Name: _____ Date: _____

Lesson 7 Polyatomic Ions and Compounds (Nelson p.181-183)

Learning Goals:

A. Identify simple compounds involving polyatomic ions, using the periodic table and a list of most common polyatomic ions, and write the formulae (C3.8)

- _____**:** Groups of atoms that tend to stay together and carry on **OVERALL** _____. The group of atoms **do not separate** when they combine with other ions.
- The prefix **"poly"** means "_____".
- Each polyatomic ion has its own _____, _____, and _____.
- **Hydroxide**, **carbonate**, and **bicarbonate** are **NOT on the periodic table** because they are not elements.

Formulas and Charges of Common Polyatomic Ions (Nelson p.202)

Name of Polyatomic Ion	Ion Formula	Ionic Charge/CC
Nitrate	NO_3^-	- 1
Nitrite	NO_2^-	- 1
Hydroxide	OH^-	- 1
Hydrogen carbonate / Bicarbonate	HCO_3^-	- 1
Chlorate	ClO_3^-	- 1
Carbonate	CO_3^{2-}	- 2
Sulfate	SO_4^{2-}	- 2
Phosphate	PO_4^{3-}	- 3
Ammonium	NH_4^+	+ 1

The **negative polyatomic ions** act like **non-metals** in ionic compounds

Ammonium acts like a **metal** in ionic compounds

Naming Polyatomic Compounds

- A **polyatomic compound** has **2 parts**:
  - a **positive (metal / polyatomic)** ion
  - a **negative (polyatomic / non-metal)** ion
- To **name a polyatomic compound**:
  1) Name the **positive (metal) ion** first, using the name that appears on the periodic table.
  2) Name the **negative (polyatomic) ion** second.
  3) **DO NOT CHANGE** the **ending** of a polyatomic ion.

Examples:

metal name + polyatomic ion name

sodium + sulfate ion → sodium sulfate

Writing Chemical Formulas Using "Crisscross" Method

- **Parentheses ()** are always needed when a **subscript follows** a polyatomic ion.

Steps	sodium & nitrate	ammonium & phosphate	magnesium & sulfate
1. Write down the symbols of positive ion first.			
2. Write the ionic charge above the symbol.			
3. If applicable, divide the ionic charge by the highest common multiple. (i.e. reduce ratio)			
4. Criss-cross the ionic charge and drop the signs.			
5. Drop all 1's and add bracket when necessary. CHEMICAL FORMULA			
NAME OF COMPOUND			
Descriptions	1 **sodium** ion bonds with 1 **nitrate** ion	3 **ammonium** ions bond with 1 **phosphate** ion	1 **magnesium** ion bonds with 1 **sulfate** ion

Practice:

What is the formula of **potassium chlorate**?