

## 7.2 Formulas & Naming Ionic Compounds

**Learning Goals/Success Criteria:** At the end of this lesson, I will be able to:

- Write the formula and names of ionic compounds (metal + non-metal)

### Rules to follow when writing Formula and Naming Ionic Compounds:

Ion formed from elements

- a) Write the symbol for the metal FIRST, then the non-metal.
- b) Determine the ion charge each element would form (based on their valence electrons). Write the charge to the upper right of each ion.

REVIEW: What's the charge?

**METALS:** Group 1 or IA - 1+      Group 2 or IIA - 2+      Group 13 or IIIA - 3+

**NON-METALS:** Group 15 or VA - 3-      Group 16 or VIA - 2-      Group 17 or VIIA - 1-

- c) Determine the # of each ion needed to balance the charges.  
(NOTE: Short Cut - **CRISS CROSS RULE** here)

- d) Write the chemical formula - rewrite the symbols together (no spaces) with the number of each needed as 16h. (\*reduce if possible when subscripts have a common factor/divide into each other)

- e) Write the name of the metal first, then the non-metal by changing the ending to "ide".

Elements to Combine	a) b) Ion formed (Element symbol and charge)	c) Balance the charges (short cut: Criss Cross Rule)	d) Write the chemical formula	e) Name the compound
Magnesium Chlorine	$Mg^{2+}$ $Cl^{-}$	$MgCl_2$	$MgCl_2$	magnesium chloride
Calcium Nitrogen	$Ca^{2+}$ $N^{3-}$	$Ca_3N_2$	$Ca_3N_2$	calcium nitride
Calcium Oxygen	$Ca^{2+}$ $O^{2-}$	$Ca_2O_2$	$CaO$	calcium oxide
Sodium Chlorine	$Na^{+}$ $Cl^{-}$	$NaCl$	$NaCl$	sodium chloride

1. Complete the following table using rules a)-e).

Elements to Combine		a) b)	c)	d) e)
Metal	Nonmetal			
Potassium	Oxygen	$K^+ O^{2-}$	$K_2O$	$K_2O$ potassium oxide
Magnesium	Iodine	$Mg^{2+} I^-$	$MgI_2$	$MgI_2$ magnesium iodide
Calcium	Iodine	$Ca^{2+} I^-$	$CaI_2$	$CaI_2$ calcium iodide
Zinc	Chlorine	$Zn^{2+} Cl^-$	$ZnCl_2$	$ZnCl_2$ zinc chloride
Sodium	Sulfur	$Na^+ S^{2-}$	$Na_2S$	$Na_2S$ sodium sulphide
Calcium	Phosphorus	$Ca^{2+} P^{3-}$	$Ca_3P_2$	$Ca_3P_2$ calcium phosphide
Magnesium	Fluorine	$Mg^{2+} F^-$	$MgF_2$	$MgF_2$ magnesium fluoride

2. Name the following compounds:

a) KI potassium iodide

b)  $BaI_2$  barium iodide

c)  $MgS$  magnesium sulphide

d)  $Ag_2O$  silver oxide

e) NaF sodium fluoride

f)  $K_3N$  potassium nitride

3. Provide the name ONLY for the following compounds formed from these pairs of elements:

a) lithium and bromine - lithium bromide

b) iron (III) and chlorine - iron<sup>(III)</sup> chloride

c) potassium and sulphur - potassium sulphide

d) nitrogen and sodium - sodium nitride

e) sulphur and beryllium - beryllium sulphide

f) phosphorus and lithium - lithium phosphide