

# Lab: Using Acid-Base Indicators

## HONORS BIOLOGY: UNIT 1

**Background:** Many items commonly found at home are acids or bases. For example, many of the food you eat contain acids. Many of the commonly used cleaning products are bases. Indicators are special chemicals that change in the presence of one of these substances. The red and blue litmus paper and pH paper that you will use in this lab are types of indicator papers. In this lab you will test ten substances using the different indicator papers.



**Procedure:**

1: Place five drops of each substance into each of the numbered wells of the reaction plates. Make sure that the number on the solution matches the number on the well.

2. Make a prediction on whether the substance is an acid or a base before you test solutions.

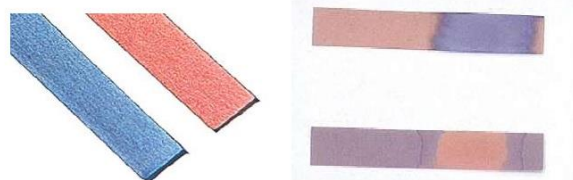
3: Test each solution with the **red litmus paper** and **blue litmus paper**. To do this, tear the paper in half then dip one end of the paper into the solution. Note: The red and blue litmus paper will change color if it is a positive (+) test. It will remain the same if it is a negative (-) test. Record in Data Table #1.

4. Test each solution with **pH paper**. pH paper will turn a specific color. Locate and match the color to the outside of the pH paper bottle and record both the color and the pH number. Record in Data Table #1.

5. Answer Analysis and Conclusion questions when you complete data table.

### LITMUS PAPER

The main use is to test whether the solution is acidic or alkaline.



	Test with acid	Test with alkali
<b>Red litmus paper</b>	No changes	Red → blue
<b>Blue litmus paper</b>	Blue → red	No changes

### Data Table #1

Substance Tested	PREDICTION acid or base	Red Litmus (+ or -)	Blue Litmus (+ or -)	pH Paper color	pH number
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

### **Analysis and Conclusion Questions:**

1) Was the pH of any of the solutions significantly different than what you hypothesized? Explain

2) What is the pH range of the solutions you tested? Are any of the solutions very acidic or very basic?

3) What does pH measure?

4) Compare the hydrogen ion concentration in vinegar to window cleaner.

5) Word Origins. The *p* in pH stands for the German word *Potenz*, which means “power” or “potential”. The H represents the hydrogen ions (H<sup>+</sup>). How are these related to the definition of pH?

7) Describe the relationship between the hydrogen ions ( $H^+$ ) and pH. How is pH related to a solution's acidity?

8) Do you notice anything about the solutions on the pH scale, their pH, and their location on the pH scale?

9) Is the litmus paper useful in determining the exact pH? **Explain!**

10) In this lab data, were there any solutions that were not an acid **or** a base? If so, please name the solution.

11) Draw a pH scale from 1-14 on the next page and place each of the substances you tested on the scale according to their measured value.

