CHEMISTRY | LEE

NAME ____

DATE _________________________ BLOCK __________

UNIT TWO

PROBLEM SET

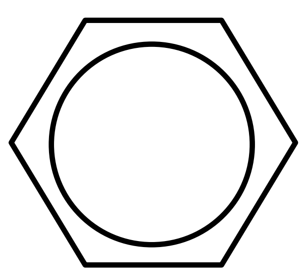
Score:

Do not cheat by copying the work of another person, or by allowing another person to copy your answers. Cheating results in a 0% grade for both parties involved.

Signature_________________________________ Date__________

In the event any or all of this Problem Set is assessed for a grade,
it <u>must be signed and dated</u> in order to receive a grade. The work shall be your own.

Problem Sets are generally not accepted late. Late assignments are 50% off.



Name: ________________________________ Date: __________________

CH. 5 WORKSHEET 1: ATOMIC STRUCTURE PRACTICE

1. What is the atomic number of sodium?

2. How many protons does sodium have?

3. How many electrons does a neutral atom of sodium have?

4. How many protons in the nucleus of a potassium atom?

5. How many electrons in a neutral potassium atom.

6. Using the periodic table, complete the following table.

ISOTOPE	ATOMIC #	# PROTONS	# NEUTRONS	# ELECTRONS	MASS #
^{13}C					
	17		18		
		26			56
		17			37
			2		3
	52				128
		50	70		

7. How many protons, neutrons and electrons are in lead-207?

9. How many protons, neutrons and electrons are in ^{197}Au?

10. Give the isotope symbol for an atom with 40 protons, 40 electrons, and 53 neutrons. _________.

11. Which is the difference between Lead-206 and Lead-207 in terms of subatomic particles?

Abundance of Isotopes
Chem Worksheet 4-3

Name ________________

The **atomic mass** for each element is reported on the periodic table. This number is a weighted average of the masses of each of the isotopes of an element. For example, the atomic mass of carbon is reported as 12.011 amu. Carbon is composed primarily of two isotopes: carbon-12 and carbon-13. The atomic mass is calculated from the relative abundance and the masses for these two isotopes. Using the equation below we can calculate the atomic mass for carbon.

6
C
12.011 ← Atomic mass
carbon

$$\text{Atomic Mass} = \%\ \text{isotope } 1 \times \text{mass isotope } 1 \ + \ \%\ \text{isotope } 2 \times \text{mass isotope } 2 \ + \ \ldots$$

Carbon-12 makes up 98.93% of all of the carbon atoms, while carbon-13 is about 1.07% abundant. Since the carbon-12 isotope is more abundant, its mass is weighted more in the calculation of carbon's atomic mass. An example calculation is done below.

Isotope	% Abundance	Mass
Carbon-12	98.93%	12.000 amu
Carbon-13	1.07%	13.003 amu

Example

What is the atomic mass (the weighted average mass) for carbon?

- substitute values in equation: (convert % to decimals) — atomic mass = (0.9893)×(12.000amu) + (0.0107)×(13.003amu)

- calculate: — atomic mass = 12.01 amu

Use the equation for atomic mass to answer the following questions.

