## 6.6 Moles Day 1

<u>SPARK</u>

Try balancing the following equations:

$$\_\_\_\_ H_2 + \_\_\_\_ I_2 \rightarrow \_\_\_\_\_ HI$$

$$\_\_\_\_\_ N_2 + \_\_\_\_\_ H_2 \rightarrow \_\_\_\_\_ NH_3$$

$$\_\_\_\_\_ Rb + \_\_\_\_\_ S_8 \rightarrow \_\_\_\_\_ Rb_2S$$
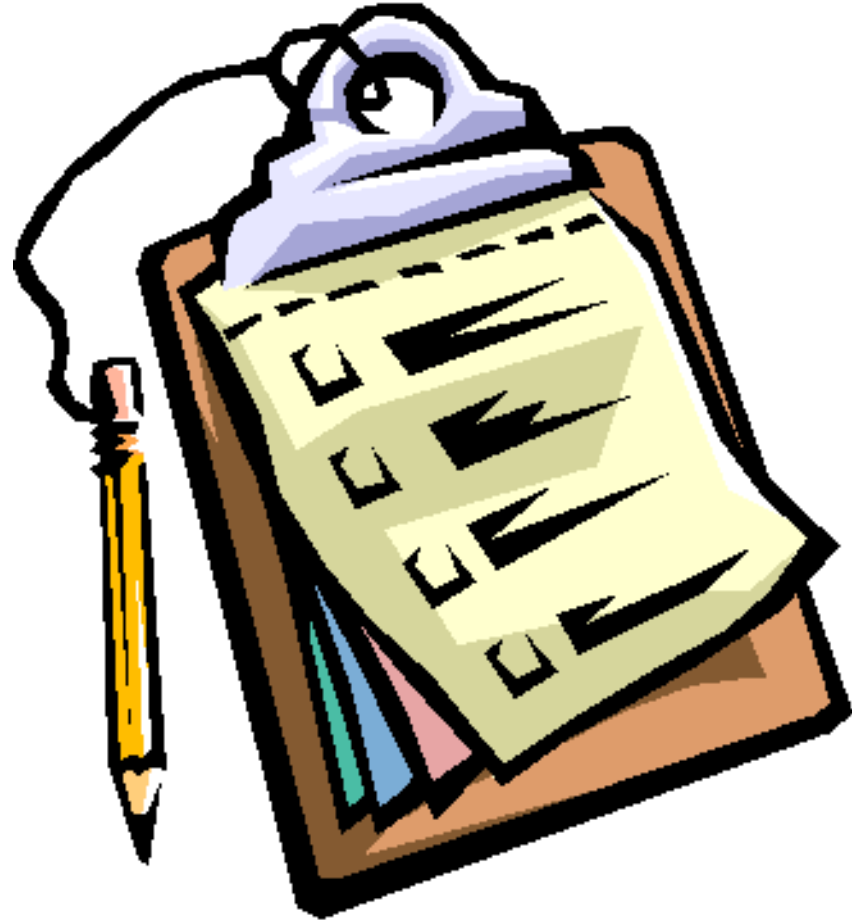
# Objective

SWBAT explain what a mole is and convert between moles of reactants and moles of products using the mole ratio.

# SPECIAL ANNOUNCEMENT

- FIELD TRIP!
- Six Flag is happening: May 9th!
- Permission slips AND money due NEXT WEEK!

# Agenda:

- SPARK/Objective
- Mole Walk
- Recap
- Practice
- Homework

Objective: SWBAT explain what a mole is and convert between grams and moles

# Mole Walk

- Walk around the room to the different stations and write down the substance, formula, mass and at least two observations!

- Try to figure out what is similar about all of these stations (think about topics of Unit 6!)

Objective: SWBAT explain what a mole is and convert between grams and moles

# Actual Commality

- There is ONE mole of each of these substances on display!

# THE MOLE

- A *mole* is a counting unit.

Just like:

>12 eggs equals a *dozen* eggs

>144 pencils equals one *gross* of pencils

>60 seconds equals one *minute*

>500 sheets of paper equals one *ream*

Objective: SWBAT explain what a mole is and convert between grams and moles

# Avogadro's Number

- One mole equals $6.022 \times 10^{23}$ particles/atoms.

- This is known as Avogadro's number.

