1. most important thing today: be able to solve this Team Lift sheet

Before you start, copy from your last Friday notes:

a) THEORETICAL (defn) the amount you Calculate. It's not real; it's the amount you would get in a perfect world.

b) ACTUAL (defn) The amount you get in the real world, not from a calculator.

c) PERCENT YIELD (FORMULA)

$$\frac{\text{ACTUAL}}{\text{THEORETICAL}} \times 100 = \%\text{ yield}$$

Worth 5 points Class Credit.
No credit if not worked with your partner.

Name (solve the odds)

_____

Name (solve the evens)

_____

2.
Sign your name if you are doing this problem: _____
How many moles of mailboxes are taped to this tabletop?

$$\frac{7 \text{ boxes}}{1} \times \left(\frac{1 \text{ mole}}{6.02\times10^{23} \text{ boxes}}\right) = 1.16\times10^{-23} \text{ moles}$$

3.
Sign your name if you are doing this problem:

_____

How many moles of Carrie Brownstein faces are on the table?

$$\frac{14 \text{ faces}}{1} \times \left(\frac{1 \text{ mole}}{6.02\times10^{23} \text{ faces}}\right) = 2.33\times10^{-23} \text{ moles}$$

Get a stamp here when you show the teacher BOTH partners' finished sheets

4. Sign your name if you are doing this problem:

_____

What is the mass of one mole of dinitrogen tetrafluoride?
(be careful, it's toxicity is unknown)

N: $2\times(14) = 28$ grams
F: $4\times(19) = 76$ grams
104 grams

5. Sign your name
if you are doing this problem: _____

Hydrogen sulfide gas, which smells like rotten eggs, burns in air to produce sulfur dioxide and water. How many moles of oxygen gas would be needed to completely burn 73 moles of hydrogen sulfide?

Equation: $2\ H_2S_{(g)} + 3\ O_{2\,(g)} \rightarrow 2\ SO_{2(g)} + 2\ H_2O_{(g)}$

	H_2S	O_2	SO_2	H_2O
before	73 mol			
change	-73 mol	→		
afer	zero			

$$\frac{73\ mol\ H_2S}{1} \times \left(\frac{3\ mol\ O_2}{2\ mol\ H_2S}\right) = 109.5\ mol\ O_2$$

6. Sign your name
if you are doing this problem: _____

Propane, C_3H_8, burns in air to form carbon dioxide and water. If 12 moles of carbon dioxide are formed, how many moles of propane were burned?

a. BALANCED Equation:

$1\ C_3H_8 + 5\ O_2 \rightarrow 3\ CO_2 + 4\ H_2O$

	C_3H_8	O_2	CO_2	H_2O
before	?		zero	
change			+12	
afer	?		12 mol	

$$\frac{12\ mol\ CO_2}{1} \times \left(\frac{1\ mol\ C_3H_8}{3\ mol\ CO_2}\right) = 4\ mol\ C_3H_8$$

2. Also important: Hints for solving tonight's homework:

Grams, moles.

CAeMis+ry: http://genest.weebly.com

Test 3 is a week from this Friday! Shockingly soon!

Name_____

Period_____

1. Write the name of a woman that you would like to see in one of our worksheets this month for women's history month. _____

2. Assume that one mole of carbon atoms has a mass of 12.01 g.
   What would be the mass of 55.55 moles of carbon atoms?

$$\frac{\text{grams}}{\text{moles}} = \frac{1}{}$$

3. How many carbon atoms are there in 0.00000004440 moles of carbon atoms?

$$\frac{\text{atoms}}{\text{moles}} = \frac{1}{}$$

4. Use your periodic table to find the molecular weight of C_2H_6.

5. Use your periodic table to find the molecular weight of $CaCO_3$

6. Find the number of grams of O_2 which are needed to produce 20.0 g of P_2O_5 at STP, according to this balanced equation:

$$1\,P_{4(s)} + 5\,O_{2(g)} \longrightarrow 2\,P_2O_{5(s)}$$

$$\frac{20.0\text{ g } P_2O_5}{\frac{142\text{ g } P_2O_5}{1\text{ mol } P_2O_5}} \cdot \frac{\text{mol } O_2}{\frac{5\text{ mol } O_2}{2\text{ mol } P_2O_5}} \cdot \frac{\text{grams } O_2}{\frac{32\text{ grams } O_2}{1\text{ mol } O_2}} = \text{grams } O_2$$

7. For the same reaction described in the previous problem, find the number of grams of O_2 which are needed to produce 9.34×10^{-4} g of P_2O_5 at STP

