Do all your work on binder paper, staple this paper to the front
and turn it in before you leave even if you did not finish!

Mole Conversions Worksheet #1

Directions: Perform each conversion. Show all work, show crossing units out, make sure answer has units.
Answers are in parenthesis so you can check your work as you go!!!

1) Mole → Mass
  Using molar mass of each substance, convert the following quantities.

a. 10.0 mol Cr	(520 g)	f. 0.160 mol H_2O	(2.88 g)
b. 3.32 mol K	(130 g)	g. 5.08 mol $Ca(NO_3)_2$	(834 g)
c. 2.20 x 10^{-3} mol Sn	(0.261 g)	h. 15.0 mol H_2SO_4	(1470 g)
d. 0.720 mol Be	(6.48 g)	i. 4.52 x 10^{-5} mol C_2H_4	(1.27 x 10^{-3} g)
e. 2.40 mol N_2	(67.2 g)	j. 0.0112 mol K_2CO_3	(1.55 g)

2) Mass → Mole
  Using molar mass of each substance convert the following quantities.

a. 72.0 g Ar	(1.80 mol)	f. 27.4 g NO_2	(0.596 mol)
b. 3.70 x 10^{-1} g B	(3.43 x 10^{-2} mol)	g. 5.00 g H_2	(2.50 mol)
c. 187 g Al	(6.93 mol)	h. 2.64 x 10^{-4} g Li_3PO_4	(2.28 x 10^{-6} mol)
d. 333 g SnF_2	(2.13 mol)	i. 11.0 g CH_4	(0.688 mol)
e. 7.21 x 10^{-2} g He	(1.80 x 10^{-2} mol)	j. 847 g $(NH_4)_2CO_3$	(8.82 mol)

3) What is the volume of the following gases?
  *Using molar volume, convert the following quantities. MOLAR VOLUME says that at "standard" temperature and
  pressure, one mole of any gas will take up 22.4 L of space. It is a conversion factor!*
    a. 5.40 mol O_2 (121 L)
    b. 3.20 x 10^{-2} mol CO_2 (0.717 L)
    c. 0.960 mol SO_3 (21.5 L)

4) How many moles are in each of the following volumes?
  Using molar volume, convert the following quantities.
    a. 89.6 L Ne   (4.00 mol)
    b. 1.00 x 10^3 L C_2H_6 (44.6 mol)
    c. 5.42 x 10^{-1} F_2 (2.42 x 10^{-2} mol)

5) Find the number of moles in each of the number of the following.
  Using Avogadro's Number, convert the following quantities.
    a. 1.20 x 10^{25} atoms of P   (19.9 mol)
    b. 3.87 x 10^{21} molecules of AlF_3 (6.43 x 10^{-3} mol)
    c. 4.81 x 10^{14} molecules of NH_3 (7.99 x 10^{-10} mol)

6) How many molecules are in each of the following mole quantities?
  Using Avogadro's Number, convert the following quantities.
    a. 1.24 mol Cl_2 (7.46 x 10^{23} molecules)
    b. 4.20 x 10^{-3} mol K_2S (2.53 x 10^{21} molecules)
    c. 34.02 mol $Ca(OH)_2$ (2.048 x 10^{25} molecules)

7) Convert the following two-step quantities, converting first to moles and then to the desired quantity
  Do each problem in ONE dimensional analysis set up!
    a. Find the number of molecules in 60.0 g of N_2O.   (8.21 x 10^{23} molecules)
    b. Find the volume of 3.24 x 10^{22} molecules of Ne   (1.21 L)
    c. Find the mass of 18.0 L of CH_4 (12.9 g)
    d. Find the volume of 835 g of SO_3 (234 L)
    e. Find the mass of one atom of nickel.   (1 x 10^{-22} g)