**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per:\_\_\_\_\_\_**

Unit 9 Outline- Solutions, Acids & Bases

**Essential Skills/ State Standards:**

1. Describe the dissolving process at the molecular level between different types of substances:
* Polar, non-polar, and ionic
* Understand how some solutions become electrolytes
1. Calculate the concentration of a solution in terms of molarity
2. Explain the different properties of acids & bases by:
	* Identifying acids and bases using laboratory equipment
	* Using the pH scale to characterize acid and base solutions.
	* Diagramming the way strong acids/ bases differ from weak acids/ bases
	* Writing neutralization reactions

**Vocabulary**

|  |  |  |  |
| --- | --- | --- | --- |
| * + Solute
	+ Solvent
	+ Solution
	+ Solubility
	+ Dissolving process
 | * + Concentration
	+ Molarity
	+ Ionic
	+ Electrolyte
	+ Polar/non-polar
 | * + Acids
	+ Bases
	+ Salts
	+ Hydrogen ion
	+ Hydroxide ion
 | * + pH scale
	+ Dissociation
	+ Hydronium ion
 |

**Extra Credit Book Assignments**

|  |  |  |
| --- | --- | --- |
| **Topic** | **Read** | **Required Problems** |
| 1. The Solution Process
 | Section 13-2 P. 401-410 | **Section Review 13-2** p. 410 #1-3, 5 |
| 1. Concentration of Solutions
 | Section 13-3 p. 412-418 | **Chapter 13 Review** p. 421 #15-18 |
| 1. Properties of Acids & Bases
 | Section 15-1 p. 453-462  | **Section Review 15-1** p. 462 #1, 3-4 |
| 1. Determining pH & Titrations
 | Section 16-2 p. 493-503 | **Section Review 16-2** p. 503 #1-4 |

**Study Guide (Use notes, worksheets, and labs in addition to this study guide)**

1. Water is **polar**- draw a picture that demonstrates your understanding of this concept.
2. a. Explain why the **polarity** of water allows it to be such a good solvent.

b. What types of bonded substances (ionic, polar covalent, non polar covalent) dissolve easily in water?

1. Complete the following chart:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | KBr | C3H8 | C6H12O6 | HCl | NaOH |
| 1. Bond type
 |  |  |  |  |  |
| 1. Draw image that shows on the **MOLECULAR LEVEL** how each of these would dissolve in water
 |  |  |  |  |  |
| 1. Electrolytes? Explain.
 |  |  |  |  |  |
| 1. Acid/ Base/ Neutral?
 |  |  |  |  |  |

1. Given 16 g of sulfur dissolved in 250 mL of water calculate the molarity.
2. You need to make 500 mL of a 2M sulfur solution. How many grams of sulfur would you need to add to the water?

1. Identify the following substance as an acid or a base based on the following characteristics:
	1. reacts with Zn to form H2 gas bubbles
	2. pH= 9
	3. pH= 1
	4. conducts electricity
	5. turns phenolphthalein pink
	6. turns ph/ litmus paper blue
	7. turns ph/ litmus paper red
2. **Identify** the compound as an acid or base & explain how you’ d know:
	1. H2SO4 + H2O🡪 H3O + + HSO4-
	2. NH3 + H2O 🡪 OH- + NH4+
3. **Write** how the following would dissociate in H2O ***&*** determine if they are an **acid** or **base**:
4. HNO3  🡪
5. KOH 🡪
6. Draw a pH scale with the correct numbers **and** label where you’d find strong bases, weak bases, strong acids, weak acids, and neutral substances.
7. How does a **strong** acid/ base differ from a **weak** acid/ base?
8. a) Write the products of the following reaction: KOH + HNO3 🡪 \_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_
9. What special type of double replacement reaction is this?
10. Would this solution conduct electricity? How do you know?
11. Explain how to **neutralize** an acidic solution.