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!

You will need:

3 small paper or plastic cups	3x5 index cards
lemon or lemon-lime soda	cotton swabs
red radish	measuring spoon
fresh lemon	measuring cup
masking tape	water
ballpoint pen	

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 card worked well.

Activity

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!

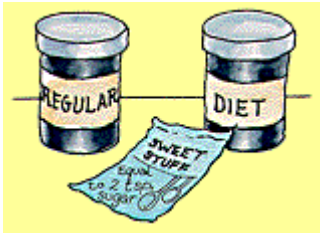
WHAT'S GOING ON HERE?

SOUR POWER!

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?

From:
http://www.chemistry.org/portal/a/c/s/1/wondernetdisplay.html?DOC=wondernet\whatsup\soda\wu_soda.html

HOW SWEET IT IS!



In this activity, the difference between regular and diet soda is uncanny!

You will need:

can of regular Pepsi	masking tape
can of diet Pepsi	ballpoint pen
bucket of water	sugar
2 plastic or paper cups	artificial sweetener
2 empty film canisters	

Activity

1. Fill a bucket with water. Place your cans of diet and regular soda in the water. Make sure no air is trapped under the cans. What do you notice? If these cans are exactly the same size and contain exactly the same amount of liquid, why would one sink and the other float? (HINT: Since one is diet and one is regular, they may contain different amounts of sweetener.) Which do you think contains more? Why?

2. Use your masking tape and pen to label one of your film canisters "regular" and the other "diet". Look at a pack of artificial sweetener. It says that it has the same sweetness as 2 teaspoons of sugar.

3. Place 1/4 cup of warm water in two separate cups. Add 4 teaspoons of sugar to one cup and stir until no more will dissolve. Add 2 packets of artificial sweetener to the other cup and stir until no more will dissolve.

4. Fill the "regular" film canister with the sugar solution. Fill the "diet" film canister with the artificial sweetener solution. Fill them both as high as you can. Place the tops securely on both canisters. Place both containers in a bucket of water. What do you observe?

Think about this...

When two objects are exactly the same size and shape but one is heavier than the other, we say that the heavier one is more *dense* and the lighter one is less *dense*. Since the cans of soda have the same amount of liquid in them, which one do you think is more dense, the regular or the diet? How about in the film canister experiment? Which one was more dense?

Can you come up with an experiment to see whether salt water is more dense than plain water?

What's going on here?

HOW SWEET IT IS!

In this activity, you placed a can of diet soda and a can of regular soda in water. The amount of soda in both cans are the same, yet the can of diet soda floats and the can of regular soda sinks. This happened because the contents of the regular soda is heavier than the contents of the diet soda. The reason why it is heavier is because regular soda has about 9 teaspoons of sugar dissolved in it while diet soda has less than 1/4 teaspoon of artificial sweetener. Since the sugar is heavier than the artificial sweetener, the can of regular soda is heavier than the can of diet soda.

In the film canister activity, you made up your own solutions using artificial sweetener and sugar. One packet of artificial sweetener has the sweetness of two teaspoons of sugar. To compare a sugar solution with an artificial sweetener solution, you dissolved 2 packets of artificial sweetener and four teaspoons of sugar each in 1/4 cup of water. When you tested them in film canisters, you could see that the sugar solution was more dense, since it sunk while the artificial sweetener solution floated.

PASTA WITH PEP!

A wet noodle may be more fun than you thought - especially when its souped up with Soda Pop Power!

The thing that makes soda pop different from most other liquids is the fizz. The soda company puts the fizz in soda by adding a gas called *carbon dioxide*. You can see some of this carbon dioxide fizz, bubble, and pop in your first activity with soda pop!

You will need:
rottini noodles (uncooked) (note: you may substitute raisins instead – test your rottini and if your brand fails, use raisins – they always work)
clear soda
2 clear plastic cups (8 oz.)
watch (with a second hand)

Activity

1. You and your partner should each pick a cup and fill it about 3/4 full of soda. Choose 2 or 3 noodles and place them in each cup. Observe the noodles closely for a minute or two. What happens?

