# NaminG CompoUnds & CoUntinG atoms

## Try This!

Determine the chemical formulas for the following:

| Calcium + Chlorine | | Silver + Hydroxide | | Copper (II) + Nitrogen | |
|---|---|---|---|---|---|
| Write Ions Here | Write Formula Here | Write Ions Here | Write Formula Here | Write Ions Here | Write Formula Here |
| $Ca^{2+}$  $Cl^-$ | $CaCl_2$ | $Ag^+$  $OH^-$ | $AgOH$ | $Cu^{2+}$  $N^{3-}$ | $Cu_3N_2$ |

# What is in a Name?......................................

### Naming Metals (with one ion charge)

- The name of the metal ion is written ___first___
- The name is written in ___lowercase___ and spelled exactly the same as the element name
  ex. Al is ___aluminum___

### Naming Non-Metal Ions

- The name of the non-metal ion is written ___second___, after the metal.
- The name is written almost the same the element name except the ending is changed to ___-ide___ to distinguish from Polyatomic Ions
  ex. Cl is ___chloride___ and O is ___oxide___

### Naming Polyatomic Ions

- Positive polyatomic ions are written ___first___. There is only one, which is ___$NH_4^+$___.
- Negative polyatomic ions are written ___second___ and the name of the ion is not changed.
  ex. $SO_4^{2-}$ is ___sulfate___

### Naming Multivalent Metals

- If the metal is multivalent, like Iron ($Fe^{+2}$ and $Fe^{+3}$), the ion charge of the metal must be in the name. This charge is indicated by ___Roman numerals___.
  ex. $Cu^{+2}$ is ___copper (ii)___ and read as "___copper two___"

# The Summary

| POSITIVE (usually metal) ION FIRST | NEGATIVE (non-metal) ION SECOND |
|---|---|
|  |  |

# Put it into Practice

| | IONS | NAME OF COMPOUND | FORMULA |
|---|---|---|---|
| 1 | $K^{+1}$    $Cl^{-1}$ | potassium chloride | KCl |
| 2 | $Na^{+1}$    $N^{-3}$ | sodium nitride | $Na_3N$ |
| 3 | $Ca^{2+}$    $OH^-$ | calcium hydroxide | $Ca(OH)_2$ |
| 4 | $Al^{3+}$    $OH^-$ | aluminum hydroxide | $Al(OH)_3$ |
| 5 | $K^+$    $N^{3-}$ | potassium nitride | $K_3N$ |
| 6 | $Ca^{2+}$    $O^{2-}$ | calcium oxide | CaO |
| 7 | $Na^+$    $Cl^-$ | sodium chloride | NaCl |
| 8 | $Fe^{+2}$    $O^{2-}$ | iron(II) oxide | FeO |

| 9 | $Fe^{3+}$ $O^{2-}$ | iron (III) oxide | $Fe_2O_3$ |
|---|---|---|---|
| 10 | $Mg^{2+}$ $PO_4^{3-}$ | magnesium phosphate | $Mg_3(PO_4)_2$ |
| 11 | Fe (III)   Cl | iron (III) chloride | $FeCl_3$ |
| 12 | $K^+$ $PO_4^{3-}$ | potassium phosphate | $K_3PO_4$ |
| 13 | $H^+$ $OH^-$ | hydrogen hydroxide (should be able to tell this is ionic because hydroxide = ion) | $H OH$ |
| 14 | $Ca^{2+}$ $CO_3^{2-}$ | calcium carbonate | $CaCO_3$ |

## The Last Bit...............................................................................................................

## Counting Atoms 12345618 90 12345618 90 12345618 90

A small number called a ____subscript____, right next to a letter, indicates the number of atoms of an element in that compound.

If the subscript is next to a ____bracket____, then it multiples every element inside the bracket by that number.

*How many atoms of each element are in the compounds below?*

$Fe_2O_3$

2 Fe      3 O

Fe O

1 Fe    1 O

$Fe(OH)_2$

1 Fe    2 O    2 H

$FeOH_2$

1 Fe    1 O    2 H