Dougherty Valley HS Chemistry
National Mole Day Celebration

Worksheet #7

Name: **Period:** **Seat#:**

Introduction: The date, October 23rd, had been designated as National Mole Day, starting at 6:02 AM. In celebration of this special date, you will be given an opportunity to make atomic cookies in class, but first…

Part I

1) Look up the definition of a mole. The chemistry "mole" not the weird little animal!

2) A mole is sometimes referred to as Avogadro's # when we are writing it as a conversion factor with mole and molecules as our units on the conversion factor. Write Avogadro's # as a conversion factor just like we do for something like inches and feet $\frac{12\ in}{1\ ft}$

3) Using Avogadro's number as a conversion factor, figure out how many molecules are in 3.58 moles of a substance. Show work in the "line method" dimensional analysis set up. Show units, cancel units, get an answer with units and a box!

4) Using Avogadro's number as a conversion factor, figure out how many moles are in 5.45×10^{25} molecules. Show work in the "line method" dimensional analysis set up. Show units, cancel units, get an answer with units and a box!

5) We can figure out how much one mole of something weighs by using the periodic table and atomic masses to calculate the "molar mass." The mass of one atom of Carbon is 12.01 amu but the mass of one mole of Carbon conveniently works out to be 12.01 grams! So the molar mass of carbon is said to be $\frac{12.01\ grams}{1\ mole}$ – which is another conversion factor we can use! Using the molar mass of Bromine, calculate how much 6.79 moles of Bromine would weigh. Show work in the "line method" dimensional analysis set up. Show units, cancel units, get an answer with units and a box!

6) Using the molar mass of the element with the electron configuration $1s^2 2s^2 2p^6 3s^1$ calculate how many moles are in 15 grams of that element. Show work in the "line method" dimensional analysis set up. Show units, cancel units, get an answer with units and a box!

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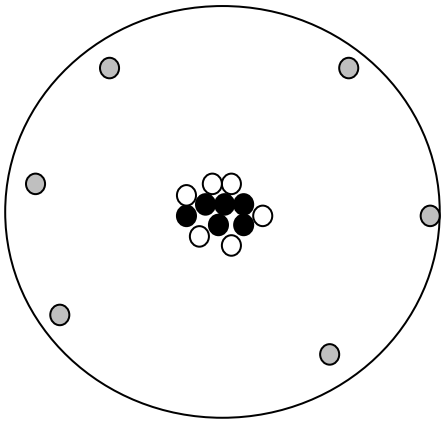
Demonstrate your knowledge of atomic structure by identifying the ion and atom below. Use the key to find the numbers of subatomic particles in each and fill in the spaces. Check this with your teacher before you proceed.

Identify these particles using this key

Proton = ● **Neutron** = ○ **Electron** = ○

p^+ = _____
n^0 = _____
e- = _____

Mass # =
Atomic # =



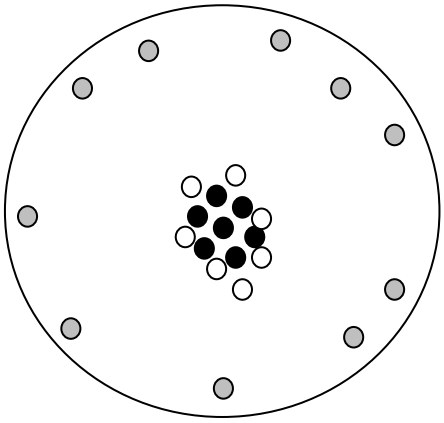
Atom or Ion?

Name of Element:

Charge =

p^+ = _____
n^0 = _____
e- = _____

Mass # =
Atomic # =



Atom or Ion?

Name of Element:

Charge:

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Part II

Create your own examples using the materials supplied by your classmates. Do one atom and one ion. Your examples must be for elements below atomic #7. Refer to the list below to determine the correct charge on ions. When directed, check your model with a key before making our "Atomic Cookies." Enjoy!

Ion List

H^{+}, Li^{+}, Be^{2+}, B^{3+}, N^{-3}, O^{-2}, F^{-1}

Atom

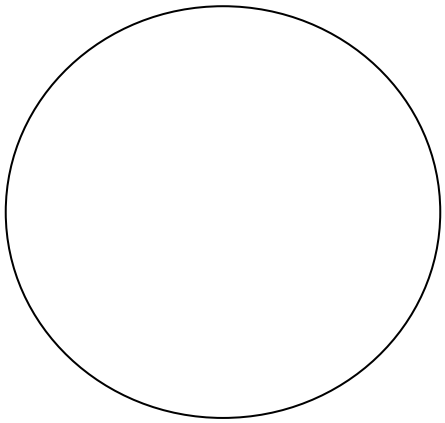
p^{+} = _____

n^{0} = _____

e- = _____

Mass # =

Atomic # =



Name of Element:

Charge:

Ion

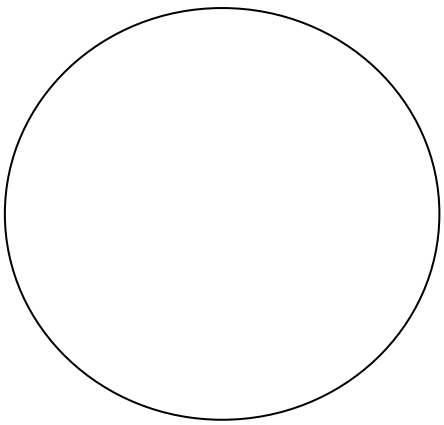
p^{+} = _____

n^{0} = _____

e- = _____

Mass # =

Atomic # =



Name of Element:

Charge: