**pH Lab**

*You ONLY need to complete the starred (\*) sections on notebook/graph paper.*

**Background:** pH is a measure of how acidic or basic a substance is. An acidic solution has a pH of 1—6 and has a higher concentration of H+ ions. A basic solution has a pH of 8—14, and has a higher concentration of OH- (hydroxide) ions. Neutral solutions, such as deionized water, have a pH of 7 and an equal concentration of H+ and OH- ions. An indicator is something that changes color in the presence of the substance it indicates. Two different indicators will be used in this lab: litmus paper (pH paper) and cabbage juice.

**\*Purpose:** To determine the pH values of different household substances using two different types of indicators.

**\*Hypothesis:**

Acids: Bases: Neutral:

**\*Variables:**

* IDV: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(range-list the household substances being tested—see the board)
* DV: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Constants: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Control: \_\_\_\_\_ because…

**Materials:**

|  |
| --- |
| * Cabbage juice indicator |
| * White paper * Microwell Tray |
| * Household materials with pipettes: See board |

**Procedure:**

1. Put on your goggles; goggles must be worn throughout this experiment!
2. Gather materials.
3. Place 3 drops of each household material into separate wells of the microwell. Be sure to have some way of keeping track of which material is in which well, so they don’t get mixed up. **Note: Do not cross-contaminate any of the household materials!**
4. Add 3 drops of cabbage juice indicator to each well, and record the colors in the data table. (You may want to put your microwell on a white sheet of paper to see the colors more easily.)
5. Record the pH values from the board.
6. Clean Up: Carefully add water to fill each of the wells, empty the wells into the sink, rinse the microwells dry all materials, and return materials to the teacher lab table. Wipe down your lab station with a sponge. Take off your goggles and put them away.

**\*Data:** Create a data table with a title and labels. It needs to include the household items, pH from the litmus paper, and the color from the cabbage juice indicator.

**\*Graph:** Create a bar graph with the household items on the x-axis (list them in order from most acidic to most basic. Put pH (from the litmus paper) on the y-axis. Color the bars to match the colors you got from the cabbage juice indicator. Don’t forget TULIPS. (Summary-Acids turn \_\_\_ in the presence of cabbage juice, while bases turn \_\_\_.)

**\*Data Analysis:**

* Acids: \_\_\_\_\_\_\_\_\_ (pH value), \_\_\_\_\_\_\_\_\_\_\_ (pH value)…
  + What does this mean? Address H+/OH- concentrations.
* Bases: \_\_\_\_\_\_\_\_\_ (pH value), \_\_\_\_\_\_\_\_\_\_ (pH value)…
  + What does this mean? Address H+/OH- concentrations.
* Neutral: \_\_\_\_\_\_\_\_ (pH value), \_\_\_\_\_\_\_\_\_\_ (pH value)…
  + What does this mean? Address H+/OH- concentrations.