

Chemistry – "The Cabbage Chemist"

Topic: Acids, Bases, and pH Indicators **CAPS Grade:** Grade 7 (Term 2) & Grade 9 (Term 2)

Materials:

- **The "Chemicals":** Vinegar (Acid), Lemon Juice (Acid), Water (Neutral), Bicarbonate of Soda (Base), Handy Andy or soapy water (Base), Jik/Bleach (Strong Base).
- **The Equipment:** 6 clear plastic cups (or cut the bottoms off clear 2L cool drink bottles), a spoon.
- **The Indicator:** 1 Red Cabbage (or Turmeric powder if cabbage is unavailable).
- **Heat Source:** A kettle or a pot (to boil water *before* the lesson).

The "Frugal" Solution

Professional labs use "Universal Indicator" or Litmus paper, which is expensive. Red Cabbage contains a pigment called *anthocyanin* that changes color exactly like Litmus paper.

The Procedure

1. **Prep (Teacher does this at home):** Chop the red cabbage. Pour boiling water over it and let it sit for 30 minutes until the water turns dark purple. Strain out the leaves. This purple water is your **Indicator Fluid**. Bring it to school in a bottle.
2. **The Setup:** Line up the 6 plastic cups. Pour a little bit of the household items into each (Vinegar in one, dissolved Bicarb in another, Jik in the last, etc.).
3. **The Magic:** Ask students to predict what will happen. Then, pour the purple cabbage water into each cup.
 - **Acids (Vinegar/Lemon):** Will turn bright **PINK/RED**.
 - **Neutrals (Water):** Will stay **PURPLE**.
 - **Bases (Bicarb/Soap):** Will turn **BLUE/GREEN**.
 - **Strong Bases (Jik):** Will turn **YELLOW** or clear (it bleaches the pigment).

The Lesson Takeaway

Students learn that chemical properties can be visually identified using natural substances. No Bunsen burner required.