Name: Date: Period:

Objective: SWBAT classify substances as acids or bases using the pH scale, pH indicator, and litmus paper.

**pH Scale, pH indicators, Litmus paper**

**Key Question # 1: What is pH?**

**pH** is a measure of how many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (H30+) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (OH-) ions are in a solution.

**Acids** produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Bases** produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Key Question #2: What is a pH scale?**

The **pH scale** is used to express the strength of acids and bases.

**Key Question #3: How do we find the pH of a substance?**

1. **pH meter** uses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to measure the ions and converts them to pH
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** isused to measure or indicate the \_\_\_\_\_\_ of a substance.
3. **Litmus paper** changes colors to indicate acids or bases

|  |  |
| --- | --- |
| **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Litmus Paper**  **Turns \_\_\_\_\_\_\_\_\_\_\_\_\_\_ when dipped in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if dipped in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or neutral.** | **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Litmus Paper**  **Turns \_\_\_\_\_\_\_\_\_\_\_\_\_ when dipped in an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ if dipped in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or neutral** |

**4.) pH paper changes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to indicate the pH of a substance.

**Independent Practice: Acids and Bases**

1. A student mixes strawberry koolaid and water. A pH meter is used to measure pH of 5.4. What kind of solution is strawberry Koolaid – acid or base?

2. A student adds an alka-seltzer to the koolaid and stirs. The pH meter now reads 8.3. Did the alka-seltzer make the Koolaid more acidic or more basic?

|  |  |  |  |
| --- | --- | --- | --- |
| **Situation** | **pH** | **Acid or base?** | **Strong or Weak?** |
| Water directly out of tap | pH =7.0 |  |  |
| Water after exhaled air is blown through a straw into it for 5 minutes. | pH=5.1 |  |  |
| Water after a snail has lived in it for three days | pH=5.8 |  |  |
| Water with 2mL of bleach added | pH=9.4 |  |  |
| Water with instant coffee added | pH=5.0 |  |  |
| Water after an aquatic plant is grown in it for three days in bright sunlight | pH=7.7 |  |  |

1.) Which substance is an acid?

F. orange juice with a pH of 3

G. pure water with a pH of 7

H. baking soda with a pH of 9

2.)Which is the pH of a weak acid?

F. 9.1

G. 8.2

H. 7.0

J. 6.5

3.) According to the pH chart below, place the substances in the appropriate categories.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Strong Acid | Weak Acid | Neutral | Weak Base | Strong Base |
|  |  |  |  |  |



The following substances were tested for pH. List the following substance in order of strongest acid to weakest acid to basic to strongest base.

1. **Which properties most likely indicate that a substance is an acid?**
   1. Releases hydroxide ions when dissolved in water
   2. Turns red litmus paper blue and conducts an electric current
   3. Turns blue litmus paper red and conducts an electric current
   4. Has a pH above 7 and corrodes a nail
2. **Which properties most likely indicate that a substance is a base?**
   1. Releases hydroxide ions when dissolved in water
   2. Does not conduct an electric current
   3. Turns blue litmus paper red and conducts an electric current
   4. Has a sour taste