

Periodic Table of the Elements

1 IA 1A		2 IIA 2A		VIII										16 VIA 6A		17 VIIA 7A		18 VIIIA 8A																
Atomic Number	Symbol	Valence Charge	Name	Atomic Mass																														
1	H	+1	Hydrogen	1.008	3	Li	+1	Lithium	6.941	11	Na	+1	Sodium	22.990	19	K	+1	Potassium	39.098	37	Rb	+1	Rubidium	84.468	55	Cs	+1	Cesium	132.905	87	Fr	+1	Francium	223.020
4	Be	+2	Beryllium	9.012	12	Mg	+2	Magnesium	24.305	20	Ca	+2	Calcium	40.078	38	Sr	+2	Strontium	87.62	56	Ba	+2	Barium	137.327	88	Ra	+2	Radium	226.025					
5	V	+5,+4,+3	Vanadium	50.942	23	Ti	+4	Titanium	47.88	41	Nb	+5	Niobium	92.906	73	Ta	+5	Tantalum	180.948	105	Db	unk	Dubnium	[262]	104	Rf	+4	Rutherfordium	[261]					
6	Cr	+6,+3,+2	Chromium	51.996	24	Cr	+6,+3,+2	Chromium	51.996	42	Mo	+6,+4	Molybdenum	95.95	74	W	+6,+4	Tungsten	183.85	106	Sg	unk	Seaborgium	[266]	108	Hs	unk	Hassium	[268]					
7	Mn	+7,+4,+2	Manganese	54.938	25	Mn	+7,+4,+2	Manganese	54.938	43	Tc	+7,+4	Technetium	98.907	75	Re	+7,+4,+3	Rhenium	186.207	107	Bh	unk	Bohrium	[264]	109	Mt	unk	Meitnerium	[269]					
8	Fe	+3,+2	Iron	55.833	26	Fe	+3,+2	Iron	55.833	44	Ru	+4,+3	Ruthenium	101.07	76	Os	+4,+3	Osmium	190.23	110	Ds	unk	Darmstadtium	[269]	112	Cn	unk	Copernicium	[271]					
9	Co	+3,+2	Cobalt	58.933	27	Co	+3,+2	Cobalt	58.933	45	Rh	+3	Rhodium	102.906	77	Ir	+4,+3	Iridium	186.22	111	Rg	unk	Roentgenium	[272]	113	Uut	unk	Ununtrium	unk					
10	Ni	+3,+2	Nickel	58.933	28	Ni	+3,+2	Nickel	58.933	46	Pd	+4,+2	Palladium	106.42	78	Pt	+4,+2	Platinum	195.08	112	Cn	unk	Copernicium	[271]	114	Fl	unk	Flerovium	[289]					
11	Cu	+2,+1	Copper	63.546	29	Cu	+2,+1	Copper	63.546	47	Ag	+1	Silver	107.868	79	Au	+3	Gold	196.967	111	Rg	unk	Roentgenium	[272]	113	Uut	unk	Ununtrium	unk					
12	Zn	+2	Zinc	65.39	30	Zn	+2	Zinc	65.39	48	Cd	+2	Cadmium	112.411	80	Hg	+2,+1	Mercury	200.59	112	Cn	unk	Copernicium	[271]	114	Fl	unk	Flerovium	[289]					
13	Al	+3	Aluminum	26.982	31	Ga	+3	Gallium	69.723	49	In	+3	Indium	114.818	81	Tl	+3,+1	Thallium	204.383	113	Uut	unk	Ununtrium	unk	115	Uup	unk	Ununpentium	unk					
14	Si	+4	Silicon	28.086	32	Ge	+4	Germanium	72.61	50	Sn	+2,+4	Tin	118.71	82	Pb	+2	Lead	207.2	114	Fl	unk	Flerovium	[289]	116	Lv	unk	Livermorium	[293]					
15	P	+5,+3	Phosphorus	30.974	33	As	+5,+3	Arsenic	74.922	51	Sb	+3	Antimony	121.760	83	Bi	+3	Bismuth	208.980	115	Uup	unk	Ununpentium	unk	117	Uus	unk	Ununseptium	unk					
16	S	+6,-2	Sulfur	32.06	34	Se	+4,+2	Selenium	78.972	52	Te	+4	Tellurium	127.6	84	Po	+4	Polonium	[209]	116	Lv	unk	Livermorium	[293]	118	Uuo	unk	Ununoctium	unk					
17	Cl	-1	Chlorine	35.453	35	Br	+5,-1	Bromine	79.904	53	I	+5,-1	Iodine	126.904	85	At	+5,-1	Astatine	208.987	117	Uus	unk	Ununseptium	unk	119	Uu	unk	Ununnonium	unk					
18	Ar	0	Argon	39.948	36	Kr	0	Krypton	84.80	54	Xe	0	Xenon	131.29	86	Rn	0	Radon	222.018	118	Uuo	unk	Ununoctium	unk										

