**Unit 3 & 4 Review Packet Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Write the general formula for the 5 types of synthesis reactions (parts 1-4 in notes).
2. Write the general formula for the 4 types of decomposition reactions (parts 1-2 in notes).
3. Review and understand the specific synthesis & decomposition reactions covered in the notes.
4. Write the general formula for the 3 types of single displacement reactions.
5. Explain how to determine whether a SD reaction will occur or not.
6. Write the general formula for the 4 types of double displacement reactions (precipitation, strong acid/strong base, strong acid/carbonate, and strong acid/weak base).
7. Explain how to determine whether a double displacement reaction will occur or not.
8. Write the general formula for the 2 types of combustion reactions.
9. Compare and contrast dissolution, ionization, and dissociation.
10. Know the role and importance of total ionic and net ionic equations. (Include simplifying equations in your answer)
11. Identify the solubility of the following ionic species:
12. Li+, Na+, K+, Rb+, Cs+, Fr+
13. NH4+
14. Cl-, Br-, I-
15. CO32-
16. SO42-
17. PO43-
18. NO3-
19. C2H3O2-
20. Relate electrolytes to the concept of solubility.
21. Diagram how the following molecules would be dissolved by water.

Potassium Iodide Ethanol (C2H5OH)

 **KI**

1. Identify the 6 strong acids and rule for determining strong bases.
2. Relate strong acids and bases to solubility.
3. Predict the products of and balance the following reactions. If no reaction occurs, write “no rxn”.
4. \_\_\_\_ NaBr + \_\_\_\_ H3PO4

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ Ca(OH)2 + \_\_\_\_ Al2(CO3)3

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ Mg + \_\_\_\_ Fe2O3

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ C2H4 + \_\_\_\_ O2

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ PbSO4

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ NH3 + \_\_\_\_ I2

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ H2O + \_\_\_\_ SO3

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_P4O6 + \_\_\_\_ H2O

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ H2SO4 + \_\_\_\_ NH4OH

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ Fe + \_\_\_\_ H2O

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ (NH4)2CO3

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ Na2O + \_\_\_\_H2O

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ C3H8 + \_\_\_\_O2

Type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. For the following problems, write the molecular, total ionic and net ionic equations for the reaction described. Solve for the requested value.
2. 13.9g of ammonia gas is bubbled through 1.80M hydrochloric acid.
3. How many milliliters of acid would be required to completely react the ammonia?
4. How many grams of salt would be produced if the ammonia is completely reacted?
5. 25.0mL of 1.44M sodium hydroxide is spilled on the lab bench and neutralized with 0.885M sulfuric acid.
6. If 13.4 mL of sulfuric acid are used to neutralize the spill, how many grams of water will be produced?
7. If the 13.4 mL of sulfuric acid were used, is the final solution neutral? If yes, use a calculation to show neutrality. If no, support with a calculation that shows how many mL of the limiting reagent should be added to get to neutral.
8. 15.0 g of magnesium is placed into a solution of silver nitrate.
9. If the volume of solution is 130.0mL, what would be the minimum concentration required to completely react the magnesium?
10. If the concentration of the solution is actually 0.015M silver nitrate, how much solid product will be produced?
11. A lab procedure requires 500.0mL of a 0.350M sodium acetate solution. Describe the steps you would take to make this solution from a 3.00M sodium acetate solution.
12. Discuss and relate the following concepts: standard curve, absorbance, concentration.
13. Reference the following absorption spectrum to answer questions a & b.
	1. What wavelength would you choose to analyze the Congo Red?
	2. Explain why a solution of malachite green and methylene blue would be difficult to analyze.
14. Use the following standard curve to answer questions a & b.



1. Identify 2 “flags” that would cause you to not trust the standard curve.

R2 = 0.879

1. Assuming the curve is reliable, what concentration would an unknown bromothemal blue solution have if it elicits an absorbance of 1.40?
2. An unknown bromothemal blue solution gives an absorbance of 2.45. What could be done to determine the concentration of the solution?