1. Argon has three naturally occurring isotopes: argon-36, argon-38, and argon-40. Based on argon's reported atomic mass, which isotope do you think is the most abundant in nature? Explain.
2. Copper is made of two isotopes. Copper-63 is 69.17% abundant and it has a mass of 62.9296 amu. Copper-65 is 30.83% abundant and it has a mass of 64.9278 amu. What is the weighted average mass of these two isotopes?
3. Calculate the atomic mass of silicon. The three silicon isotopes have atomic masses and relative abundances of 27.9769 amu (92.2297%), 28.9765 amu (4.6832%) and 29.9738 amu (3.0872%).
4. Gallium has two naturally occurring isotopes. The mass of gallium-69 is 68.9256 amu and it is 60.108% abundant. The mass of gallium-71 is 70.9247 amu and it is 39.892% abundant. Find the atomic mass of gallium.
5. Bromine has two naturally occurring isotopes. Bromine-79 has a mass of 78.918 amu and is 50.69% abundant. Using the atomic mass reported on the periodic table, determine the mass of bromine-81, the other isotope of bromine.
6. Calculate the atomic mass of lead. The four lead isotopes have atomic masses and relative abundances of 203.973 amu (1.4%), 205.974 amu (24.1%), 206.976 amu (22.1%) and 207.977 amu (52.4%).
7. Antimony has two naturally occurring isotopes. The mass of antimony-121 is 120.904 amu and the mass of antimony-123 is 122.904 amu. Using the average mass from the periodic table, find the abundance of each isotope. (Remember that the sum of the two abundances must be 100).

Chapter 5 Worksheet 2: Isotopes and Average Atomic Mass

Elements come in a variety of isotopes, meaning they are made up of atoms with the same atomic number (number of protons) but different atomic mass numbers. These atoms differ in the number of neutrons.

The average atomic mass is the weighted average of all the isotopes of an element.

Example: A sample of cesium is 75% Cs-133, 20% Cs-132, and 5% Cs-134. What is its average atomic mass?

Answer	0.75 x 133 =	99.75
	0.20 x 132 =	26.4
	0.05 x 134 =	6.7
	Total	132.85 amu

Guided Practice: Jason is in AP Psychology. Tests are 40% of his grade, projects are 25% of his grade, HW is 15% of his grade, and the rest of this grade comes from quizzes. Here's what he has for each category:
His average test grade is 93. His average project grade is 75.
His average quiz grade is 68. His average HW grade is 84.
What is his grade in the class?

Determine the average atomic mass of the following mixtures of isotopes

1. 80% Iodine-127 17% Iodine-126, 3% Iodine-128

2. 50% ^{197}Au, 50% ^{198}Au

3. 15% Iron-55, 85% Iron-56

4. An newly-discovered element (Ux) has the following isotope abundances in a parallel universe: 44% Ux-220, 19% Ux-223, and 25% Ux-224, and the remainder is Ux-226. What is the average atomic mass that should be reported for this element?

5. Naturally occurring lead is found to have the following isotopic relative abundance. ^{204}Pb 3%, ^{206}Pb 24%, ^{207}Pb 20% and ^{208}Pb 53%. Calculate the average relative atomic mass of Pb from the data.

Chapter 6 Worksheet 1: Naming Binary Ionic Compounds

Complete this table by writing the correct formulas for the compounds formed by the anions and cations.

	Cl^-	N^{3-}	S^{2-}
Ca^{2+}			
K^+			
Sn^{4+}			
Al^{3+}			

Write the Formula

1. Lithium chloride
2. Sodium oxide
3. Calcium Iodide
4. Tin(IV)nitride
5. Zinc chloride
6. Cadmium selenide
7. Iron(III)sulfide
8. Lead(II)fluoride
9. Chromium(III)nitride
10. Manganese(III)bromide
11. Cobalt(II)oxide
12. Aluminum sulfide
13. Mercury(II)chloride
14. Magnesium nitride
15. Copper(II)phosphide

Write the Name

1. KBr
2. $PbCl_2$
3. Ag_2O
4. Cu_2S
5. Al_2S_3
6. SnO_2
7. $ZnCl_2$
8. $HgBr$
9. Cr_2O_3
10. $FeCl_3$
11. Sn_3P_4
12. MgO
13. $CoBr_2$
14. Zn_3N_2
15. CaF_2

Chapter 6 Worksheet 2: More Naming Binary Ionic Compounds

Complete this table by writing the correct formulas for the compounds formed by the anions and cations.

