Naming Compounds HW #1 KEY

Fill in all these boxes properly. Get out your periodic table to do this.
2 examples: one METAL that makes a positive cation, and a NONMETAL that forms a negative anion.

atom	# protons (atomic number)	ground state e^- configuration	ion e^- configuration (noble gas it's isoelectric to?)		#electrons in ion	ionic symbol
Li	3	2-1	2	He	2	Li^{+1}
F	9	2-7	2-8	Ne	10	F^{-1}
Be	4	2-2	2	He	2	Be^{+2}
Mg	12	2-8-2	2-8	Ne	10	Mg^{+2}
K	19	2-8-8-1	2-8-8	Ar	18	K^{+1}
Cl	17	2-8-7	2-8-8	Ar	18	Cl^{-1}
N	7	2-5	2-8-8	Ar	18	N^{-3}
O	8	2-6	2-8-8	Ar	18	O^{-2}
Na	11	2-8-1	2-8	Ne	10	Na^{+1}
P	15	2-8-5	2-8-8	Ar	18	P^{-3}
S	16	2-8-6	2-8-8	Ar	18	S^{-2}
Mg	12	2-8-2	2-8	Ne	10	Mg^{+2}
Br	35	2-8-18-7	2-8-18-8	Kr	36	Br^{-1}

Compounds HW #2 - Naming simple ionic compounds KEY

name:

1st name rule: name the metal cation, it is always the same name as the metal atom
2nd name rule: name the non-metal anion but change the ending to be -ide.
(oxygen becomes oxide, sulfur becomes sulfide, bromine becomes bromide, etc.)

No matter what the ratio of cations to anions is, we use the single metal name and the single anion name.
For each pair of metals and nonmetals, write the ions symbols with charges, write the neutral formula for the ionic compound that they form, then, name the compound.

Metal	Non-metal	Cation that forms	Anion that forms	Compound that forms	Compound name
Ba	S	Ba^{+2}	S^{-2}	BaS	barium sulfide
Rb	N	Rb^{+1}	N^{-3}	Rb_3N	rubidium nitride
Li	O	Li^{+1}	O^{-2}	Li_2O	lithium oxide
Al	F	Al^{+3}	F^{-1}	AlF^3	aluminum fluoride
Sr	S	Sr^{+2}	S^{-2}	SrS	strontium sulfide
Na	Br	Na^{+1}	Br^{-1}	NaBr	sodium bromide
Ca	O	Ca^{+2}	O^{-2}	CaO	calcium oxide
Cs	P	Cs^{+1}	P^{-3}	Cs_3P	cesium phosphide
Be	O	Be^{+2}	O^{-2}	BeO	beryllium oxide
Mg	N	Mg^{+2}	N^{-3}	Mg_3N_2	magnesium nitride
K	O	K^{+1}	O^{-2}	K_2O	potassium oxide
Na	P	Na^{+1}	P^{-3}	Na^3P	Sodium phosphide

Compound HW #3 - Naming Transitional Metal compounds KEY

name

Cation	Anion	Formula	name
Cu^{+2}	S^{-2}	CuS	Copper II sulfide
Ni^{+3}	O^{-2}	Ni_2O_3	Nickel III oxide
Pb^{+4}	O^{-2}	PbO_2	Lead IV oxide
Pb^{+2}	O^{-2}	PbO	Lead II oxide
Ti^{+4}	Cl^{-1}	$TiCl_4$	Titanium IV chloride
Cr^{+6}	O^{-2}	CrO_3	Chromium VI oxide
Mn^{+4}	S^{-2}	MnS_2	Manganese IV sulfide
Mn^{+7}	S^{-2}	Mn_2S_7	Manganese VII sulfide
Ta^{+5}	I^{-1}	TaI_5	Tantalum iodide

