Name: _____ Period: ____ Date: _____

SOLUTIONS NOTES
HONORS CHEMISTRY

Directions: This packet will serve as your notes for this chapter. Follow along with the PowerPoint presentation and fill in the missing information. Important terms / ideas are in all capitals and bolded!

- **SOLUTION**:

Parts of Solutions	Definition / Examples
SOLUTE:	
SOLVENT:	

- Insoluble vs. Soluble

INSOLUBLE	SOLUBLE

-What factors influence solubility?:

- **AQUEOUS SOLUTION**:

-Two Types:

ELECTROLYTES	NONELECTROLYTES
Form _____, conduct electric current (ex: NaCl or $MgCl_2$) / _____	Do NOT form _____ or conduct electric current (ex: Sugar or Ethanol) / _____

-DISSOCIATION:

- Classification of Solutions

Type	Definition
SATURATED:	Contains _____ quantity of _____ that dissolves at that temperature
UNSATURATED:	Contains _____ than the maximum amount of _____ that can be dissolved
SUPERSATURATED:	Contains _____ than is possible to be dissolved by warming or evaporating (_____ and _____)

- **SOLUBILITY RULES**

Knowing whether compounds are soluble or insoluble from these rules tells you if a PRECIPITATE forms… which tells you IF a Double-Replacement Reaction happened or not!

Rule	Description	
#1	Salts of ammonium and alkali metals are always _____	**Relate to when compounds are SOLUBLE with exceptions**
#2	All chlorides, bromides, and iodides are _____ except when combined with Ag, Hg, and Pb which are _____	
#3	Chlorates, acetates, and nitrates are _____	
#4	Sulfates are _____ except with Ca, Sr, Ba, Ag, Hg, and Pb which are _____	
#5	Phosphates, carbonates, and sulfides are _____ except ammonium and alkali metal compounds are _____	**Relate to when compounds are INSOLUBLE with exceptions**
#6	All metallic oxides are _____ except ammonium and alkali metal compounds are _____	
#7	All hydroxides are _____ except ammonium, alkali metal compounds, and group 2A from Ca down are _____	

- Ex: $Mg(NO_3)_2$ (___) + 2 NaOH (___) ➔ $Mg(OH)_2$ (___) + 2 $NaNO_3$ (___)

Solubility Rules Practice	Indicate (*aq*) for soluble or (*s*) for insoluble
Classify each of the following as soluble or insoluble.	

- **NET IONIC EQUATIONS**:

  -SPECTATOR IONS:

Steps for Writing Net Ionic Equations:	1) Write the _____ equation 2) Rewrite the equation showing the _____ that form in solution for each _____ compound 3) Cancel _____ ions (ALL cancel = _____!) 4) Rewrite the final equation

  - Example:

Net Ionic Practice	**Show all work**
Predict the products (with solubility indicated), balance, and write the net ionic equation for each.	___K_2CO_3 (aq) + _____ (aq) ➔
	___$Ba(NO_3)_2$ (aq) + _____ (aq) ➔
	___Na_2S (aq) + _____(aq) ➔

- Concentration of Solutions

  -Reactions take place when two _____ are _____

  -In order to do stoichiometric calculations, the **CONCENTRATION** (_____ _____ must be known

  -A few ways to expression concentration…

- **MOLARITY (M)**:

  M =

Example	**Show all work, units, and Sig Figs**
Calculate the molarity of a solution when _____ g of NaOH is dissolved in enough water to make 1.5 liters of solution.	

- Practice

Examples	**Show all work, units, and Sig Figs**
How many liters of _____ M solution can be made using 125 grams of LiBr?	
What mass of oxalic acid, $H_2C_2O_4$, is needed to make _____ mL of a 0.0500 M solution?	
What is the concentration of a solution that has a volume of _____ L and contains 660 g of $Ca_3(PO_4)_2$?	

- **MASS or VOLUME %**

  % by Mass (g) OR % by Volume (mL) =

Example	**Show all work, units, and Sig Figs**
What is the percent concentration of _____ g of NaCl dissolved in 350.0 g of water?	

- Preparing Solutions

  -STEP 1: To make a certain concentration of solution, the _____ should be weighed out first and then placed in a _____ flask

  -STEP 2: Dissolve the _____ in SOME of the _____ then add the remaining solvent

  -To save space, time, and money _____ / _____ solutions are often purchased

  -Water is then added to _____ the stock solutions to the desired concentration

  -Moles of solute _____ = Moles of solute _____ (no solute is added during a dilution)

  -How much _____ needs to be added?...

- **DILUTIONS**

  -EQUATION:

Examples	**Show all work, units, and Sig Figs**
What volume of ____ M H_2SO_4 must be used to prepare 1.5 L of 0.10 M solution?	
How many mL of stock solution should be used to prepare _____mL of 0.750 M NaBr solution using 2.00 M stock solution?	

- Solution Stoichiometry

Steps for Stoichiometry with Solution Reactions:	1) Write and balance the equation 2) Determine _____ (use the rules) 3) Determine the _____ of each reactant and find the _____ (if needed) 4) Find amount of product **Depending on _____ given, some steps can be _____!!**

- Solution Stoichiometry Examples

Examples	**Show all work, units, and Sig Figs**
How many grams of $Ca(OH)_2$ are required to react with _____ mL of 0.40 M HCl? Show the balanced equation.	
Calculate the mass of solid formed when _____ L of 0.050 M lead (II) nitrate and 2.0 L of 0.025 M sodium sulfate are mixed.	
If 625 mL of _____ M aluminum chloride is mixed with 245 mL of _____ M sodium sulfide, how many grams of the precipitate will form AND what is the concentration of EACH ion of the excess reagent that remains in solution after the reaction?	