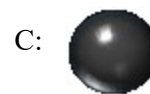
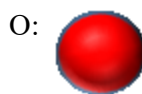
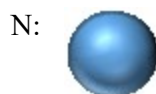
Lanthanide Series		Actinide Series	
57	La	89	Ac
58	Ce	90	Th
59	Pr	91	Pa
60	Nd	92	U
61	Pm	93	Np
62	Sm	94	Pu
63	Eu	95	Am
64	Gd	96	Cm
65	Tb	97	Bk
66	Dy	98	Cf
67	Ho	99	Es
68	Er	100	Fm
69	Tm	101	Md
70	Yb	102	No
71	Lu	103	Lr

- Alkali Metal
- Alkaline Earth
- Transition Metal
- Basic Metal
- Semimetal
- Nonmetal
- Halogen
- Noble Gas
- Lanthanide
- Actinide

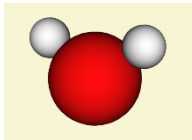
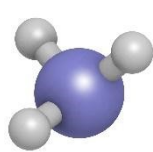
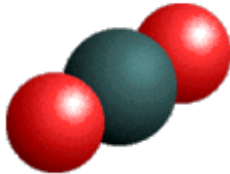


Part 1

1.) Here are three elements,



which will use to create three different molecules. Look at the pattern of the different elements and write the molecular formula. Additionally, consult the periodic table to determine the mass of each molecule.

			
Molecular formula			
Mass of 1 molecule (AMU)			
Mass of 1 molecule (grams)			

2.) How many molecules do we need to be able to weigh a sample with a lab balance? Explain your answer. Will your answer be the same for all the molecules?

Number of molecules			
Mass (grams)			

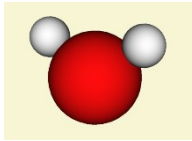
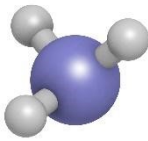
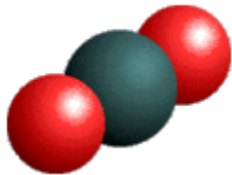
Part 2

1.) How many atoms are in there in 12.0 grams of Carbon-12?

2.) How does your answer from Part 1 #2 compare with Part 2 #1?



3.) The number you calculated in the #2 is called a “**mole**”. (No, not our furry friend to the right.) Calculate the mass a mole of each of the three molecules.

			
Mass of 1 molecule (AMU)			
Mass of 1 mole (grams)			
Mass Part 1 #2 (grams)			

Exercise 5

What will happen if we do the same table but with an element instead of a molecule? Pick a metal and complete the table below.

Metal: _____

Number of atoms	Mass (amu)	Mass (g)
1 atom		
Answer from Part 1 #2		
1 mole		

Reflection

- 1.) Explain the concept of a mole in a few sentences.

- 2.) Why is the mole a useful concept in Chemistry? Would it be helpful in finance? Or sports? Explain your answers.