	P^{3-}	O^{2-}	F^{-}
Fe^{3+}			
Na^{+}			
Pb^{4+}			
Mg^{2+}			

Write the Formula

16. Sodium Bromide

17. Calcium nitride

18. Cobalt(II) bromide

19. Chromium (VI) phosphide

20. Potassium sulfide

21. Lithium oxide

22. Iron (III) chloride

23. Lead(IV) sulfide

24. Silver chloride

25. Zinc oxide

26. Manganese(VI) oxide

27. Copper(II)selenide

Write the Name

16. $BaCl_2$

17. Al_2O_3

18. ZnO

19. LiBr

20. Fe_2S_3

21. Na_2S

22. PbF_4

23. Ca_3N_2

24. V_2O_5

25. Cu_2S

26. TiO_2

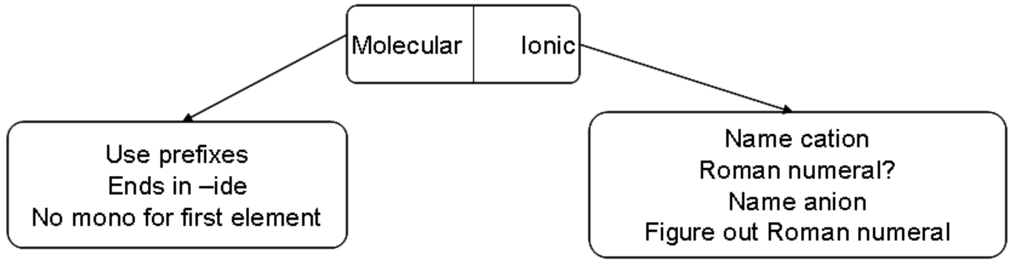
27. $MgBr_2$

Chapter 6 Worksheet 3: Names and Formulas of Molecular Compounds

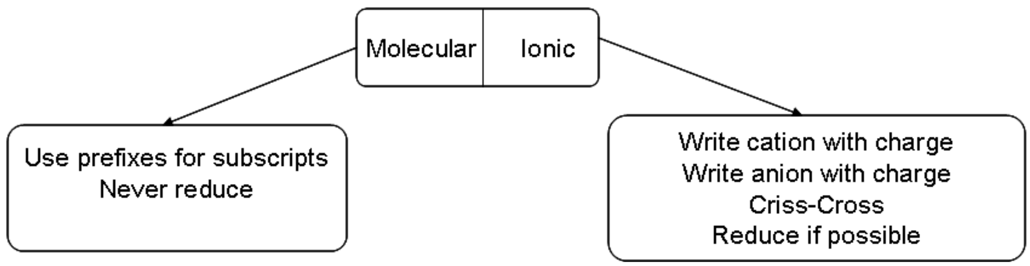
Write the Formula	**Write the Name**
1. Boron trichloride	11. P_2O_4
2. nitrogen monoxide	12. NCl_3
3. dinitrogen dioxide	13. CO
4. nitrogen trioxide	14. SO_3
5. diphosphorus pentoxide	15. PBr_5
6. silicon dioxide	16. SO_2
7. carbon dioxide	17. SiI_4
8. silicon tetrafluoride	18. CCl_4
9. selenium dibromide	19. B_2F_6
10. carbon tetrachloride	20. $AsCl_3$

Ch 6 Worksheet 4: Mixed Formula ⇆ Name Practice for Binary Compounds

Formula to Name



Name to Formula



Decide if the compound is ionic or molecular and then answer accordingly.

