LOOK ON BACK FOR EXAMPLES OF EACH!

Naming Compounds Flowchart

Is there a METAL in the compound?

YES

Is the METAL a TRANSITION METAL?

NO

Count the different elements

2 elements
Metal / Nonmetal
Ionic Binary

- **Name metal first**
- **Name nonmetal second *and* change ending to** "-ide"

3 or more elements
Metal / Poly Ion
Ionic Ternary

- **Name metal first**
- **Name polyatomic ion second**
- ***DO NOT* change ending to** "-ide"

YES

Count the different elements

2 elements
Tran Metal / Nonmetal
Ionic Binary

- **Name transition metal first**
- *Determine charge of transition metal and write as Roman Numeral after name*
- **Name nonmetal second and change ending to** "-ide"

3 or more elements
Tran Metal / Poly Ion
Ionic Ternary

- **Name transition metal first**
- *Determine charge of transition metal and write as Roman Numeral after name*
- **Name polyatomic ion second**
- ***DO NOT* change ending to** "-ide"

NO

Is the first element Hydrogen?

NO

Count the different elements

1 element
Diatomic molecule

Br_2 I_2 N_2 Cl_2 H_2 O_2 F_2

- **Name the element**

2 elements
Covalent Binary

- **Name first element, using prefixes** (*except* "mono-")
  (Prefixes indicate how many of each element is in the compound)
- **Name second element, using prefixes** (*including* "mono-")
- **Change ending to** "-ide"

YES

Acid

H + Element
Hydro + *root anion* + **-ic acid**

H + Polyatomic ion
- **Poly ion ending in *–ate***
  Root anion + **-ic acid**
- **Poly ion ending in *–ite***
  Root anion + **-ous acid**

Root anion = *1st part of polyatomic ion name or element*

ROMAN NUMERALS

I	*one*
II	*two*
III	*three*
IV	*four*
V	*five*

DETERMINING THE CHARGE OF A TRANSITION METAL

1. Find the total charge of the **Anion**
   Anion Oxidation # x Anion Subscript
2. Determine charge of Transition Metal
   Total Anion charge ÷ Metal subscript
3. *Transition metal charge is always* ***positive (+)***

PREFIXES

Covalent Compounds ONLY:
Look at the subscripts to tell you how many of each element you have

One	***mono-***
Two	***di-***
Three	***tri-***
Four	***tetra-***
Five	***penta-***
Six	***hexa-***
Seven	***hepta-***
Eight	***octa-***
Nine	***nona-***
Ten	***deca-***

Example:

Fe_2O_3 $^{-2}$ ← Anion Oxidation # (charge)
← Anion Subscript
↑ Cation Subscript

Step 1: -2 x 3 = -6
Step 2: -6 ÷ 2 = -3
Step 3: +3 ***Charge of Fe***

Answer: **Iron III oxide**

Polyatomic Ion List

Ammonium	NH_4^+
Acet**ate**	$C_2H_3O_2^-$
Cyanide	CN^-
Carbon**ate**	CO_3^{-2}
Chlor**ate**	ClO_3^-
Chlor**ite**	ClO_2^-
Chrom**ate**	CrO_4^{-2}
Dichrom**ate**	$Cr_2O_7^{-2}$
Hydrogen carbon**ate**	HCO_3^-
Hydroxide	OH^-
Hypochlor**ite**	ClO^-
Nitr**ate**	NO_3^-
Nitr**ite**	NO_2^-
Perchlor**ate**	ClO_4^-
Permangan**ate**	MnO_4^-
Phosph**ate**	PO_4^{-3}
Phosph**ite**	PO_3^{-3}
Sulf**ate**	SO_4^{-2}
Sulf**ite**	SO_3^{-2}

IONIC COMPOUNDS EXAMPLES

Metal/Nonmetal

KCl _____

Al_2O_3 _____

Metal/Polyatomic Ion

$Mg(NO_3)_2$ _____

$NaC_2H_3O_2$ _____

Transition Metal/Nonmetal

Fe_2O_3 _____

$CuCl_2$ _____

Transition Metal/Polyatomic Ion

$CuCrO_4$ _____

$Zn(OH)_2$ _____

COVALENT COMPOUNDS EXAMPLES

Nonmetal/Nonmetal

P_2O_5 _____

CCl_4 _____

Metal/Polyatomic Ion

Cl_2 _____

Br_2 _____

ACID EXAMPLES

H + Element

- **HCl** _____
- **H_3P** _____

H + Polyatomic Ion

- **H_2SO_4** _____
- **H_2SO_3** _____
- **H_3PO_4** _____