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# Lab Chemical – Understanding pH

Intended Audience – Middle School Level

## Teacher Guide

### Purpose:

The purpose of this exercise is to help the children to get a better understanding of pH by measuring several solutions and recording their findings. Measuring the different levels of chemicals and hormones in the body are key roles that a Medical Technologist performs everyday.

1. pH is the measurement of the acidity or base of a solution.
2. The pH scale ranges from 0-14 with 7 being neutral and  $< 7$  acidic,  $> 7$  basic

### Procedure:

1. Make sure that all of the students have on gloves, lab coats and goggles before starting.
2. Provide each student with one cup of test tubes which are labeled A, B and C.
3. Have the student take a strip of litmus paper and dip it in the test tube labeled A (Vinegar) which is an Acid.
4. Have the student record their observation on the student worksheet.
5. Follow steps 1 – 4 for tubes B (soapy water) & C (water).

### Final Eruption (acid base reaction)

1. Pour the contents of tube A into B and watch what happens.

### Observation Questions:

#### Tube A:

*Tube A is filled with vinegar. Ask the students what it smells like, looks like and what they think it is. Have them to refer to the pH chart to determine if it is Acidic, Basic or Neutral. What other things are they aware of that are acidic (Acid, citrus fruits, batteries)?*

#### Tube B:

*Tube B is filled with soapy water, ask the students what it smells like, looks like and what they think it is. Have them to refer to the pH chart to determine if it is Acidic, Basic or Neutral. What other things are they aware of that are Basic (soaps, hydrogen peroxide, green leafy vegetables)?*

#### Tube C:

*Tube C is filled with water, ask the students what it smells like, looks like and what they think it is. Have them to refer to the pH chart to determine if it is Acidic, Basic or Neutral. What other things are they aware of that are Neutral (Water, tears)?*

#### Tube A and B

*Acids and bases react with each other in interesting ways!*

### What do you think the pH of your blood is and why?

1. Blood pH is 7.4 and slightly basic so that it can work with the other parts of the body and help fight of disease
2. Your body is made up of 60% water. Since water is neutral, it works perfectly with your body and does not damage or harm organs.
3. Water is neutral.

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## Student Sheet

### Procedure:

1. Take the tube labeled A and dip a piece of the litmus paper in the solution.
  - a. Did the strip change color? (circle):      Yes              No
  - b. What color is the strip? .....
  - c. Is it an Acid, Base or Neutral? .....
2. Take the tube labeled B and dip a piece of the litmus paper in the solution.
  - a. Did the strip change color? (circle):      Yes              No
  - b. What color is the strip? .....
  - c. Is it an Acid, Base or Neutral? .....
3. Take the tube labeled C and dip a piece of the litmus paper in the solution.
  - a. Did the strip change color? (circle):      Yes              No
  - b. What color is the strip? .....
  - c. Is it an Acid, Base or Neutral? .....

### Something to think about:

1. What do you think the PH of your blood is and why?
2. How much of your body is made up of water
3. Is water an Acid, Base or Neutral?



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