Write the Formula	**Write the Name**
1. sulfur dichloride	10. $CaBr_2$
2. titanium(IV)oxide	11. Na_2O
3. copper(III)sulfide	12. CS_2
4. phosphorus dioxide	13. MgO
5. potassium phosphide	14. P_2S_4
6. mercury(I)oxide	15. CrP_2
7. gold(III)chloride	16. Al_2O_3
8. sodium nitride	17. CCl_4
9. dinitrogen tetroxide	18. PbS

Ch 6 WS 5: More Mixed Binary Compound Naming Practice

Name the following

1. Ba_3P_2 ______________________________
2. FeO ______________________________
3. SiO_2 ______________________________
4. $CuCl_2$ ______________________________
5. Mn_2O_5 ______________________________
6. $NaCl$ ______________________________
7. NF_3 ______________________________
8. MgO ______________________________
9. CaF_2 ______________________________
10. NiS ______________________________
11. CO_2 ______________________________
12. Cr_2O_3 ______________________________
13. $AlCl_3$ ______________________________
14. P_2O_4 ______________________________
15. OF_2 ______________________________
16. PbS_2 ______________________________
17. $LiBr$ ______________________________
18. ZnO ______________________________
19. Ag_2S ______________________________
20. K_3N ______________________________

Ch 6 WS 5 Continued

Write the formulas for the following compounds

1. Zinc phosphide ______________________
2. Calcium chloride ______________________
3. Nitrogen dioxide ______________________
4. Diphosphorus pentoxide ______________________
5. Sulfur hexachloride ______________________
6. Iron(III) bromide ______________________
7. Potassium iodide ______________________
8. Chromium(VI) sulfide ______________________
9. Aluminum sulfide ______________________
10. Magnesium bromide ______________________
11. Silicon dioxide ______________________
12. Lead(II) oxide ______________________
13. Arsenic trichloride ______________________
14. Manganese(II) bromide ______________________
15. Silver sulfide ______________________
16. Copper(II)oxide ______________________
17. Barium chloride ______________________
18. Cadmium oxide ______________________
19. Silicon tetrafluoride ______________________
20. Lithium nitride ______________________

Ch 6 WS 6: More Mixed Binary Compound Naming Practice

Name the following

1. Li_2O ____________________
2. AlP ____________________
3. P_2O_5 ____________________
4. $MgCl_2$ ____________________
5. Fe_2O_3 ____________________
6. ZnS ____________________
7. NS_2 ____________________
8. NaCl ____________________
9. MgS ____________________
10. N_2O_4 ____________________
11. Cu_2O ____________________

Write the formulas for the following compounds

1. Nickel(III) chloride ________________
2. Iron(II)oxide ________________
3. Magnesium nitride ________________
4. Iodine pentafluoride ________________
5. Silver sulfide ________________
6. Sodium phosphide ________________
7. Aluminum bromide ________________
8. Carbon monoxide ________________
9. Copper(II) sulfide ________________
10. Magnesium nitride ________________

Name______________ Block_____

Chapter 7 WS 1b: Mole to Particle Count Conversion

1 mole = 6.02 x10^{23} representative particles (atoms, molecules, formula units)

$$\frac{1\text{ mol}}{6.02 \times 10^{23}\text{ rep. part}} = \frac{6.02 \times 10^{23}\text{ rep. part.}}{1\text{ mol}}$$

Example: How many molecules of F_2 are in 0.0041 moles of F_2?

$$0.0041\text{ mol }F_2 \times \frac{6.02 \times 10^{23}\text{ molec. }F_2}{1\text{ mol }F_2} = 2.4682 \times 10^{21} \approx \boxed{2.4 \times 10^{21}\text{ molec. }F_2}$$

1. How many moles are in 6.8 x 10^{30} molecules of nitrogen, N_2?(Ans = 1.1 x 10^{7}mol)

2. How many molecules are in 98 moles of carbon dioxide, CO_2?(Ans = 5.9 x 10^{25} molec.)

3. How many moles are in 8.0 x 10^{20} formula units of sodium chloride, NaCl?(Ans = 0.0013 mol)

4. How many formula units are in 283 moles of calcium chloride, $CaCl_2$?(Ans = 1.70 x 10^{26} f.u.n)

5. How many atoms are in 3.0 moles of gold, Au?(Ans = 1.8 x 10^{24} atoms)

Name__________________________ Block____

Chapter 7 Worksheet 2: Molar Mass Practice

Molar mass, or gram formula mass, is calculated using the periodic table. Sum the molar masses of all the compounds elements to find the molar mass.

