Balancing Act

Name _____

Atoms are not _____ or _____ during a chemical reaction. Scientists know that there must be the_____number of atoms on each_____of the_____. To balance the chemical equation, you must add_____in front of the chemical formulas in the equation. You cannot_____or_____subscripts!

1) Determine number of atoms for each element.

2) Pick an element that is not equal on both sides of the equation.

3) Add a coefficient in front of the formula with that element and adjust your counts.

4) Continue adding coefficients to get the same number of atoms of each element on each side.

☐ Mg + ☐ O_2 --> ☐ MgO

Mg = Mg =

O = O =

Try these:

☐ Ca + ☐ O_2 --> ☐ CaO

Ca = Ca =

O = O =

☐ N_2 + ☐ H_2 --> ☐ NH_3

N = N =

H = H =

☐ Cu_2O + ☐ C--> ☐ Cu + ☐ CO_2

Cu = Cu =

O = O =

C = C =

☐ H_2O_2 --> ☐ H_2O + ☐ O_2

H = H =

O = O =

Balancing Act Practice Name _____

Balance each equation. Be sure to show your lists! Remember you cannot add subscripts or place coefficients in the middle of a chemical formula.

1. $Na + MgF_2 \rightarrow NaF + Mg$

2. $Mg + HCl \rightarrow MgCl_2 + H_2$

3. $Cl_2 + KI \rightarrow KCl + I_2$

4. $NaCl \rightarrow Na + Cl_2$

5. $Na + O_2 \rightarrow Na_2O$

6. $Na + HCl \rightarrow H_2 + NaCl$

7. $K + Cl_2 \rightarrow KCl$

Challenge: This one is tough!

$C_2H_6 + O_2 \rightarrow CO_2 + H_2O$

Step-by-Step Example Problem:

Step 1: Determine number of atoms for each element.

$Mg + O_2 \dashrightarrow MgO$

Mg = 1	Mg = 1
O = 2	O = 1

Step 2: Pick an element that is not equal on both sides of the equation.

$Mg + O_2 \dashrightarrow MgO$

Mg = 1	Mg = 1
O = 2	O = 1

Since the O atoms are not equal, we'll target those first!

Step 3: Add a coefficient in front of the formula with that element and adjust your counts.

$Mg + O_2 \dashrightarrow 2MgO$

Mg = 1	Mg = ~~1~~ 2
O = 2	O = ~~1~~ 2

Adding a 2 in front of MgO will change the number of atoms on the product side of the equation.

Step 4: Continue adding coefficients to get the same number of atoms of each element on each side.

$2Mg + O_2 \dashrightarrow 2MgO$

Mg = ~~1~~ 2	Mg = ~~1~~ 2
O = 2	O = ~~1~~ 2

Now we need to increase the number of Mg atoms we have on the reactant side. Adding a 2 in front of Mg will give us 2 atoms of Mg and balance the equation.