Name	Cation	Anion	Formula
tin (IV) fluoride	Sn^{+4}	F^{-1}	SnF_4
niobium (V) phosphide	Nb^{+5}	P^{-3}	Nb_3P_5
bismuth (III) chloride	Bi^{+3}	Cl^{-1}	$BiCl_3$
iron (III) oxide	Fe^{+3}	O^{-2}	Fe_2O_3
iron (II) oxide	Fe^{+2}	O^{-2}	FeO
gold (I) sulfide	Au^{+1}	S^{-2}	Au_2S
gold (III) selenide	Au^{+3}	Se^{-2}	Au_2Se_3
yttrium oxide	Y^{+3}	O^{-2}	Y_2O_3
silver sulfide	Ag^{+1}	S^{-2}	Ag_2S

Reactions HW #4 - Molecular Compounds KEY

name

	Names		Formulas
N_2O_5	Dinitrogen pentoxide	hydrogen mono iodide	HI
SO_3	Sulfur trioxide	silicon difluoride	SiF_2
PCl_3	Phosphorous trichloride	dinitrogen monoxide	N_2O
NF_4	Nitrogen tetrafluoride	fluorine monobromide	FBr
PBr_3	Phosphorous tribromide	arsenic trichloride	$AsCl_3$
CCl_4	Carbon tetrachloride	sulfur dioxide	SO_2
H_2S	Dihydrogen monosulfide	phosphorous pentabromide	PBr5
I_4F_7	Tetraiodine heptafluoride	diarsenic decabromide	As_2Br_{10}
$SeCl_4$	Selenium tetrachloride	tri-tellurium dichloride	Te_3Cl_2

More on the back!

Make a "T" chart with ALL the selected oxidation numbers and show all possible nitrogen/oxygen compounds (formulas and names). Nitrogen has 8 oxidation states, but oxygen only has one. Match each nitrogen oxidation number up against the -2 that oxygen always has. The "pairs' that can sum to zero "work". The -3, -2, and -1 cannot combine with a -2 in any ratio to sum to zero, so they are "out" immediately.

N	O		
-3	-2	These "do not work". There is no way that two negatives can ever sum to zero, so these oxidation numbers for nitrogen are NOT USED when bonding to oxygen. Below are the five possible N-O compounds.	
-2			
-1			
+1		+1 and -2 → N_2O	Dinitrogen monoxide
+2		+2 and -2 → NO	nitrogen monoxide
+3		+3 and -2 → N_2O_3	Dinitrogen trioxide
+4		+4 and -2 → NO_2	nitrogen dioxide
+5		+5 and -2 → N_2O_5	dinitrogen pentoxide

Make a "T" chart with ALL the selected oxidation numbers, and show all possible arsenic/chlorine compounds (formulas and names)

As	Cl		
-3	-1	Double negatives DO NOT WORK	
+3	+1	-3 and +1 → $AsCl_3$	Arsenic trichloride
+5	+5	-3 and +5 → As_5Cl_3	Penta-arsenic trichloride
	+7	-3 and +7 → As_7Cl_3	Hepta-arsenic trichloride
		Double positives DO NOT WORK EITHER	
Matches the top		+3 and -1 → $AsCl_3$	Arsenic trichloride
		+5 and -1 → $AsCl_5$	Arsenic pentachloride
There are 4 different possible Arsenic-chloride compounds			

Naming Compounds HW #5 KEY name		
Write the formulas or names for these compounds (ionic and molecular).		
1	tin II chlorate	$Sn(ClO_3)_2$
2	osmium III carbonate	$Os_2(CO_3)_3$
3	$AsBr_3$	Arsenic tribromide
4	tin IV chlorite	$Sn(ClO_2)_4$
5	BP	Boron monophosphide
6	CSe_2	Carbon diselenide
7	chromium VI permanganate	$Cr(MnO_4)_6$
8	ZnO	Zinc oxide
9	$Ir(NO_3)_4$	Iridium (IV) nitrate
10	Tungsten oxide	WO_2
11	YP	Yttrium phosphide
12	dinitrogen trioxide	N_2O_3