

AUGUST EXPERIMENT 2

Acid–Base Chemistry

by STEM Powering

August 17th is National Nonprofit Day! To celebrate STEM Powering Canada, we've prepared this super cool colour changing experiment for you to try at home!

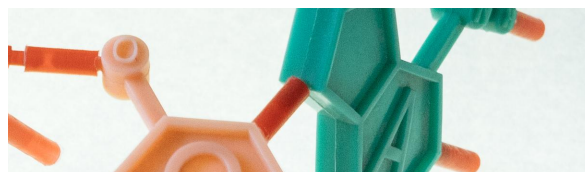
Acids and bases are a large part of our daily lives and sometimes we don't even realize it! Acids are substances with a pH lower than 7, and basic substances have a pH higher than 7! A pH of 7 is a neutral substance, like water! Whenever your mouth puckers from eating a lemon slice, you're tasting an acidic substance! Fruits and vegetables like grapes and broccoli are basic!

We can test the pH of a substance using an indicator, and in this experiment, we are going to make our own! The red cabbage juice that we are going to make is a natural indicator, and will change colours depending on the pH of the substance that is added to it! The image below shows the pH scale of the red cabbage indicator.

Compare the colours you discover to this image to find out their pH!

Materials List:

- Red cabbage
- Stovetop
- Small Pot
- Water
- Vinegar
- Baking soda
- 3 Small Jars or Cups



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Procedure:

1. Boil $\frac{3}{4}$ of a small pot of water. Once boiling add in 3-4 chopped large red cabbage leaves. Ask a parent/guardian for help with this step! Stop boiling the mixture when you achieve a dark blue/purple colour, similar to the colour at 7 on the image above.
2. Split this mixture into 3 small jars or cups and line them up.
3. In the left jar, add one teaspoon of vinegar to this mixture. What happens?
4. In the right jar, add one teaspoon of baking soda to this mixture. What happens?
5. Compare these colours to the image above!
6. Try other household substances you have around your house to test their pH!

The Science Behind this Experiment:

Red cabbage contains chemical compounds called anthocyanins and boiling the red cabbage releases these compounds allowing the liquid to be used as an indicator!

Adding different substances to this liquid alters the shape of anthocyanin molecules and leads to the change in colour! The colour modifications indicate the pH of a substance when compared to the scale shown above!

