more acid is present in your candy, or the stronger it is, the more bubbles you will see.

1. Add a teaspoon of baking soda to a cup of water in a shallow bowl and stir to dissolve.
2. Choose 1-3 different kinds of sour candies to test. If you are testing more than one, try to predict which candy will have the most bubbles.
3. Drop the candies into the bowl and observe.

Which candies have the most bubbles? Does this match your prediction?

Explanation: The reaction between baking soda and the acid in your candy is known as an acid-base reaction. The candy contains acid, and baking soda (sodium bicarbonate) is a base. A base is simply any substance that reacts with an acid. We sometimes use the word alkali, which is a base that can be dissolved in water, like baking soda. More acid, or a stronger acid, produces a more sour flavor, and will also produce more bubbles in the reaction.

THE POWER OF SOUR! (continued)

Taking it further: Measuring pH

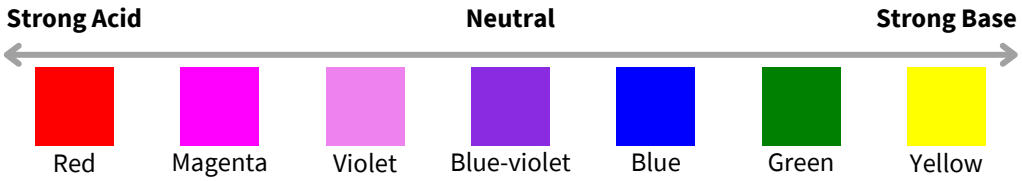
The strength of an acid or base is determined by its pH. (see explanation, below) You can measure the strength of an acid or a base using a pH indicator made from red cabbage.

The materials you will need are:

- 1-3 types of sour candy or candy powder, crushed or chopped
- ¼ tsp baking soda
- Several small containers, each with ¼ cup warm water. You will need 1 for each type of candy, plus 1 for plain water, and 1 for baking soda.
- 2 large leaves of red cabbage, torn or chopped
- 1 cup of warm water in sturdy container for making cabbage indicator
- Spoon or fork for stirring

1. Place each type of candy in a separate small container with ¼ cup warm water and stir to dissolve.
2. Making the indicator: Place chopped cabbage leaves in 1 cup warm water and stir, using the spoon or fork to smash the leaves in the water for several minutes until the water turns a dark purple color. Optional: use a blender or hand blender, then strain the cabbage solids, leaving the liquid.
3. Add some of the liquid to each container and observe any change in color.

Cabbage pH indicator scale:



About the pH scale:

pH stands for ‘power of Hydrogen”. It is a measure of the concentration of hydrogen ions in a solution. Acids have a high concentration of hydrogen ions, and bases have a low concentration. We measure pH on the pH scale, which ranges from 0 to 14, with zero being the strongest acid and 14 being the strongest base. (Note that a low number means a high concentration of hydrogen ions, which can be a bit confusing!) Lemon juice has a pH of around 2, and baking soda has a pH of about 9. Pure water is neither an acid nor base – it is neutral – and has a pH right in the middle of the scale at 7.