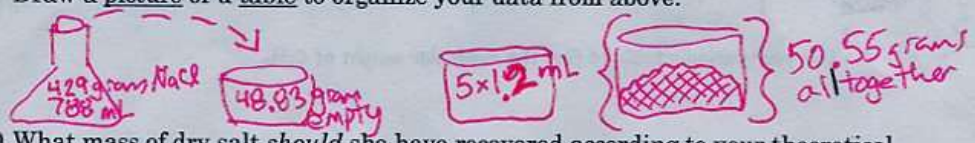
$$\frac{9.34 \times 10^{-4}\text{ grams } P_2O_5}{1} \cdot \frac{1\text{ mol } P_2O_5}{142\text{ grams } P_2O_5} \cdot \frac{5\text{ mol } O_2}{2\text{ mol } P_2O_5} \cdot \frac{32\text{ grams } O_2}{1\text{ mol } O_2} = \text{grams } O_2$$

8. For the same reaction described in the previous problem, find the number of grams of P_4 which are needed to react with 5.35×10^5 g of O_2 at STP

Part 2: Deciding what effect an error has

Dr. Roosevelt mixed up some brine by stirring 429 grams of sodium chloride into enough water to make 788 mL of solution. She then took a clean 48.83 gram crucible filled and filled it by completely emptying a pipette 5 times into the crucible (a pipette that holds 1.2 mL). Heating this until all of the water evaporated resulted in a dry crust of salt in her crucible. Her cooled crucible, with salt, weighed 50.55 grams.

9. Draw a picture or a table to organize your data from above.



10. What mass of dry salt *should* she have recovered according to your theoretical calculations? (Set up your calculation in a single line if possible, like we did in class--it will make the next part *much* easier to solve.)

$$\frac{5 \text{ squirts}}{1} \times \frac{\text{mL}}{\text{squirt}} \times \frac{\text{gram}}{\text{mL}} = \text{grams NaCl}$$

11. Based on her scale readings, how many grams of salt did she actually recover?

12. What was her theoretical? (Friday's notes—or website for March 10)

13. What was her actual?

14. What was her % yield?

3. And here are the answers to the Joy sheet

Mole to mole Stoichiometry

CλeMis+ry: http://genest.weebly.com

Joy Buolamwini

Name_____

Period_____

read these instructions!

STEP a. Write the balanced chemical equation.

STEP b. show a *before – change – after* table

STEPc. Do the math by

- Identifying what is given (with units) and what you want to find (with units) and

Using coefficients from balanced equation to determine mole ratio.

EXAMPLE TO DO TOGETHER AND TAKE COPIOUS NOTES AROUND:

Iron metal and oxygen combine to form the magnetic oxide of iron, Fe_3O_4.

How many moles of iron can be converted to magnetite by 8.80 moles of pure oxygen?

$3Fe + 2O_2 \rightarrow Fe_3O_4$

	Fe	O_2	Fe_3O_4
before	?	8.80 moles	?
change	13.2	−8.80	
after		ZERO	

← MUST BE MOLES

TO GO SIDEWAYS, DO A CONVERSION

$$8.80 \text{ moles } O_2 \times \left(\frac{3 \text{ moles Fe}}{2 \text{ moles } O_2} \right) = 13.2 \text{ moles}$$

USE Balanced EQUATION COEFFICIENTS TO CONNECT mole to mole

READ these hints:

The ONLY line where you can jump sideways on the BCA table is the CHANGE To do this, you must do a moles-to-moles conversion.

The only way to go from BEFORE to CHANGE use a grams to mole conversion from the periodic table.

ydrogen sulfide gas, which smells like rotten eggs, burns in air to produce sulfur dioxide and water. How many moles of oxygen gas would be needed to completely burn 8 moles of hydrogen sulfide?

a. Equation: $2\ H_2S_{(g)} + 3\ O_{2\,(g)} \rightarrow 2\ SO_{2(g)} + 2\ H_2O_{(g)}$

b.

	H_2S	O_2	SO_2	H_2O
Before	8 mol	??	—	—
Change	−8 mol	—	—	—
After	Zero	—	—	—

c. $-8\ \text{mol}\ H_2S \times \frac{3\ \text{mol}\ O_2}{2\ \text{mol}\ H_2S} = 12\ \text{moles}\ O_2$

2. Propane, C_3H_8, burns in air to form carbon dioxide and water. If 12 moles of carbon dioxide are formed, how many moles of propane were burned?

a. Equation: $C_3H_8 + O_2 \rightarrow 3CO_2 + H_2O$

b.

Before	—	—	0	—
Change	—	—	+12	—
After	—	—	12 moles	—

c. $12 \text{ moles } CO_2 \times \left(\frac{1 \text{ mole } C_3H_8}{3 \text{ moles } CO_2} \right) = 4 \text{ moles } C_3H_8$

3. Ammonia, NH_3, for fertilizer is made by causing hydrogen and nitrogen to react at high temperature and pressure. How many moles of ammonia can be made from 0.15 moles of nitrogen gas?

a. Equation: $3H_2 + 1N_2 \rightarrow 2NH_3$

b.

Before	—	—	.15 moles	—
Change	—	—	-.15 moles	—
After	—	—	zero	—

$.15 \text{ moles } N_2 \times \left(\frac{2 \text{ moles } NH_3}{1 \text{ mole } N_2} \right) = .30 \text{ moles } NH_3$