

## Acid-Base Exploration

**Question:** What colors represent different ranges of pH from most acidic (low pH) to most basic (high pH) in Cabbage Juice pH indicator?

**Background Information:**

Acid: \_\_\_\_\_

Base: \_\_\_\_\_

pH: \_\_\_\_\_

Indicator: \_\_\_\_\_

**Hypothesis:** I think acids will turn our indicator \_\_\_\_\_ and bases will turn our indicator \_\_\_\_\_ because \_\_\_\_\_

**Materials:**

- Dropper Bottles of lemon juice, orange juice, apple juice,  $\text{NaHCO}_3$  (aq) (sodium bicarbonate solution), drain cleaner, and bleach.
- Tiny spoon / small flat wooden stick
- Prepared cabbage ph indicator
- Test tube rack & 6 test tubes
- Masking tape & a marker
- Graduated cylinder
- Safety Goggles

**Procedure:**

1. Label your test tubes A – F using masking tape.
2. In each test tube pour 10ml of the cabbage indicator solution.
3. Add 5 drops of lemon juice to test tube A & swirl. Record the color in data table
4. Add 5 drops of orange juice to test tube B & swirl. Record the color in data table
5. Add 5 drops of apple juice to test tube C & swirl. Record the color in data table
6. Add 5 drops of  $\text{NaHCO}_3$  (aq) to test tube D & swirl. Record the color in data table
7. Add 5 drops of drain cleaner to test tube E & swirl. Record the color in data table
8. Add 5 drops of bleach to test tube F & swirl. Record the color in data table

Color							
pH	1-2	3-4	5-6	7	8-10	11-12	13-14
Test Tube	A	B	C	Cabbage Indicator	D	E	F
Chemical							
Acid or base?	Strong		Weak	Neutral	Weak		Strong

9. Now add 30 more drops to each test tube, swirl, observe what happens and record your data.

Color							
pH	1-2	3-4	5-6	7	8-10	11-12	13-14
Test Tube	A	B	C	Cabbage Indicator	D	E	F
Chemical							
Acid or base?	Strong		Weak	Neutral	Weak		Strong

**Results and Analysis:**  
Why does this work?

The color of the juice changes in response to changes in its \_\_\_\_\_ ion concentration. Acids will \_\_\_\_\_ hydrogen ions and have a \_\_\_\_\_ ph.

Bases \_\_\_\_\_ hydrogen ions and have a \_\_\_\_\_ ph.

**Conclusion:** On the next page of your notebook, write a conclusion for this lab. Your conclusion should explain the following:

- The question for this lab
- Whether or not your hypothesis was supported
- What acids and bases are and how they are related
- What is an indicator and why do we use them.
- What is the pH scale and what does it tell us.
- What you learned in this lab.

Color in the pH Scale according to your data



Acidic Solution



Neutral Solution



Basic Solution

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14