Find the mass in grams of each of the following:

0.720 mol of carbon monoxide: $mm\ CO = 12+16$	$.720\,mol \mid \frac{28\,g}{1\,mol} = 20.2\,g\ CO$
1.12 mol of potassium carbonate $K_2(CO_3) = 138.2$	$1.12\,mol \mid \frac{138.2\,g}{1\,mol} = 155\,g\ K_2CO_3$
2.06 mol of sodium hydroxide $NaOH = 40$	$2.06\,mol \mid \frac{40\,g}{1\,mol} = 82.4\,g$
* 1.56 mol of nitrogen gas* $N_2 = 28$	$1.56\,mol \mid \frac{28g}{1\,mol} = 43.7\,g$

Find the # of moles in each of the following:

11.0 grams of Ethane $C_2H_6 = 28\,g/mol$ (30)	$11.0\,g \mid \frac{1\,mol}{30\,g} = .367\,mol\ C_2H_6$
15.4 grams of carbon tetrachloride $CCl_4 = 154\,g/mol$	$15.4\,g \mid \frac{1\,mol}{154\,g} = 0.100\,mol\ CCl_4$
333 grams of Tin II Fluoride $SnF_2 = 156.7$	$333\,g \mid \frac{1\,mol}{156.7\,g} = 2.13\,mol\ SnF_2$
* 67.8 grams of chlorine gas* $Cl_2 = 71$	$67.8\,g \mid \frac{1\,mol}{71\,g} = .955\,mol\ Cl_2$

Page 300 (page 157 old book)

303 → mole map

What are the conditions (temperature and pressure) at STP? 1 atm 0°C

What is Molar Volume (liters/mole) at STP? 22.4 L/mol of a gas!

What volume would 3.20×10^{26} ~~moles~~ molecules of CO occupy at STP?	$3.20\times10^{26}\,mol \mid \frac{22.4\,L}{1\,mol} = 7.17\times10^{27}\,L$ (14900L)
What volume would 0.960 moles of CH_4 occupy at STP?	$0.960\,mol \mid \frac{22.4\,L}{1\,mol} = 21.5\,L$
What volume would 3.70 moles of *Nitrogen gas occupy at STP?	$3.70\,mol\ N_2 \mid \frac{22.4\,L}{1\,mol} = 82.9\,L$

Scrapped

$3.20\,mol\ 10^{26} \mid \frac{1\,mol}{6.02\times10^{23}\ molecules} \mid \frac{22.4\,L}{1\,mol}$

How many moles of sulfur trioxide are present if the volume is 33.6 L at STP?

$33.6\,L\ SO_3 \mid \frac{1\,mol}{22.4\,L} = 1.50\,mol\ SO_3$

% Comp → 307

Example C_3H_8 C → 81.8% H → 18%

Name _____

Copy table 10.1 on page 290 (Table 6.1 Old Book page 145)

Substance	Rep part.	Formula	Rep part in 1.00 mol
	Atom	N	6.02×10^{23}
	Molecule	N_2	
	Molecule	H_2O	
	Ion	Ca^{2+}	
	Formula Unit	CaF_2	
	Molecule	$C_{12}H_{22}O_4$	

How many moles are in 2.80×10^{25} atoms of silicon?

46.5 moles

How many atoms are in 0.360 mol of Silver?

2.17×10^{23} atoms

How many molecules are in 2.14 moles of Carbon Monoxide?

1.29×10^{24} molecules CO

How many ~~molecules~~ moles are contained in 4.65×10^{24} molecules of Nitrogen Dioxide?

7.72 moles NO_2

How many oxygen atoms are in a representative particle of each of the following?

name	formula	# of oxygen atoms
Ammonium Nitrate	NH_4NO_3	3
Lead II Sulfate	$PbSO_4$	4
Diphosphorus Pentoxide	P_2O_5	5
Potassium Chromate	K_2CrO_4	4
Try this! ★ Calcium ~~Chlorate~~ Bismite	$Ca(BiO_3)_2$	6

Molar Mass or Formula Mass (g/m) of a compound is determined by adding up the mass of everything in the compound. Determine the Molar Mass of the following:

Name	Formula	Molar Mass (grams/mole)
Ethane	C_2H_6	30.0 g/mol
Phosphorus Trichloride	PCl_3	137.5
Lead II Nitrate	$Pb(NO_3)_2$	331.2
Dinitrogen Pentoxide	N_2O_5	108
Ammonium Carbonate	$(NH_4)_2CO_3$	96
Strontium Cyanide	$Sr(CN)_2$	139.6
Sodium Bicarbonate	$NaHCO_3$	84
~~Dinitrogen Pentoxide~~	~~N_2O_5~~	~~108~~

List the 7 elements that are diatomic: HON VII

H_2	O_2	N_2	Cl_2
Br_2	I_2	F_2	

Name: KEY Date: Block:

Calculating Grams & Moles & Liters

Use the chart to **help you answer** the questions below it.

#	Formula	Name	Formula mass/ molar mass	Show your work & circle your answers
1	CaO	Calcium Oxide	$56.1\ g/mol$	$\frac{14.5\ g \mid 1\ mol}{56.1\ g} = .258\ mol\ CaO$
2	$Ba(OH)_2$	Barium hydroxide	$171.3\ g/mol$	$\frac{1.89\ mol \mid 171.3\ g}{1\ mol} = 324\ g$
3	$MgCl_2$	Magnesium Chloride	$95.3\ g/mol$	$\frac{1.34\ g \mid 1\ mol}{95.3\ g} = .014\ mol$
4	CCl_4	Carbon Tetra-Chloride	$154\ g/mol$	$\frac{4.67\ g \mid 1\ mol}{154\ g} = .0303\ mol$
5	$SO_{2\,(g)}$	Sulfur dioxide	$64.1\ g/mol$	$\frac{0.34\ mol \mid 22.4\ L}{1\ mol} = 7.6\ L\ SO_2$
6	Ag_2O	Silver Oxide	$231.8\ g/mol$	$\frac{1.26\ mol \mid 231.8\ g}{1\ mol} = 292\ g$
7	$Ba(NO_3)_2$	Barium Nitrate	$261.3\ g/mol$	$\frac{1.345\ g \mid 1\ mol}{261.3\ g} = .005147\ mol$
8	$N_{2(g)}$	Nitrogen gas	$28.0\ g/mol$	$\frac{2.45\ L \mid 1\ mol}{22.4\ L} = .109\ mol\ N_2$

1. How many moles are in 14.5 grams of calcium oxide?
2. How many grams are in 1.89 moles of barium hydroxide?
3. How many moles are in 1.34 grams of magnesium chloride?
4. How many moles are in 4.67 g of CCl_4?
5. How many liters are in 0.34 moles of SO_2 gas? (@ STP)
6. How many grams are in 1.26 moles of silver oxide?
7. How many formula units are in 1.345 grams of barium nitrate?
8. How many mole are in 2.45 liters of nitrogen gas? (@ STP)