Name Key Period ______ Date ______

Unit 2

C.1 SUPPLEMENT: KEEPING TRACK OF ATOMS

Fill-in-the-Blanks

1. A chemical equation is balanced if there are the same # of each kind of atom 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. $CaCO_3$ = 1 Ca, 1 C, 3 O
   b. $(NH_4)_2SO_4$ = 2 N, 8 H, 1 S, 4 O
   c. $3\ H_2$ = 6 H
   d. $4\ Mg(OH)_2$ = 4 Mg, 8 O, 8 H
   e. $Ba(NO_3)_2$ = 1 Ba, 2 N, 6 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
2	Na	2
4	H	4
2	O	2

Balanced? Yes X No ____

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

Reactants		Products
10	N	10
12	H	12
6	O	6

Balanced? Yes X 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. $NaCl + F_2 \longrightarrow NaF + Cl_2$

1	Na	1
1	Cl	2
2	F	1

Balanced? Yes ____ No X

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

3	Na	3
3	Br	2
3	H	2
1	P	1
4	O	4

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

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

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

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

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

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

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 X No ______

Name Key Period ______ Date ______

Unit 2

C.2 SUPPLEMENT: BALANCING EQUATIONS

Balance the following equations.

1. $\underline{2}\ H_2 + \underline{\quad}\ O_2 \rightarrow \underline{2}\ H_2O$

2. $\underline{2}\ Mg + \underline{\quad}\ O_2 \rightarrow \underline{2}\ MgO$

3. $\underline{\quad}\ Ca + \underline{2}\ H_2O \rightarrow \underline{\quad}\ Ca(OH)_2 + \underline{\quad}\ H_2$

4. $\underline{\quad}\ Cu + \underline{2}\ HgNO_3 \rightarrow \underline{\quad}\ Cu(NO_3)_2 + \underline{2}\ Hg$

* 5. $\underline{\quad}\ C_3H_8 + \underline{5}\ O_2 \rightarrow \underline{3}\ CO_2 + \underline{4}\ H_2O$

6. $\underline{2}\ Al + \underline{3}\ F_2 \rightarrow \underline{2}\ AlF_3$

7. $\underline{4}\ Fe + \underline{3}\ O_2 \rightarrow \underline{2}\ Fe_2O_3$

8. ___ Fe_3O_4 + 4 H_2 $\rightarrow$ 3 Fe + 4 H_2O

9. 4 HBr + ___ O_2 $\rightarrow$ 2 Br_2 + 2 H_2O

10. ___ Al_2O_3 + 6 HCl $\rightarrow$ 2 $AlCl_3$ + 3 H_2O

11. 3 NH_4OH + ___ $FeCl_3$ $\rightarrow$ ___ $Fe(OH)_3$ + 3 NH_4Cl

* 12. 4 NH_3 + 5 O_2 $\rightarrow$ 4 NO + 6 H_2O

2 2.5 2 3 → multiply all by 2 to get whole #s

13. ___ I_2 + 10 HNO_3 $\rightarrow$ 2 HIO_3 + 10 NO_2 + 4 H_2O

14. 3 CaO + ___ P_2O_5 $\rightarrow$ ___ $Ca_3(PO_4)_2$

15. 6 NaOH + ___ $Al_2(SO_3)_3$ $\rightarrow$ 3 Na_2SO_3 + 2 $Al(OH)_3$