Chemistry
Ms. Ye

Name _____
Date _____Block_____

Go to: **http://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_en.html** and click on "introduction"

Reaction1: Make Ammonia

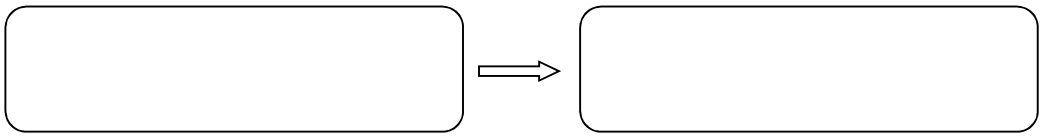
1. Click on the up arrow so that you have 1 of each reactant and product.
2. How many atoms of each element do you have on the left and right side of the arrow?

Element	Reactant (Left)	Product (Right)
N		
H		

3. Click the up and down arrows to adjust the number of molecules on both sides. Fill in the proper coefficients when you are successful (yellow smiley face).

____ N_2 + ____ H_2 → ____ NH_3

4. In the boxes, draw the particle view of the balanced equation as shown in the simulation



Reaction 3: Combust Methane

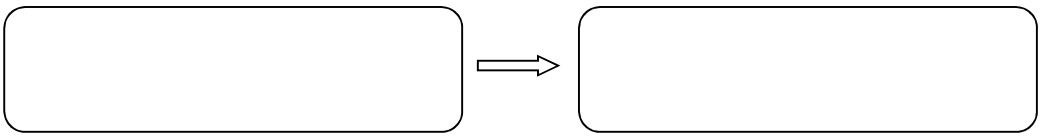
1. Click on the up arrow so that you have 1 of each reactant and product.
2. How many atoms of each element do you have on the left and right side of the arrow?

Element	Reactant	Product
C		
H		
O		

3. Click the up and down arrows to adjust the number of molecules on both sides. Fill in the proper coefficients when you are successful (yellow smiley face).

___ CH_4 + ___ O_2 → ___ CO_2 + ___ H_2O

4. In the boxes, draw the particle view of the balanced equation as shown in the simulation



Checkpoint:
Describe the process you need to go through when balancing a chemical equation.

Balancing Game:

Click on "game" at the bottom of the screen and complete levels 1 and 2. Get a stamp below from the teacher when you get a full score.

Level 1: Level 2: Level 3:

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In balanced chemical reaction equations: the **coefficients** represent the relative number of **moles** of substance that is being reacted or produced.

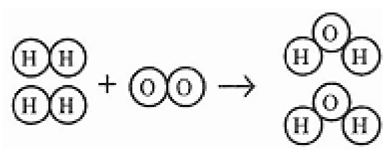
Ex: Consider the balanced equation 2 H_2 + 1 O_2 → 2 H_2O

This equation can be read as "2 moles of H_2 react with 1 mole of O_2 to make 2 moles of H_2O"

Balancing Equations Practice:

1. **2** $H_2(g)$ + **1** $O_2(g)$ → **2** $H_2O(l)$

Molecular representation:



1. Start by assuming you have ***one*** molecule for ***each*** reactant and product listed in the given equation
2. If the reaction is unbalanced, add another set of molecules for the necessary substance
3. Write in the coefficients for the balanced equation
4. Use the coefficients of the balanced equation to answer the question about the reaction
5. Identify the reaction type

1) ___NaCl + ___F_2 → ___NaF + ___Cl_2

Molecular Representation & Reaction Type:

*What is the total number of moles of NaCl that reacted when 1 mole of Cl_2 is produced? ________

2) ___$FeCl_3$ + __NaOH → ___$Fe(OH)_3$ + __NaCl

Molecular Representation & Reaction Type:

*How many moles of NaCl are produced when 1 mole of $FeCl_3$ is completely reacted? _______
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3) ___S + ___O_2 → ___SO_3

Molecular Representation & Reaction Type:

*How many moles of S are needed to completely react with 3 moles of O_2? _____

4) ___NH_4NO_2 →___H_2O + ___N_2

Molecular Representation & Reaction Type:

*How many moles of NH_4NO_2 is consumed in a reaction if 2 moles of H_2O is produced? _____

5) ___Fe_2O_3 + ___C → ___Fe + ___CO_2

Molecular Representation & Reaction Type:

*How many moles of Fe_2O_3 are completely consumed in a reaction if 4 moles of Fe is produced? _____

6) ___$ZnCl_2$ + ___$AgNO_3$ → ___$Zn(NO_3)_2$ + __AgCl

Molecular Representation & Reaction Type:

*How many moles of $AgNO_3$ are required to completely react with 1 mole of $ZnCl_2$? _____

7) ___Na_2O + ___H_2O → ___NaOH

Molecular Representation & Reaction Type:

*How many moles of NaOH is produced when 1 mole of water is reacted with excess Na_2O? _____

8) ___$Ca(ClO_3)_2$ →___$CaCl_2$ + ___O_2

Molecular Representation & Reaction Type:

*How many moles of $Ca(ClO_3)_2$ has decomposed when 3 moles of O_2 is produced? _____

HOMEWORK: Balance the following reactions AND identify the reaction type.

Balanced Reaction	Reaction Type

1) _____Cl_2 (aq) + _____KBr (aq) → _____KCl (aq) + _____Br_2 (aq)

2) _____HgO (s) → _____Hg (l) + _____O_2 (g)

3) _____$AlBr_3$ + _____K_2SO_4 → _____$Al_2(SO_4)_3$ + _____KBr

4) _____Al (s) + _____O_2 (g) → _____Al_2O_3 (s)

5) _____$FeCl_3$ + _____NaOH →_____$Fe(OH)_3$ + _____NaCl

6) _____C_3H_8 (g) + _____O_2 (g) → _____CO_2 (g) + _____H_2O (g)

7) _____NaOH (aq) + _____HCl (aq) → _____NaCl (aq) + _____H_2O (aq)

8) _____H_2O (l) + _____Fe (s) → _____Fe_2O_3 (s) + _____H_2 (g)

9) _____$AgNO_3$ (aq) + _____Cu (s) → _____$Cu(NO_3)_2$ (aq) + _____Ag (s)

10) _____KOH(aq) + _____H_2SO_4 (aq) → _____H_2O (l) + _____K_2SO_4(aq)

11) _____ $(NH_4)_2CO_3$ → _____NH_3 + _____CO_2 + _____H_2O

12) _____C_7H_{16} (l) + _____O_2 (g) → _____CO_2 (g) + _____H_2O (l)