- We can use this to calculate the total amount of atoms of a given substance

Objective: SWBAT explain what a mole is and convert between grams and moles
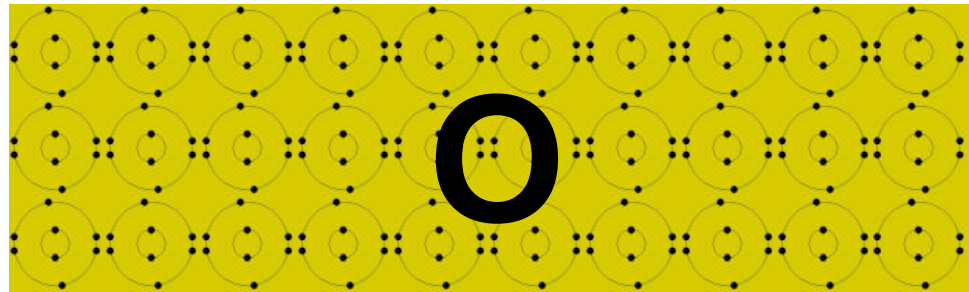
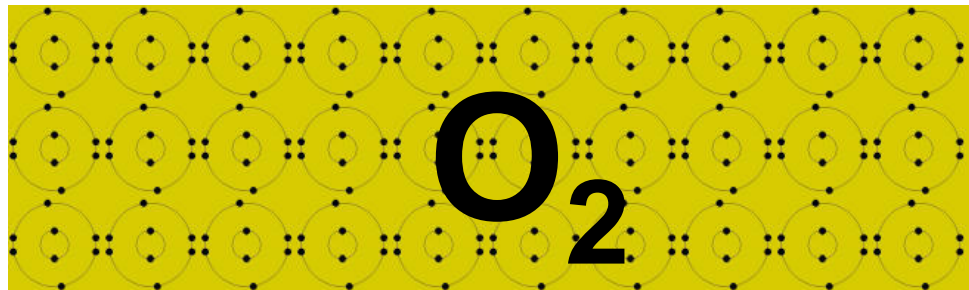# So one mole of...

...doughnuts is 6.02 x $10^{23}$ doughnuts



... Ostriches is 6.02 x $10^{23}$ ostriches



...oxygen atoms is 6.02 x $10^{23}$ atoms of oxygen



**O**

...oxygen molecules is 6.02 x $10^{23}$ molecules of oxygen



**O$_2$**

# Key Ideas

- A mole is equal to NUMBER particles/things/ grams/atoms/ etc.

- We use THE MOLE to describe the number of atoms in an element or compound because it is a faster way of explaining how much stuff we are dealing with.

- The COEFFICIENT in front of the element or compound tells us how many MOLES we have.

Objective: SWBAT explain what a mole is and convert between grams and moles

# Example:

$$2\ Al + 3\ CuSO_4 \rightarrow Al_2(SO_4)_3 + 3\ Cu$$

How many moles of Al do we have?

What is the mole to mole ratio of Al to CuSO-4?

Objective: SWBAT explain what a mole is and convert between grams and moles

# Let's Practice

- Complete the first page of your notes sheet
- Do not fill out the "*What kind of reaction is this?*" section… we will be learning this next week!

Objective: SWBAT explain what a mole is and convert between grams and moles

# Notes

- Stoichiometry is simply converting one value from one UNIT to another.
  - Example: Converting gram to moles or moles of one compound to another.
- We can figure out the number of moles of compound produced as long as we know the mole-to-mole ratio

Objective: SWBAT explain what a mole is and convert between grams and moles

# Let's See It

# Notes

Atomic MASS is represented in the units GRAMS per mole (g/mol)

1. What is the atomic mass of oxygen? (Hint: Look on your periodic table)

2. What unit is the atomic mass of oxygen in?

3. How many grams does 1 mole of oxygen weigh?

4. How many grams does 1 mole of phosphorous weigh?

5. What is the gram formula mass of $H_2O$?

Objective: SWBAT explain what a mole is and convert between grams and moles

# Check it Out!

Objective: SWBAT explain what a mole is and convert between grams and moles

# HOMEWORK

Complete 6.6 Homework!

Read pages 80-85

Objective: SWBAT explain what a mole is and convert between grams and moles