Nomenclature Worksheet Part 2-Binary Molecular Compounds.

When two different elements combine, they form a binary compound. We have seen some ionic binary compounds such as sodium chloride, NaCl, or copper(II) oxide, CuO. But, non-metals can also form binary compounds, the most famous of which is water, H_2O. We have learned how to name binary ionic compounds. In this worksheet, we will practice naming binary molecular compounds.

Binary molecular compounds are held together by covalent bonds. As in ionic compounds, the more metallic element is listed first, and the less metallic is listed second. This coincides with the concept of electronegativity (and the converse, electropositivity) that we discussed in class. So, another way of stating this is the more electropositive element is written first followed by the more electronegative element. An example of this is SF_6, Notice that sulfur is more electropositive than fluoride and is written first. If both elements are in the same group, the element with the higher period number goes first. We see this in the formulas of SO_2 and IBr.

Binary molecular compounds differ from ionic compounds in a key way: we can't use charge to name the compound. So how will we distinguish CO_2 from CO, NO_2 from N_2O? We will use need a different system from ionic nomenclature.

In ionic nomenclature, we use charges and the position on the periodic table to indicate the number and types of ions in the compounds. The charges are whole numbers. Binary molecules can have fractional charges and multiple compounds for the combination of elements.

<u>THE SYSTEM-It's Greek to me!</u>

Since binary molecules can form a variety of combinations, the nomenclature system needs to reflect the different ratios that can form. We will use a system that specifies the number of each type of atom in the molecule. The rules are similar to naming ionic compounds. The first element in the formula gets the elemental name. The second element in the formula is given the elemental root name plus *–ide.* A Greek prefix is used to signify the number of atoms of each element is present in the formula.

1 mono-	*5 penta-*	*9 nona-*
2 di-	*6 hexa-*	*10 deca-*
3 tri	*7 hepta-*	
4 tetra-	*8 octa-*	

If there is only one of the first element in the formula, the mono-prefix is dropped:

Sulfur dioxide SO_2 not monosulfur dioxide

For each of the following, give the name if a formula is listed or the formula if a name is listed:

	Answer
disulfur dichloride	
bromine trichloride	
dinitrogen monoxide	
xenon trioxide	
sulfur tetrafluoride	
nitrogen monoxide	
iodine heptafluoride	
Diphosphorus pentoxide	
Phosphorus pentachloride	
Carbon disulfide	
Ammonia	
UF_6	

N_2S_3	
P_2S_5	
CCl_4	
CO	
PCl_3	
SF_6	

S_2Cl_2, $BrCl_3$, N_2O, XeO_3, SF_4, NO, $IF_&$, P_2O_5, PCl_5, CS_2, NH_3, Uranium hexafluoride, Dinitrogen trixulfide, Diphosphorus pentasulfide, Carbon tetrachloride, Carbon monoxide, Phosphorus trichloride, Sulfur hexafluoride,