Unit 7, Day 9, February 25, 2016

Purpose:

Determine the exact reaction that happened to the nail.

Warmup:

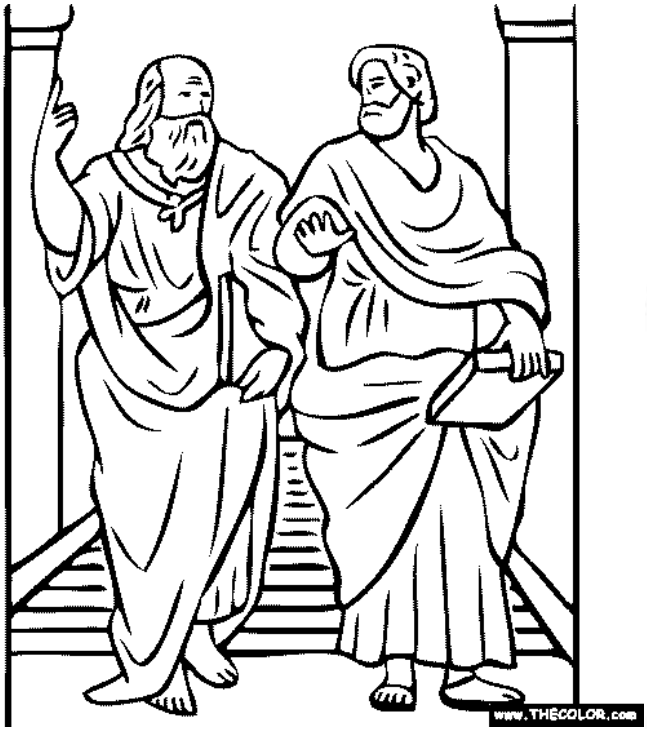
Write and balance a reaction for the combustion of C_6H_{14}

Answer to the warmup:

$2C_6H_{14} + 19O_2 \rightarrow 12CO_2 + 14H_2O$

Big helpful tip (remember!)

When you get stuck, try doubling the first substance and re-solving.



Aristotle (ancient Greece)

Gallileo (16th Century Italy)

Teacher explains briefly the difference between

theoretical and empirical with Aristotle falling objects

and

Gallileo falling objects as examples

#1 How many moles of Fe(s) reacted? How many moles of Cu(s) formed?

Your actual results from the lab blog at http:genest.weebly.com:

moles Cu	moles Fe	ratio $\frac{moles\ Cu}{moles\ Fe}$
0.035	0.037	
0.039	0.036.	
0.32	0.34	
0.15	0.170	

The average of column 3 is _____

Which ratio best describes column 3?

$\frac{3}{2}$? $\frac{1}{1}$?

Therefore, our nail reaction was probably (copy only one)

$$\underline{\mathbf{2}}Fe + \mathbf{3}CuCl_2 \rightarrow \underline{\mathbf{3}}Cu + \mathbf{2}FeCl_3$$

$$\underline{\mathbf{1}}Fe + \mathbf{1}\ CuCl_2 \rightarrow \underline{\mathbf{1}}Cu + 1\ FeCl_2$$

Conclusion: You can choose which coefficients are correct in a reaction by measuring the MOLES when you perform the reaction in the lab.

#2 Definitions:

Empirical - something we learn by doing it in real life

Theoretical – something based on prior knowledge.

Empirical and Theoretical are opposites, sort of.

Coefficients: The big numbers

Subscripts: The little numbers.

(on left page of your notebook)

#2 Check your understanding:

If we want to know which reaction happens in lab:

$PbCl_3 + 3Li \longrightarrow 1Pb + 3LiCl$

$PbCl_4 + 4Li \longrightarrow 1Pb + 4LiCl$

In the lab you find that 7 moles LEAD reacts with 21 moles of LITHIUM.

This ratio of $\frac{Li\ moles}{Pb\ moles}$ is _____

So the correct equation above is the (first/second) equation.

Balancing Reactions

Chemistry: http://gobeat.weebly.com

Stop in for help every day at lunch and then after school!

