RAFT IDEAS

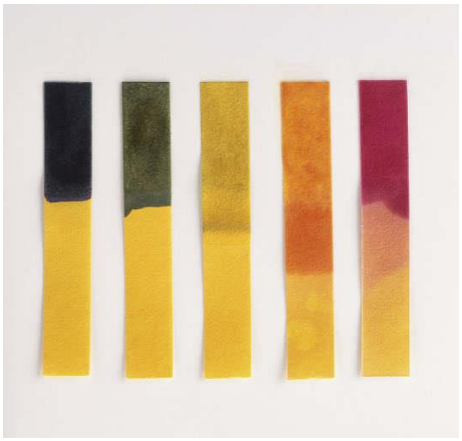
Topics: Acids and Bases, Chemical Reactions

Materials List
- ✓ Red cabbage
- ✓ Knife
- ✓ Blender
- ✓ Water
- ✓ Coffee Filters
- ✓ Optional- sieve

This activity can be used to teach:
- Properties of materials (Next Generation Science Standards: Physical Science, Grade 2, 1-1 & 1-2; Grade 5, 1-3)
- Chemical reactions (Next Generation Science Standards: Physical Science, Middle School, 1-2; High School, 1-2)

Acid or Base?

Create inexpensive litmus papers



Use red cabbage juice to create litmus paper. Acids and bases make it change color!

Preparation
1. Chop the red cabbage head into pieces suitable for your blender.
2. Cover the cabbage with water and blend.
3. Strain the red cabbage juice. (Suggestion – use the blender lid or a sieve to separate the juice from any bits of cabbage.
4. Soak clean coffee filters in the juice.
5. Dry the filters and then cut them into strips.

To Do and Notice
1. Once the litmus paper strips are ready test them on various liquids. For example, vinegar, baking soda and water, orange juice, milk, soda, or coffee.
2. Acids turn the litmus strips red. Bases turn the litmus strips blue or green.
3. Try putting vinegar and baking soda together and retest with a new litmus paper, what happens?

The Science Behind the Activity
An **acid** is substance that can donate **hydrogen ions (H^+)**. A **base** is a substance that can accept hydrogen ions. **Indicators** are used to detect the relative concentrations of hydrogen ions (pH). Cabbage juice contains **anthocyanins** that are highly sensitive to pH. Anthocyanins reflect red light in the presence of acids **(pH < 7)** and blue light **(pH>7)** when mixed with bases. When vinegar reacts with baking soda, the resulting reaction neutralizes both the acid and the base to form a **salt (sodium acetate)**. The reaction also produces **carbon dioxide (CO_2)** gas.

Web Resources (Visit www.raft.net/raft-idea?isid=701 for more resources!)
For more information on the pH scale, go to:
http://staff.jccc.net/PDECELL/chemistry/phscale.html

raft resource area for teaching
www.raft.net

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