

## **WORKING WITH MOLES LAB**

In chemistry, the fundamental unit of matter is the mole. You must understand and be able to use the mole concept. In this activity, you will practice determining the number of moles, number of grams, number of atoms, and number of molecules of different substances. Make sure that you show your work! (There is room to the right side of each table for you to show your work.)

### STATION #1: AVERAGE MASS OF PLASTIC BAGS

Determine and record the mass of three different plastic bags with labels. Calculate the average mass of one plastic bag.

*Bag #1	_____	grams
*Bag #2	_____	grams
*Bag #3	_____	grams
Average	_____	grams

### STATION #2: COPPER

Determine and record the mass of the plastic bag with the copper. What is the mass of the copper in the bag?

~ Calculate the number of moles of copper in the bag.

~ Calculate the number of atoms of copper in the bag.

* Mass of bag with copper	_____	grams
Mass of copper	_____	grams
Moles of copper	_____	moles
Atoms of copper	_____	atoms

### STATION #3: BAKING SODA (SODIUM BICARBONATE – $\text{NaHCO}_3$ )

Determine and record the mass of the plastic bag with baking soda. What is the mass of the baking soda in the bag?

~ Calculate the number of moles of baking soda in the bag.

~ Calculate the number of molecules of baking soda in the bag.

*Mass of bag with baking soda	_____	grams
Mass of baking soda	_____	grams
Moles of baking soda	_____	moles
Molecules of baking soda	_____	molecules

### STATION #4: WATER

Fill a clean, unused paper cup about two-thirds full of water. Determine and record the mass of the paper cup and water. Take a drink of the water. Determine and record the mass of the cup and the water left in it. Throw the used cup in the trash.

~ How many moles of water did you drink?

~ How many molecules of water did you drink?

* Mass of cup & water before drinking	_____	grams
* Mass of cup & water after drinking	_____	grams
Mass of water	_____	grams
Moles of water	_____	moles
Molecules of water	_____	molecules

STATION #5: CALCIUM SULFATE ( $\text{CaSO}_4$ )

Determine and record the mass of the plastic bag with calcium sulfate.

~ How many moles of calcium sulfate are in the bag?

~ How many moles of oxygen are contained in the calcium sulfate in the bag?

* Mass of bag and calcium sulfate	_____	grams
Mass of calcium sulfate	_____	grams
Moles of calcium sulfate	_____	moles
Moles of oxygen	_____	moles

STATION #6: TABLE SALT (SODIUM CHLORIDE –  $\text{NaCl}$ )

Record the number of moles of sodium chloride given on the label of the plastic bag with the salt.

Determine and record the mass of the plastic bag with salt in it.

~ How many moles of salt are in the bag?

~ What is your percent error? (Assume that the number given on the bag is the "accepted value".)

* Accepted # of moles of $\text{NaCl}$ in bag	_____	moles
* Mass of bag and salt	_____	grams
Mass of salt	_____	grams
Moles of salt	_____	moles
Percent error	_____	%

STATION #7: IRON

Record the number of atoms of iron given on the label of the plastic bag with the iron.

Determine and record the mass of the plastic bag with iron in it.

~ How many moles of iron are in the bag?

~ How many atoms of iron are in the bag?

~ What is your percent error? (Assume that the number given on the bag is the "accepted value".)

* Accepted # of atoms of $\text{Fe}$ in bag	_____	atoms
* Mass of bag and iron	_____	grams
Mass of iron	_____	grams
Moles of iron	_____	moles
Atoms of iron	_____	atoms
Percent error	_____	%

## **MOLE CONVERSION ASSIGNMENT (Standard level)**

DON'T FORGET...

~ SHOW YOUR WORK

~ ROUND YOUR ANSWERS FOR SIGNIFICANT FIGURES

~ INCLUDE UNITS WITH YOUR ANSWERS

- 1.)  $3.327 \times 10^{24}$  molecules  $\text{OBr}_2 = ?$  moles
- 2.) 375 grams  $\text{Mg}(\text{NO}_3)_2 = ?$  moles
- 3.)  $3.49 \times 10^{23}$  molecules  $\text{H}_2\text{O} = ?$  grams
- 4.) 8.42 moles  $\text{CF}_4 = ?$  molecules
- 5.) 1.375 moles  $\text{NaBr} = ?$  grams
- 6.) 4.02 grams  $\text{SeS}_2 = ?$  molecules

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