Today's notes were

just to follow along as we solved an example on the front of the Joy sheet, see below:

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, Fe3O4.

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

$$3Fe + 2O_2 \rightarrow Fe_3O_4$$

	$3Fe$	$2O_2 \rightarrow$	Fe_3O_4
before	?	8.80 moles	?
change	13.2	-8.80	
after		ZERO	

← MUST BE MOLES

TO GO SIDEWAYS, DO A CONVERSION

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

USE Balanced EQUATION COEFFICIENT TO Convert 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.

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1. 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 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.
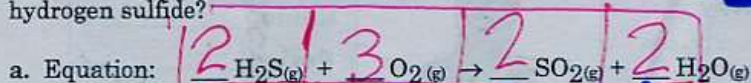
	Before			
Before	8 mol	??		
Change	-8 mol	—		
After	zero	—		

   c. $-8\ mol\ H_2S \times \left(\dfrac{3\ \frac{mol}{O_2}}{2\ \frac{mol}{H_2S}}\right) = 12\ moles\ O_2$

2. Propane, C3H8, 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:

   b.

Before	—	—	—	—
Change	—	—	—	—
After	—	—	—	—

   c.

3. Ammonia, NH3, 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:

   b.

Before	—	—	—	—
Change	—	—	—	—
After	—	—	—	—

theoretical yield

CʌeMis+ry:

http://genest.weebly.com

come 3x for help

Jane Goodall & friend

Name **KEY**

Period _____

Part 1: Solving a concentration problem in a single line.

It will often be helpful to set up our story problems using a single line calculation.

1. A solution was mixed up that contained 344 grams of sodium chloride (table salt) per 1700 mL of aqueous solution. If a chemist took 6 squirts of this substance using a pipette that holds 1.3 mL and then she evaporated it in a crucible, how many grams of salt should she expect to obtain?

$$\frac{6 \text{ SQUIRTS}}{1} \left| \frac{1.3 \text{ mL}}{1 \text{ squirt}} \right| \frac{344 \text{ grm}}{1700 \text{ mL}} = \frac{1.58 \text{ grams}}{1.6 \text{ grams}}$$

(INF) (TWO) (TWO)

2. A solution was mixed up that contained 40.6 grams of sodium chloride (table salt) per 568 mL of aqueous solution. If a chemist took 5 squirts of this substance using a pipette that holds 2.1 mL and then she evaporated it in a crucible, how many grams of salt should she expect to obtain?

$$\frac{5 \text{ SQUIRTS}}{1} \left| \frac{2.1 \text{ mL}}{1 \text{ SQUIRT}} \right| \frac{40.6 \text{ gram}}{568 \text{ mL}} = 0.75 \text{ grams}$$

A solution was mixed up that contained 149 grams of sodium chloride (table salt) per 1700 mL of aqueous solution.

3. If a chemist took 4 squirts of the above substance using a pipette that holds 1.6 mL and then she evaporated it in a crucible, how many grams of salt should she expect to obtain?

$$\frac{4 \text{ SQUIRTS}}{1} \Bigg| \frac{1.6 \text{ mL}}{1 \text{ SQUIRT}} \Bigg| \frac{149 \text{ gram}}{1700 \text{ mL}} = 0.56 \text{ gram}$$

B. If she actually obtains 0.40 grams, did she obtain too little or too much?

Too Little!

C. Tell one SPECIFIC thing (not 'human error') that could cause her result to be like this.

Spilled, forgot to zero, elevation, humidity, heated too fast salt popped out

4. A. If a chemist took 3 squirts of the above substance using a pipette that holds 2.1 mL and then he evaporated it in a crucible, how many grams of salt should he expect to obtain?

$$\frac{3 \text{ squirt}}{1} \Bigg| \frac{2.1 \text{ mL}}{1 \text{ squirt}} \Bigg| \frac{149 \text{ gram}}{1700 \text{ mL}} = 0.55 \text{ grams}$$

B. If he actually obtains 0.60 grams, did he obtain too little or too much?

Too much.

C. Tell one SPECIFIC thing (not 'human error') that could cause her result to be like this.