Sour Power!

Use a natural indicator to see what puts the pucker in pop! Most sodas have an acid in them called citric acid. This is the acid that gives lemons, oranges, and other citrus fruits a sour taste. In this next activity, you can get an idea of your soda's sour power!

Materials:

- 3 small paper or plastic cups
- Lemon or lemon-lime soda
- Red radish
- Fresh lemon
- Masking tape
- Ballpoint pen
- 3x5 index cards
- Cotton swabs
- Measuring spoon
- Measuring cup
- Water

Note: The type of index cards used may affect how well this activity works. We found that the unlined side of a standard 3x5 index card worked well.

Procedures:

1. Use a pen to divide and label the unlined side of a 3x5 index card into three areas as shown. Label the areas "lemon", "water" and "soda". You or your partner should hold down your card as one of you rubs a radish on the card. Rub the radish hard enough so that the card becomes a fairly dark pink color. This is your indicator.

2. Use your masking tape and pen to label your cups "lemon," "water," and "soda." Ask your adult partner to cut a lemon in half. Squeeze about a teaspoon of lemon juice in its labeled cup. Place about a teaspoon each of water and soda into their labeled cups.

3. Place a separate cotton swab in each cup. Wipe a streak of lemon juice on your radish indicator in its area on the card. What color did your indicator become?

4. Now wipe separate streaks of water and soda on your indicator. Did the water seem to change the indicator color? How about the soda? From this test, do you think the soda has acid in it? Check the soda ingredients and find out!

Think about this ...

The citric acid isn't the only thing in soda that makes it sour. The carbon dioxide gas mixes with the water in soda and makes another acid called carbonic acid. Seltzer water has no citric acid in it but may have carbonic acid from the carbon dioxide. Try using your radish test to find out!

Where's the Chemistry?

The skin of a radish contains natural chemicals that can be used as an indicator. When certain chemicals (such as the lemon juice or lemon-lime soda) are added to an indicator, a chemical reaction occurs causing a color change. An indicator can give you an idea about how acidic a solution is. Where did your soda's power rate on a scale between water and lemon juice?

The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".