Example: Find the molar mass of Pb(CO3)2

(297.2) + (2 x 12.011) + (6 x 16.00) = $\boxed{417.222\ g}$
1 Pb + 2 C + 6O

1. $AlBr_3$
2. $NaClO_3$
3. Fe_2O_3
4. NaOH
5. $CaCO_3$
6. $Zn(NO_3)_2$
7. K_2SO_4
8. Li_2S
9. $NiCl_3$
10. $Mg(ClO)_2$

1: $AlBr_3$ (266.7 g), 2: $NaClO_3$ (106.4 g), 3: Fe_2O_3 (159.7 g), 4: NaOH (40.0 g), 5: $CaCO_3$ (100.1 g), 6: 189.4 g, 7: 174.3 g, 8: 45.9 g, 9: 165.0 g, 10: 127.2 g (note formula weights given to nearest 0.1 gram to account for rounding differences—don't worry if you're off by 0.1 gram)

Name______________________ Block______

Chapter 7 Worksheet 3: Molar Mass ⇆ Mole Practice

1. How many moles of sodium bromide, $NaBr$, are equivalent to 640 grams of $NaBr$?(Ans = 6.2 mol)

2. The maintenance staff at Warhill used 31 moles of calcium chloride, $CaCl_2$, to de-ice the entrance to the school after a snow fall. How many grams of calcium chloride did they use?(Ans = 3400 g)

3. A box of baking soda ($NaHCO_3$) contains 476 grams of product. How many moles of baking soda does the box contain?(Ans = 5.67 mol)

4. A farmer decides to use 2.0×10^4 grams of ammonium nitrate, NH_4NO_3, to fertilize a small field. How many moles of ammonium nitrate will the farmer use?(Ans = 2.5×10^2 mol)

5. A salt lover poured 0.19 moles of table salt ($NaCl$) on her French Fries. How many grams of salt did she just put on her fries?(Ans = 11g)

Ch 7 WS 3 Continued

6. A car's gas tank hold 3.6 x 10^4 grams of octane (C_8H_{18}). How many moles of octane does the gas tank hold?(Ans = 320 mol

7. A chemical reaction requires using 11.3 moles of ammonium phosphate, $(NH_4)_3PO_4$. How many grams of ammonium phosphate will be used?(Ans = 1690 g)

8. A 5.00 ml dose of Emetrol (anti-nausea medication) contains $2.15x_{10}^{-2}$ g of phosphoric acid, H_3PO_4. How many moles of H_3PO_4 are in each 5 ml dose?(Ans = $2.19x10^{-4}$mol)

9. You are very thirsty and consume 28 moles of water. How many grams of water did you just drink? (Ans = 5.0 x 10^2 g H_2O)

Name_________________________ Block____

Chapter 7 Worksheet 4: Molar Volume ⇆ Mole Practice

1 mole = 22.4 liters gas at STP = 6.02 x10^{23} representative particles = molar mass, grams

1. How many mole of chlorine gas are in a 14 liter cylinder at STP?(Ans = 0.63 mol)

2. A 0.500 Liter laboratory flask is filled with argon. How many moles of Argon does the flask contain at STP?(Ans = 0.0223 mol)

3. A weather balloon contains 53 moles of helium. What is the volume of the balloon in liters at STP?(Ans = 1200 L)

4. A cow gives off methane gas, CH_4, every time it belches. How many liters of methane gas did a cow's 1.2 mole belch produce at STP? (We'll assume the entire belch was methane.) (Ans = 27 L)

Review questions:

5. How many grams of methane are in 1.2 moles of methane, CH_4?(Ans = 19 g)

6. How many molecules of methane are in 1.2 moles of methane?(Ans = 7.2 x 10^{23} molec)

Name___________________________ Block_____

Chapter 7 Worksheet 5: Mixed Mole Practice Problems

1 mole = 22.4 L gas (at STP) = molar mass = 6.02 x 10^{23} rep. part.

