Type I & II Ionic Binary Nomenclature

Type I
metal & nonmetal

1.) Names
- write the name of the metal cation.
- write the name of the nonmetal anion, & change its ending to **-ide**

Ex)
$NaCl$
sodium chloride

CaF_2
calcium fluoride

Al_2O_3
aluminum oxide

K_3P
potassium phosphide

GaS
gallium sulfide
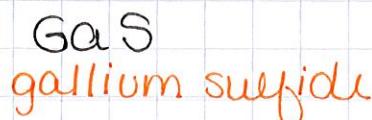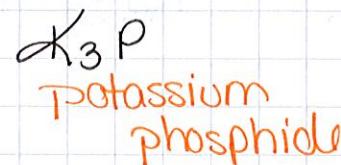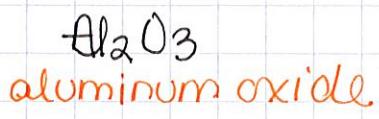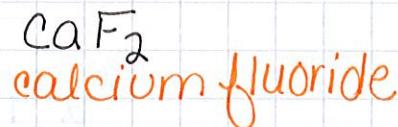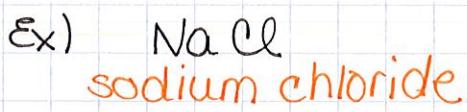
2.) Formulas
- write the symbol & charge of both metal & nonmetals ions.
- ~~add subscripts so that the overall charge adds up to zero.~~
- criss-cross charges & drop the +/- signs. Simplify if you need to.

Ex)
beryllium fluoride

$\overset{+2}{Be} \overset{1-}{(F)}_2$ $\overset{+2}{Be} \overset{-1}{F}$

BeF_2 BeF_2

gallium nitride

$\overset{+3}{Ga} \overset{-3}{N}$

GaN

Ga_3N_3
simplify
GaN

aluminum oxide

$\overset{+3}{Al} \overset{+3}{Al} \overset{-2}{O} \overset{-2}{O} \overset{-2}{O}$

Al_2O_3

$\overset{+3}{Al} \overset{-2}{O}$

Al_2O_3

Ex) magnesium arsenide

Mg^{2+} As^{3-}

Mg_3As_2

germanium sulfide

Ge^{4+} S^{2-}

Ge_2S_4

GeS_2 must simplify

strontium iodide

Sr^{2+} I^{1-}

SrI_2
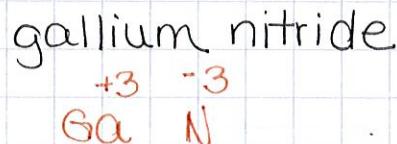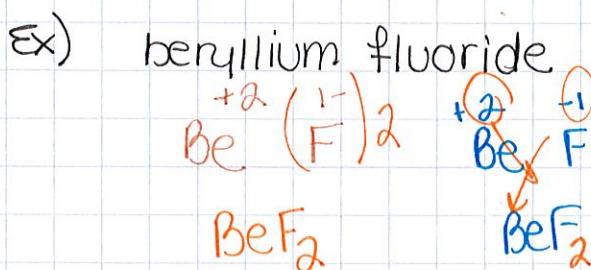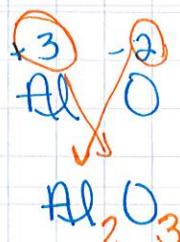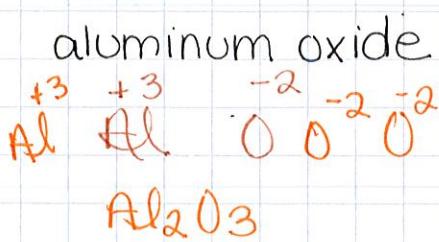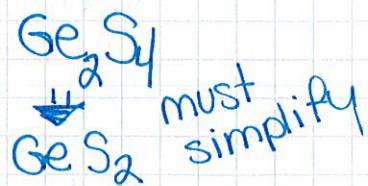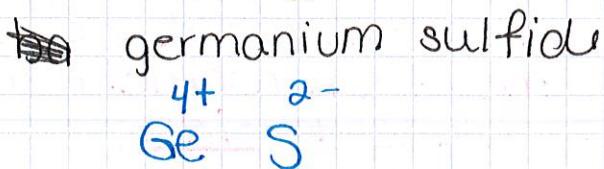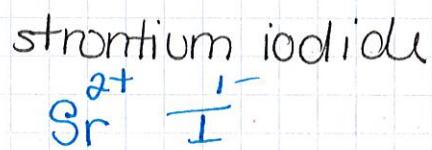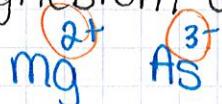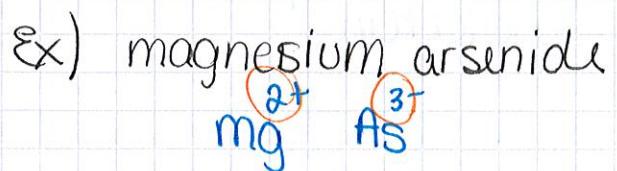
Type II
transition metal & a nonmetal
↓
* can have more than 1 charge (d-block e^- get involved).
* You will be told the charge, it's written as a Roman Numerals

Roman Numerals

1	I	6	VI
2	II	7	VII
3	III	8	VIII
4	IV	9	IX
5	V	10	X

1.) Formulas
- write the symbol & charge of transition metal & nonmetal ions
- criss-cross charges (drop +/- signs) & simplify if necessary.

Ex) iron (II) oxide   iron (III) oxide

$\overset{+2}{Fe} \quad \overset{2-}{O}$ $\overset{+3}{Fe} \quad \overset{-2}{O}$

FeO blue-gray compound Fe_2O_3 rust

vanadium (V) Phosphide   lead (IV) sulfide

$\overset{+5}{V} \quad \overset{-3}{P}$ $\overset{+4}{Pb} \quad \overset{-2}{S}$

V_3P_5 Pb_2S_4

          $\boxed{PbS_2}$

uranium (III) chloride   tin (II) nitride

$U^{3+} \quad Cl^{1-}$ $Sn^{2+} \quad N^{3-}$

UCl_3 Sn_3N_2