Oprah Winfrey

Name_____

Period_____

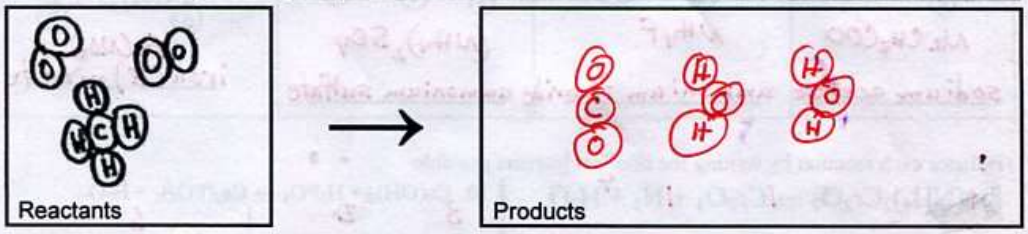
1. What are the four substances are in a combustion reaction?

fuel + oxygen → carbon dioxide + water

2. Write a balanced reaction for the combustion of C_2H_6

$2\ C_2H_6 + 7\ O_2 \rightarrow 4\ CO_2 + 6\ H_2O$

3. The box on the left shows the *reactants* of a combustion reaction. Make it a balanced reaction by drawing the products



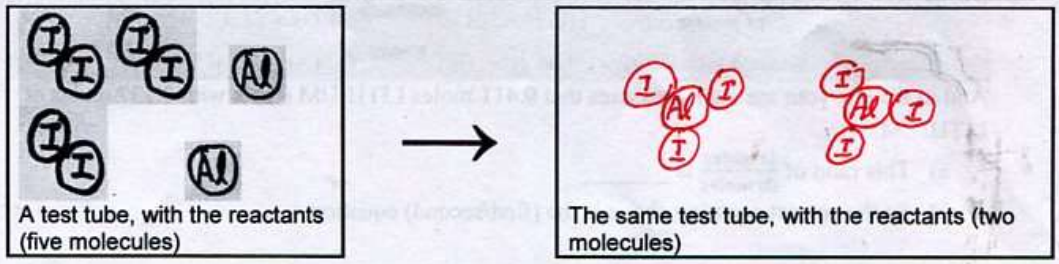
Balance each reaction by writing the smallest integers possible

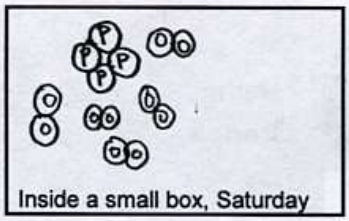
4. $1\ H_2 + 1\ Br_2 \rightarrow 2\ HBr$

5. $2\ CrBr_3 + 3\ Na_2SiO_3 \rightarrow 1\ Cr_2(SiO_3)_3 + 6\ NaBr$

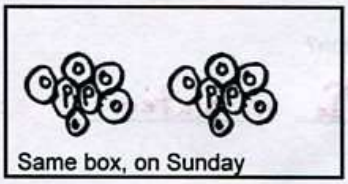
2	+	Cr	2
6	3	Br	+ 6
6	2	Na	+ 6
3	+	SiO_3	3

When placed in a test tube and ignited, iodine and aluminum give off bright light and produce a single substance.
Draw a cartoon of what would be in the test tube after the reaction finished.





Inside a small box, Saturday



Same box, on Sunday

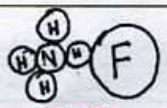
6. Write a balanced reaction that describes what occurred inside the box shown to the left.

$P_4 + 5O_2 \longrightarrow 2P_2O_5$

7. Name each substance. Remember to use the back of your periodic table.

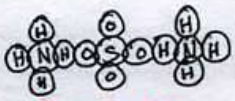
$NaCH_3COO$

sodium acetate



NH_4F

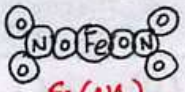
ammonium fluoride



$(NH_4)_2SO_4$

ammonium sulfate

This one needs a Roman numeral in its name!



$Fe(NO_3)_2$

iron (II) nitrate

Balance each reaction by writing the smallest integers possible

8. $1(NH_4)_2Cr_2O_7 \rightarrow 1Cr_2O_3 + 1N_2 + 4H_2O$

2	N	2
8	H	8
2	Cr	2
7	O	7

9. $2KOH + Cl_2 \rightarrow KCl + KClO + H_2O$

10. $3Ca(OH)_2 + 2H_3PO_4 \rightarrow 1Ca_3(PO_4)_2 + 6H_2O$

11. $2Cu(NO_3)_2 \rightarrow 2CuO + 4NO_2 + O_2$

We skipped #12 because it is on tomorrow's homework instead.