1. Convert 6.0 moles of lithium oxide, Li_2O, to formula units

2. How many grams of magnesium sulfate are in 5.000 moles of $MgSO_4$?

3. What would be the volume in liters of a balloon containing 4.38 moles of He at STP?

4. What is the density in g/L of Argon gas?

5. How many grams are in 2.0 x 10^{24} molecules of nitrogen dioxide, NO_2?

6. What volume would 2.0 x 10^{24} molecules of nitrogen dioxide occupy?

7. A sample of carbon dioxide gas, CO_2, occupies 60.0 liters at STP. How many molecules is this?

8. What is the mass of 60.0 liters of carbon dioxide?

9. A 6.0 grams sample of nitrogen gas, N_2, is in a container at STP. What volume is this container?

Chapter 7 Worksheet 5 Continued

10. How many molecules of nitrogen are in 6.0 grams of nitrogen gas, N_2? How many atoms of nitrogen?

11. How many formula units of lithium chloride are in a 3.2 gram crystal of LiCl?

12. What is the difference between a formula unit and a molecule?

13. What is the temperature and pressure at STP?

14. What is the similarity between a dozen and a mole?

Answers:1: 3.6×10^{24}, 2: 601.9 g, 3: 98.1 L, 4: 1.78 g/L, 5: 150 g, 6: 74 L, 7: 1.61×10^{24} molec., 8: 118 g, 9: 4.8 L, 10: 1.3×10^{23} molec. N2, 2.6×10^{23} atom N, 11: 4.5×10^{22} f.u.n. LiCl

Name	Date	Block

Ch 7 WS 6: More Mixed Mole Practice Problems

1. Calculate the mass in grams of 1.058×10^{24} formula units of $CaCl_2$.(Ans = 195.0 g)

2. Calculate the mass in grams of 45.31 L of CH_4 at STP(Ans = 32.44 g)

3. Calculate the volume in liters of 2.0×10^{22} molecules of NO_2 at STP(Ans = 0.74 L)

4. Calculate the <u>number of atoms</u> in 62.7 L of CO_2 at STP.(Ans = 5.06×10^{24})

Ch 7 WS 6 Worksheet Continued

5. Cobalt metal is added to steel to improve its resistance to corrosion. Calculate the number of moles of cobalt in 5.00×10^{20} atoms of Cobalt.(8.31×10^{-4} mol)

6. Isopentyl acetate ($C_7H_{14}O_2$), is the compound responsible for the scent of bananas. Bees release about 1×10^{-6} gram of this compound when they sting. The resulting banana scent attracts other bees to join the attack. How many molecules of isopentyl acetate are released in a typical bee sting? I'm thinking I won't eat bananas near a bee hive!(5×10^{15} molecules)

7. Vitamin pills contain copper (III) oxide to provide the trace amounts of copper needed by the body. If each vitamin pill contains 3.0 milligrams of copper (III) oxide, how many copper atoms are in each vitamin pill? Hint: remember to convert milligrams to grams.(2.06×10^{19} atoms)

8. The Hindenburg blimp had a hydrogen gas, H_2, capacity of 140,000,000 liters. How many grams of hydrogen were required to fill the Hindenburg? Yes, this is the blimp that crashed and burned so famously.(Ans = 1.3×10^7 g)

