**Unit 4 Study Guide**

Section 1: Chemical vs Physical Changes

1. What is a physical change?
2. What are 3 signs that a physical change occurred?
3. What is a chemical change?
4. What are 6 signs that a chemical change occurred?

*Tell me if the following is a Physical or Chemical Change:*

1. Vinegar and baking soda volcano 9. Cutting a steak
2. Ice cream melting 10. Burning paper
3. Crushing a car 11. Rust forming
4. Breaking a bone in your arm 12. Crushing a Can

Section 2: Questions

1. What is a product?

1. What is a reactant?
2. What does a subscript represent within an equation?
3. What does the coefficient represent in an equation?
4. Do you change the subscript or the coefficient when you are balancing an equation?
5. What is an endothermic reaction?
6. What is an exothermic reaction?

Section 3: Balance and Identify the type of reaction

Identify the following reactions as:

addition, decomposition, combustion, single displacement, double displacement, or acid base reaction:

20. \_\_Na3PO4 + \_\_KOH 🡪 \_\_NaOH + \_\_K3PO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21. \_\_MgCl2 + \_\_Li2CO3 🡪 \_\_MgCO3 + \_\_LiCl \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. \_\_C6H12 + \_\_O2 🡪 \_\_CO2 + \_\_ H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23. \_\_Pb + \_\_FeSO4 🡪 \_\_PbSO4 +\_\_Fe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

24. \_\_CaCO3 🡪\_\_CaO + \_\_CO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

25. \_\_P4 + \_\_O2 🡪 \_\_P2O3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

26. \_\_HCl + \_\_NaOH 🡪 \_\_NaCl + \_\_H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

27. \_\_AgNO3 + \_\_Cu 🡪 \_\_Cu(NO3)2 + \_\_Ag \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

28. \_\_C3H6O + \_\_O2 🡪 \_\_CO2 + \_\_H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

29. \_\_C5H5 + \_\_Fe 🡪 \_\_Fe(C5H5)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

30. \_\_SeCl6 + \_\_O2 🡪 \_\_SeO2 + \_\_Cl2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

31. \_\_MgI2 + \_\_ Mn(SO3)2 🡪 \_\_MgSO3 + \_\_MnI4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

32. \_\_H2SO4 + \_\_NH4OH 🡪 \_\_ (NH4)2SO4 + \_\_H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

33. \_\_ NO2 🡪 \_\_O2 + \_\_N2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

34. \_\_ C6H6 + \_\_ O2 🡪 \_\_ H2O + \_\_ CO2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

35. \_\_ NaI + \_\_ Pb(SO4)2 🡪 \_\_ PbI4 + \_\_ Na2SO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

36. \_\_ NH3 + \_\_ O2 🡪\_\_ NO + \_\_ H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

37. \_\_ Fe(OH)3 🡪 \_\_ Fe2O3 + \_\_ H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

38. \_\_ HNO3 + \_\_ Mg(OH)2 🡪 \_\_H2O + \_\_ Mg(NO3)2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

39. \_\_ H3PO4 + \_\_ NaBr 🡪 \_\_ HBr + \_\_ Na3PO4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

40. \_\_ C + \_\_ H2 🡪 \_\_ C3H8 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[[HONORS ONLY]] Section 4: Translating Equations

Classify and translate the following equations. Then tell me if the equation is balanced.   
DO NOT TRY TO BALANCE IF IT IS UNBALANCED.

1. What are the 7 diatomic molecules?
2. What is special about diatomic molecules when we transcribe an equation?
3. potassium chloride + cesium 🡪 cesium chloride + potassium  
    Type of reaction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Is it balanced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

44. lithium chloride + sodium bromide 🡪 lithium bromide + sodium chloride  
 Type of reaction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Is it balanced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

45. iron metal is added to copper(II) oxide to yield iron(II) oxide and copper metal  
 Type of reaction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Is it balanced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

46. aluminum metal is mixed to copper(III) chloride to produce aluminum chloride and copper metal  
 Type of reaction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Is it balanced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

47. sodium metal is mixed to copper(II) chloride to produce sodium chloride and copper metal  
 Type of reaction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Is it balanced? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_