Five Reaction Types

CλeMis+ry: http://genest.weebly.com

Stop in for help every day at lunch and Tues &Thurs after school!

ANSWER KEY

Name_____

Period_____

Predict the products for the following reactions then balance the equation.

Get the formula RIGHT

1:3:2:2 okay too!

Write out the **unbalanced** version of each reaction below	Stop! Don't touch this column until you get a stamp for the left hand column. Now rewrite the same reaction as a **balanced** reaction.
$CaCO_3 \rightarrow$? + ? (decomposition to form carbon dioxide and calcium oxide) $CaCO_3 \rightarrow CO_2 + CaO$	$CaCO_3 \rightarrow CO_2 + CaO$
$C_2H_4O_2 + O_2 \rightarrow$? + ? (combustion) $C_2H_4O_2 + O_2 \rightarrow CO_2 + H_2O$	$2C_2H_4O_2 + 6O_2 \rightarrow 4CO_2 + 4H_2O$
(single replacement) $Na + Ag_2S \rightarrow$? + ? $Na + Ag_2S \rightarrow Na_2S + Ag$	$2Na + Ag_2S \rightarrow Na_2S + 2Ag$
(combination) silver metal and oxygen gas reacting to form just a single product $Ag + O_2 \rightarrow Ag_2O$	$4Ag + O_2 \rightarrow 2Ag_2O$
(double replacement) $NaOH + Ag_2SO_4 \rightarrow$? + ? $NaOH + Ag_2SO_4 \rightarrow Na_2SO_4 + AgOH$ UNBALANCED!	$2NaOH + Ag_2SO_4 \rightarrow Na_2SO_4 + 2AgOH$
$AgNO_3 + CuCl_2 \rightarrow$? + ? $AgNO_3 + CuCl_2 \rightarrow Cu(NO_3)_2 + AgCl$	$2AgNO_3 + CuCl_2 \rightarrow Cu(NO_3)_2 + 2AgCl$
(combustion) $C_3H_6 + O_2 \rightarrow$? + ? $H_2O + CO_2$	$2C_3H_6 + 9O_2 \rightarrow 6H_2O + 6CO_2$
(combination) pure aluminum reacting with pure iodine to just a single product $Al + I_2 \rightarrow AlI_3$	$2Al + 3I_2 \rightarrow 2AlI_3$
(combustion) $O_2 + C_5H_{12}O_2 \rightarrow$? + ? $\rightarrow CO_2 + H_2O$	$O_2 + C_5H_{12}O_2 \rightarrow CO_2 + H_2O$
(single replacement) $Na + CaSO_4 \rightarrow$? + ? $Na_2SO_4 + Ca$	$2Na + CaSO_4 \rightarrow Na_2SO_4 + Ca$
(decomposition to form water and a pure element) $H_2O_2 \rightarrow$? + ? $H_2O + O_2$	$2H_2O_2 \rightarrow 2H_2O + O_2$
Get a stamp here:	

Balancing Combustion Reactions

EHS CAeMIs+rY - *Mr. Genest*

Name ANSWERS

How to turn an unbalanced equation into a balanced equation

- With your finger, point to one element before and the same element after the arrow. Whichever side has not enough, increase the coefficient (The Big Number – never never touch the small subscript numbers)
- ***write a little scoreboard. It helps. Grown up chemists do it all the time.***
- Balance chemical formulas by placing coefficients in front of them. **DO NOT** add subscripts, because this will change the formulas.

Balance these!

1. $N_{2(g)} + H_{2(g)} \rightarrow NH_{3(g)}$	draw a little scoreboard over here to keep track
$N_2 + 3H_2 \rightarrow 2NH_3$	

2. $C_3H_8 + O_2 \rightarrow {}^{3}CO_2 + {}^{4}H_2O$	draw a little scoreboard over here to keep track
$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$	

3. $KClO_3 \rightarrow KCl + O_2$	draw a little scoreboard over here to keep track
$2KClO_3 \rightarrow 2KCl + 3O_2$	

balance each by writing coefficients in front of the compounds:

4. $CuO_{(s)} + C_{(s)} \rightarrow Cu_{(s)} + CO_{2(g)}$

$2CuO + C \rightarrow 2Cu + CO_2$

5. $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

6. $4NH_{3(g)} + 5O_{2(g)} \rightarrow 4NO_{(g)} + 6H_2O_{(l)}$

ANSWER: $4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$

7. Which reaction numbers in #1 through #6 are combustion reactions? #2 AND #5

8. Write a reaction that describes the combustion of CH_3OH. Balance it.

$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$

2	C	2
8	H	8
2+6	O	4+4

9. Which equation shows conservation of mass?

(1) $H_2 + O_2 \rightarrow H_2O$

(2) $H_2 + O_2 \rightarrow 2H_2O$

(3) $2H_2 + O_2 \rightarrow 2H_2O$

(4) $2H_2 + 2O_2 \rightarrow 2H_2O$

4	H	4
2	O	2

10. If an equation is balanced properly, both sides of the equation must have the same number of

(1) atoms (2) coefficients

(3) molecules (4) all of the above

8. Aqueous lead (IV) nitrate reacts with aqueous sodium sulfate to yield a lead (IV) sulfate precipitate and soluble sodium nitrate. Write a reaction and balance it.

$Pb(NO_3)_{4(aq)} + 2Na_2SO_{4(aq)} \rightarrow Pb(SO_4)_{2(s)} + 4NaNO_{3(aq)}$

9. Aqueous sodium hydroxide reacts with carbon dioxide gas to yield soluble sodium carbonate and liquid water. Write a reaction and balance it.

$2NaOH_{(aq)} + CO_{2(g)} \rightarrow Na_2CO_{3(aq)} + H_2O_{(l)}$

This is the back page from the day the Substitute was here on Wednesday

d. Combination $Mg + N_2 \rightarrow Mg_3N_2$

e. decomposition $H_2O_2 \rightarrow H_2O + O_2$

f. Single rep. $Cd + HCl \rightarrow CdCl_2 + H_2$

g. double rep. $NiSO_4 + Li_3PO_4 \rightarrow Ni_3(PO_4)_2 + Li_2SO_4$

h. Combustion $C_8H_{18} + O_2 \rightarrow CO_2 + H_2O$

i. Combination $SO_2 + O_2 \rightarrow SO_3$

j. Combination $Fe + O_2 \rightarrow Fe_2O_3$

k. single rep $Fe + CuSO_4 \rightarrow Fe_2(SO_4)_3 + Cu$

l. combination $Li + N_2 \rightarrow Li_3N$

m. combination $Al + O_2 \rightarrow Al_2O_3$

★ → n. single repl. The reaction we did in lab last week with the nail (see your notes)

o. decomp. $Na_2CO_3 \rightarrow Na_2O + CO_2$

p. Singlereplac $Zn + H_3PO_4 \rightarrow Zn_3(PO_4)_2 + H_2$

q. Single repl $Cl_2 + LiI \rightarrow LiCl + I_2$

r. decomp. $NaOH \rightarrow Na_2O + H_2O$

s. Single rep. $Mg + 2\,HCl \rightarrow MgCl_2 + H_2$

t. double rep. $FeCl_3 + NaOH \rightarrow Fe(OH)_3 + NaCl$

u. Single rep $Na + H_2O \rightarrow NaOH + H_2$

This material will be about a third of Friday's quiz.

Friday's quiz will be 1/3 each from Monday, Tuesday, and Today.