Another FREE SAMPLE LAB from TOPS LEARNING SYSTEMS!

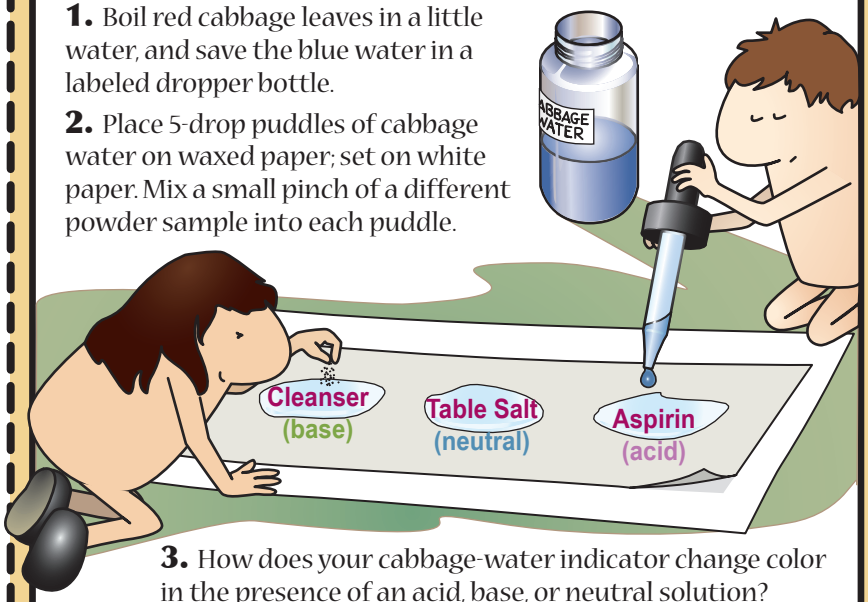
This **TOPS Idea** is taken from an original series of black-and-white line masters, adapted to stand alone as an independent mini-lesson. Please purchase our original book to get the whole in-depth program.

cabbage chemistry

…adapted from **ANALYSIS #10** by TOPS Learning Systems

1. Boil red cabbage leaves in a little water, and save the blue water in a labeled dropper bottle.

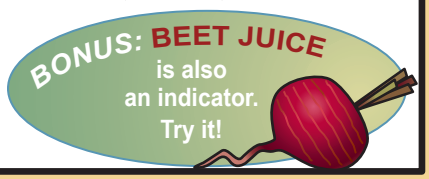
2. Place 5-drop puddles of cabbage water on waxed paper; set on white paper. Mix a small pinch of a different powder sample into each puddle.



3. How does your cabbage-water indicator change color in the presence of an acid, base, or neutral solution?

4. Test whether these substances are ***acid***, ***neutral***, or ***base***:

baking soda, alum, vinegar, garden lime, sugar, lemon juice, corn starch, ammonia…



OBJECTIVE

To investigate the properties of cabbage water as an acid-base indicator.

LAB NOTES

Steps 3-4. Some degree of color blindness challenges some boys, so be sure each lab group includes at least one "color expert."

ANSWERS

3. The cabbage water color is:
Pink-purple in the presence of an ***acid***.
Green-yellow in the presence of a ***base***.
Blue in the presence of a ***neutral*** solution.

4. ***Bases***: baking soda, garden lime, ammonia
Neutral Solutions: sugar, corn starch
Acids: alum, vinegar, lemon juice
Bonus: Neutral to acidic beet juice remains red, but turns darker red-to-purple when basic.

EVALUATION

Q. A lime is a highly-acidic fruit. Propose an experiment using red cabbage leaves to demonstrate that this is true.

A. Boil cabbage leaves in water; reserve the blue liquid. As in **3** above, this liquid will turn pink-purple in the presence of the acidic juice.

MATERIALS

- Red cabbage leaves. If students boil their own, supply a Bunsen burner or hot plate, heat resistant beaker, and dropper bottle. (Or boil leaves in advance, bottle the liquid, and refrigerate.)
- Powders in bottle caps taped to labeled index card: kitchen cleanser, table salt, crushed aspirin, baking soda, alum, sugar, corn starch, and garden lime (hydrated or dry).
- Liquids in labeled dropper bottles: white vinegar, lemon juice (fresh or concentrate), clear unscented ammonia (labeled "poison"). Caution kids to avoid contact with eyes and skin, and have access to water in case rinsing is needed.
- Waxed paper and white scratch paper, scissors if needed.
- Bonus: the juice from ***non-pickled*** canned beets, dispensed in dropper bottles for stain control.

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