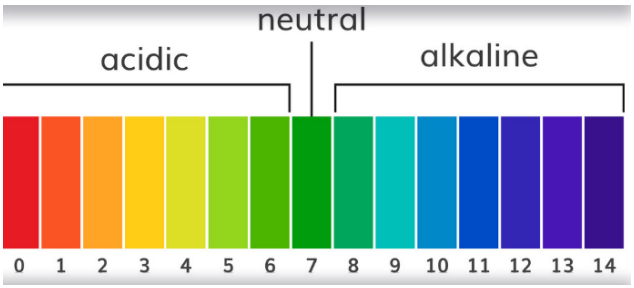
Name:_____ Date:_____ Period:_____

pH Exploration Lab

Background: Acidity or alkalinity (basic) is a measure of the relative amount of H^+ (hydrogen) ions and OH^- (hydroxide) ions dissolved in a solution. Neutral (pH of 7) solutions have an equal number of H^+ and OH^- ions. Acids (pH below 7) have more H_3O^+ ions (H+) than OH^- ions. Acids taste sour (think lemon juice) and can be corrosive. Digestive fluids in the body are acidic and must be neutralized by buffers especially as the stomach juices enter the small intestine. Bases (pH above 7) contain more OH^- ions than H_3O^+ ions. Bases taste bitter and feel slippery.



In living things, maintaining proper pH levels is extremely important to an organism's survival. In a human's stomach, the digestive juices are acidic and must be neutralized by **buffers** when the stomach contents enter the small intestine. Without the buffers your small intestine would be damage by the acidic stomach contents. Aquatic organisms like fish are sensitive to changes in pH. Pollutants like excessive carbon dioxide in the atmosphere could interact with the water it can cause changes in pH and cause the fish or other aquatic organisms to die.

In this activity you will practice determining the pH of common household products. You will test five different items.

Materials:

- Pipette
- pH test strip or other indicator (directions may vary depending on the type of test strip being used)
- Petri dish
- At least 5 household products with varying pH

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Directions:

1. Gather your materials and listen to the teacher's directions.
2. Label and place a title heading on the data table.
3. Place one test strip in the clean dry petri dish.
4. Obtain a sample of the solution you wish to test.
5. Use a pipette to place two drops of solution on the test strip.
6. Wait 15 seconds (time may vary depending on the type of test strip) and compare the color of the test strip to the color chart provided with your test strips.
7. Record your data the table below:

Title:

Clean up – clean the petri dish, throw the pH strips and paper towels away, rinse out the solutions and pipets.

Questions:

1. What does alkalinity mean?

2. What is the name for the OH- ions?

3. What is the name for the H+ ion?

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4. Which substance was the most acidic?

5. Which substance had the most H+ ions?

6. Which substance was most basic?

7. Which substance had the most OH- ions?

8. Where any of the solutions you tested neutral? If so, which one(s)?

9. Were the physical **observations** you made quantitative or qualitative? Explain.

10. Was the data you recorded into the data table quantitative or qualitative? Explain.

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General Teacher notes:

This lab is intended to get students familiar with the vocabulary, practice lab protocol, classroom procedures and familiar with e pH scale in general.

Try to provide students with a variety of household items to test. Examples could include: lemon juice, ammonia, orange juice, sodas, baking soda solution, bleach (use caution), vinegar, distilled water, tap water, energy drink, fish tank water, rain water….whatever you can find in your class.

You can demo other indicator solutions like Bromothymol blue, cabbage juice indicator solution: chop cabbage, bring water to a boil, pour of the hot cabbage, and let it steep for about 10 minutes. Strain solution and use as a pH indicator (this solution would have a pH of 7).

Do not have students place the pH strip on paper towel to do the testing. This can impact the results of the test since the content of the paper towel become part of the experimentation.

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