

Virtual pH Lab

PART 1:

BrainPop Movie

- Go to <http://www.brainpop.com>, and select "Login" in the top right. Enter the username: **sweethome** and password: **schools**
- Next, search for "pH" in the search bar at the top left. Click on "pH Scale: From Acids to Bases".
- Watch the movie and complete the following questions as you watch (with the sound on just loud enough for you to hear, but don't disturb those around you!)
- There is a word bank on the right to help you answer the questions.

1. The term _____ refers to the chemical potential of hydrogen.

2. The pH _____ measures how _____ or basic a substance on a scale of 1 to 14. _____ measure from 1 to 7, while the _____ or alkaline side measures from 7 to 14.

3. Identify each as an acid (A) or a base (B).

____ Lemon juice ____ Soap ____ Battery acid ____ Hydrochloric acid
____ Toothpaste ____ Vinegar ____ Baking soda ____ Floor cleaner

4. Really strong acids and bases are found at the _____ of the scale, while those near the _____ are weaker. Right in the middle at exactly 7, or pH _____, you have pure water.

5. Acids contain _____ ions (H^+), while bases contain _____ (OH^-) ions. Ions are atoms that have either lost or gained _____. In bases you find hydroxyl ions, which have _____ electrons. Hydrogen ions found in acids are _____ that have had an electron knocked off, which is why these ions are always trying to get the lost electrons back. When you put a metal in acid, the metal starts to _____.

6. Bases have the power to _____ acids. The hydroxyl ion _____ its electron with the hydrogen ion. The H^+ from the hydrogen ion and the OH^- from the hydroxyl ion bond together to form H_2O , which is _____ with pH neutral. Different types of _____ are formed depending on the types of acids and bases involved in the reaction.

7. When Moby poured the baking soda (a base) into the vinegar (an acid), a reaction occurred. Salt, water, and _____ were produced by the reaction.

8. _____ are substances that can block changes in their pH for period of time. You can find them on buffered aspirin, which keeps your _____ from dissolving the medicine too quickly. Buffers are made by combining _____ acids and bases. Buffers also are found in our body to keep our the pH of our _____ at or around 7.4.

Word Bank:

Acidic
Acids
Atoms
Bases
Blood
Blue
Buffers
Carbon dioxide
Center
Dissolve
Electrons
Ends
Environment
Gained
Hydrogen
Hydroxyl
Indicator
Neutral
Neutralize
pH
Red
Salts
Scale
Shares
Stomach acid
Strong
Water
Weak

9. Most science labs have pH paper, which is paper that has been soaked in a special chemical _____ . They turn _____ in an acid and _____ in a base. By comparing the color of the pH paper to a chart, you can determine how _____ an acid or base is.

10. Constant reactions between acids and bases keep our _____ from being too acidic or too alkaline.

PART 2:

Go to the following website:

http://www.glencoe.com/sites/common_assets/science/virtual_labs/E22/E22.html

Read the information on the left sidebar and answer the pre-lab questions.

Pre-lab Questions:

1. What is pH?

2. Describe how to use and interpret pH paper.

3. pH ranges from _____ to _____.
 - a. Acidic solution =

 - b. Neutral solution =

 - c. Basic solution =

Procedure:

4. Record the names of the six solutions listed under numbers 1-6 in the data table below under the "Solutions" column.

5. Predict the pH values of these solutions. Enter these numbers (from 0-14) in the "Predicted pH Value" column in the table.

pH Values of Common Solutions

Solutions	Predicted pH Value	Actual pH Value	Type of Solution (acidic, neutral, or basic)

- Use the pH paper to test the first solution. Click and drag the paper into the test tube, then match its color on the scale of pH values. Use the pH value counter (the arrows beneath the name of each solution) to indicate the pH value of the solution.
- Use separate strips of pH paper to test each of the remaining solutions and determine its pH. Adjust the pH value counter for each solution.
- When all the pH values are entered, click the "Check" button on the bottom to see if your answers are correct. If a pH value is incorrect, the number is highlighted yellow. Use the pH paper to test the solution again. Adjust the pH value counter accordingly. Then click "Check" again.
- After the pH values of all six solutions are correct, record your data in the "Actual pH Value" column in the data table.
- In the last column in the table, decide whether each solution is acidic, neutral, or basic.

Analysis:

- What prior knowledge did you use to predict the pH values of the solutions?
- How did your predicted pH values for each of the common solutions compare with the actual values for those solutions?

13. Of the six solutions you tested, which one was the most acidic? Which one was the most basic? Which one was the closest to neutral?

14. Milk of magnesia is sometimes used as a remedy for an “acid stomach.” Would you expect the pH of milk of magnesia to be less than 7, more than 7, or 7? **WHY?**

15. What are some real-world applications in which pH is an important factor?