Mole Conversion Practice

1. How many grams are in 18 L of Helium gas at STP?(Ans = 3.2 g He)

2. How many molecules of PCl_3 are in 7.8 grams of PCl_3?)(Ans = 3.4×10^{22} molec. PCl_3)

3. How many atoms of Neon are in a 15 L balloon of Neon at STP?(Ans = 4.0×10^{23} atom Ne)

4. How many formula units of NaBr are in 6.8 moles of NaBr?(Ans = 4.1×10^{24} NaBr f.u.n.)

5. How many grams of Lithium are in 8.2 moles of Lithium?(Ans = 57 g Li)

6. Convert 19 Liters of Argon, Ar, to grams of Argon at STP.(Ans = 34 g Ar)

7. Convert 3.4×10^{20} molecules of NO_2 to grams of NO_2.(Ans = 0.026 g NO_2)

8. Convert 16.0 grams of O_2 to Liters of O_2 at STP.(Ans = 11.2 L O_2)

9. Convert 4.5 moles of Si to atoms of Si.(Ans = 2.7×10^{24} Si atoms)

10. Convert 34 Liters of F_2 gas to grams of F_2 gas at STP.(Ans = 58 g F_2)

Chapter 8 WS 1: Word Equations

Write the word equations below as skeleton chemical equations.

Example: Solid sodium bromide and fluorine gas react to form solid sodium fluoride and liquid bromine.

$$NaBr(s) + F_2(g) \rightarrow NaF + Br_2(l)$$

1. Copper metal solid is heated with oxygen gas to form copper(II)oxide.

2. Aqueous iron(III) chloride reacts with aqueous sodium sulfide to yield solid iron(III) sulfide and aqueous sodium chloride

3. Aluminum metal reacts with aqueous copper(II)chloride to yield aqueous aluminum chloride and solid copper.

4. Solid Carbon reacts with oxygen gas to produce carbon dioxide gas.

Chapter 8 WS 1: Word Equations Continued

5. When heated, dinitrogen tetroxide gas decomposes to nitrogen gas and oxygen gas.

6. Solid Iodine reacts with gaseous fluorine to form liquid iodine pentafluoride.

7. Aqueous magnesium fluoride reacts with aqueous calcium bromide to form solid calcium fluoride and aqueous magnesium bromide.

8. Silver metal reacts with aqueous zinc chloride to form solid silver chloride and zinc metal.

Name ______________________ Period __________ Date __________

Ch 8 WS 2

C.1 SUPPLEMENT: KEEPING TRACK OF ATOMS

Fill-in-the-Blanks

1. A chemical equation is balanced if there are ______________ of each kind of ______________ on both sides of the equation.

2. Before looking at equations, determine the number of atoms of each kind in each of the following:

   a. $CaCO_3$ = ____Ca, ____C, ____O

   b. $(NH_4)_2SO_4$ = ____N, ____H, ____S, ____O

   c. $3\ H_2$ = ____H

   d. $4\ Mg(OH)_2$ = ____Mg, ____O, ____H

   e. $Ba(NO_3)_2$ = ____Ba, ____N, ____O

3. Now look at the equations. Count the number of atoms of each kind on each side of the following and determine if the statement is a balanced equation.

   a. $2\ Na + 2\ H_2O \longrightarrow 2\ NaOH + H_2$

Reactants		Products
________	Na	________
________	H	________
________	O	________

Balanced? Yes ______ No ______

   b. $4\ NH_3 + 6\ NO \longrightarrow 5\ N_2 + 6\ H_2O$

Reactants		Products
________	N	________
________	H	________
________	O	________

Balanced? Yes ______ No ______

4. For each of the following, show the number of each type of atom on each side of the reaction. Decide if the chemical equation is balanced or not.

   a. $NaCl + F_2 \longrightarrow NaF + Cl_2$

________	Na	________
________	Cl	________
________	F	________

Balanced? Yes ______ No ______

b. $3\ NaBr + H_3PO_4 \longrightarrow 2\ HBr + Na_3PO_4$ Balanced? Yes ______ No ______