2. You and your partner should each choose the noodle that went up and down the most in your cup. This is your prize noodle! Remove the noodles from the cups and save your prize noodle. Put a little racing mark on your best noodle so you can tell it from your partner's.

3. Put one cup away and place the other cup in the middle as your ***Noodle Challenge Cup!*** When you say "GO" you and your partner should place your prize noodles in the challenge cup. The noodle that gets to the surface the most times in two minutes wins! GOOD LUCK!

Try some other kinds of noodles to see which type works best!

Think about this...

Have you ever noticed bubbles forming on anything else you have put in soda? Did you ever wonder why they form on some things faster than others? Pour about 1/2 cup of soda into a clear plastic cup. At the same time, place a pipe cleaner and a straw side by side into the cup. Was there a difference in how fast the bubbles formed on each? What do you think might cause the difference?

WHAT'S GOING ON HERE?

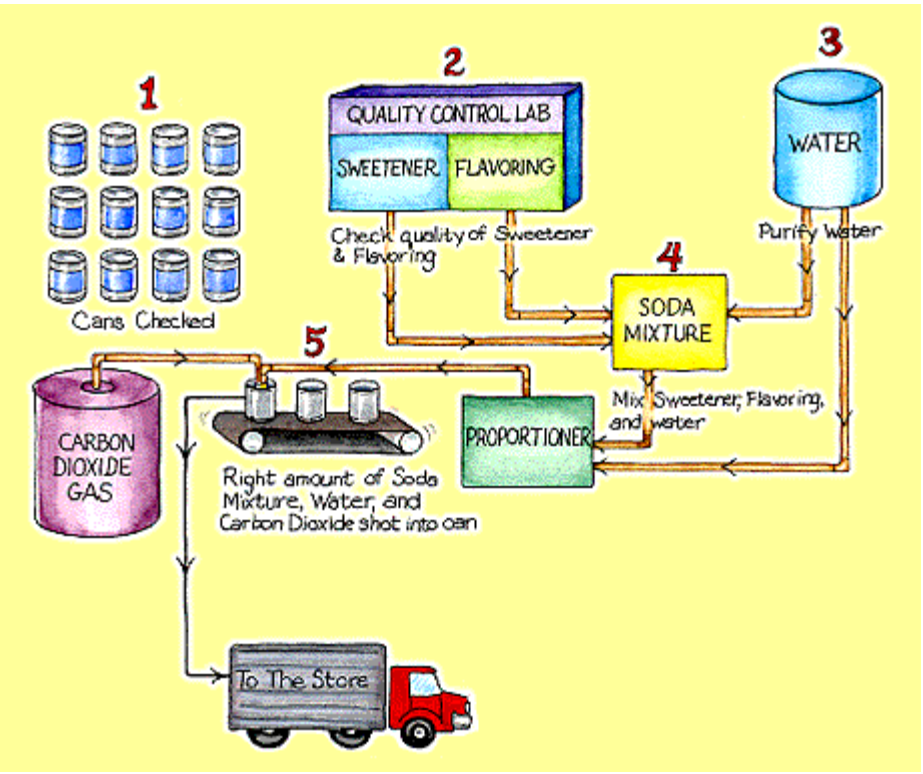
PASTA WITH PEP!

In this activity, you placed noodles in soda pop and probably noticed that bubbles formed on the noodles. Bubbles formed on the noodles because of the carbon dioxide gas in the soda pop. Once the carbon dioxide has a surface, such as the noodle, to form on, it can build up and form bubbles, and cause noodle raising excitement!

From: http://www.chemistry.org/portal/a/c/s/1/wondernetdisplay.html?DOC=wondernet\activities\soda\soda.html

The Science of Sodapop!
How Is Soda Pop Made?

Soda pop is so POPular because of its great taste and fabulous fizz. To see how it's made and tested, just click on the numbers in order from 1-5.



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