______	Na	______
______	Br	______
______	H	______
______	P	______
______	O	______

c. $N_2H_4 + N_2O_4 \longrightarrow 3\ N_2 + 4\ H_2O$ Balanced? Yes ______ No ______

d. $4\ Ag + 4\ H_2S + O_2 \longrightarrow 2\ Ag_2S + 4\ H_2O$ Balanced? Yes ______ No ______

e. $2\ Bi + 3\ F_2 \longrightarrow 2\ BiF_3$ Balanced? Yes ______ No ______

f. $Al + Ni(NO_3)_2 \longrightarrow Al(NO_3)_3 + Ni$ Balanced? Yes ______ No ______

g. $3\ NaBH_4 + 4\ BF_3 \longrightarrow 2\ B_2H_6 + 3\ NaBF_4$ Balanced? Yes ______ No ______

h. $4\ C_3H_5(NO_3)_3 \longrightarrow 6\ N_2 + O_2 + 12\ CO_2 + 10\ H_2O$ Balanced? Yes ______ No ______

i. $Ca_{10}F_2(PO_4)_6 + 7\ H_2SO_4 \longrightarrow 2\ HF + 3\ Ca(H_2PO_4)_2 + 7\ CaSO_4$

Balanced? Yes ______ No ______

Ch 8 WS 3 Simple Balancing Equations

Use coefficients to balance each equation.

___Na + ___ $MgF_2 \rightarrow$ ___NaF + ___Mg

___Mg + ___HCl $\rightarrow$ ___$MgCl_2$ + ___H_2

___Cl_2 + ___KI $\rightarrow$ ___KCl + ___I_2

___NaCl $\rightarrow$ ___Na + ___Cl_2

___Na + ___$O_2 \rightarrow$ ___Na_2O

___Na + ___HCl $\rightarrow$ ___H_2 + ___NaCl

___K + ___$Cl_2 \rightarrow$ ___KCl

Name_______________________________ Block_______

Ch 8 WS 4: Balancing Chemical Equations

Balance the equations below:

1) ____ N_2 + ____ H_2 → ____ NH_3

2) ____ $KClO_3$ → ____ KCl + ____ O_2

3) ____ Fe + ____ O_2 → ____ Fe_2O_3

4) ____ H_2 + ____ O_2 → ____ H_2O

5) ____ CH_4 + ____ O_2 → ____ CO_2 + ____ H_2O

6) ____ C_3H_8 + ____ O_2 → ____ CO_2 + ____ H_2O

7) ____ C_8H_{18} + ____ O_2 → ____ CO_2 + ____ H_2O

Name________________________________

Block_______

Ch 8 WS 5: More Balancing Chemical Equations

Balance the equations below:

1) ____ P + ____O_2 → ____P_2O_5

2) ____ Al + _____Fe_2O_3 → ____ Fe + ____Al_2O_3

3) ____ S_8 + ____O_2 → ____ SO_3

4) ____ CO_2 + ____ H_2O → ____ $C_6H_{12}O_6$ + ____O_2

5) ____ K + ____ MgBr → ____ KBr + ____ Mg

6) ____ C_2H_6O + ____ O_2 → ____CO_2 + ____ H_2O

7) ____ H_2O + ____ O_2 → ____ H_2O_2

8) ____ NaBr + ____ CaF_2 → ____ NaF + ____ $CaBr_2$

Ch 8 WS 6: Still More Balancing Chemical Equations

Balance the equations below:

1) ____ C_2H_6 + ____$O_2 \rightarrow$ ____CO_2 + ____H_2O

2) ____ Mg + _____$O_2 \rightarrow$ ____ MgO

3) ____ F_2 + ____$SiO_2 \rightarrow$ ____ SiF_4 + ___O_2

4) ____ AgCl + ____ Fe $\rightarrow$ ____ $FeCl_3$ + ____Ag

5) ____ O_2 + ____ $F_2 \rightarrow$ ____ OF_2

6) ____ C_3H_8O + ____$O_2 \rightarrow$ ____CO_2 + ____H_2O

7) ____ NI_3 + $\rightarrow$ ____ N_2 + ____I_2

8) ____ Li + ____ $N_2 \rightarrow$ ____ Li_3N