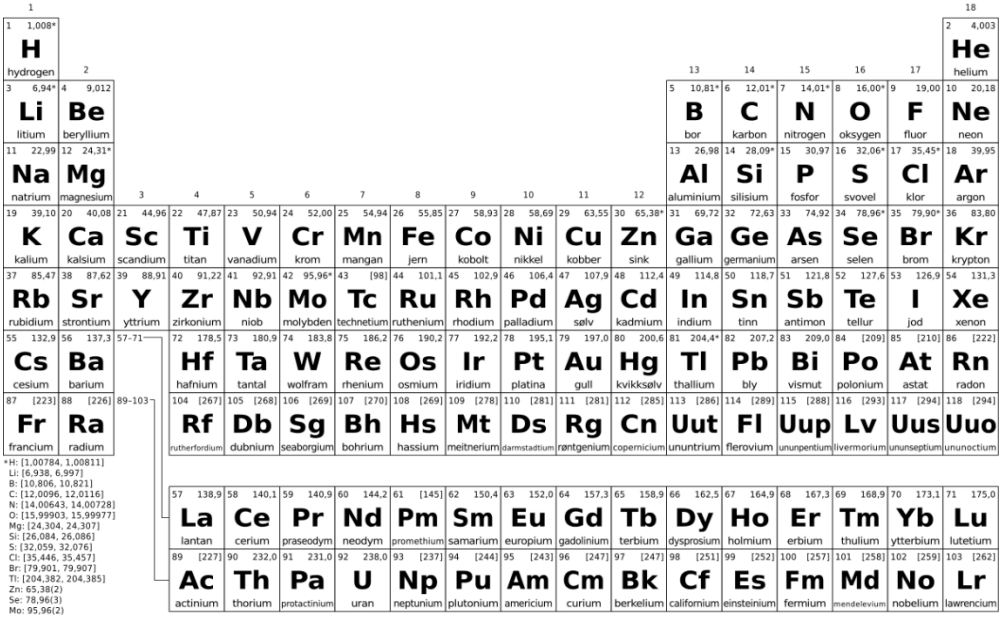
Unit 1: Chemistry Review

1 - Naming Compounds and Writing Formulae

A **compound** is a combination of **atoms**. There are two main ways that atoms can combine.

Ionic Compounds	Covalent Compounds
Combination of a _____ and _____ Electrons are _____ from the _____ to the _____. Eg. Magnesium chloride In ionic compounds the ratio of metal to non-metal ions is called the _____ _____	Combination of _____ Electrons are _____ between the _____. Eg. Water In covalent compounds the non-metal atoms group together to form _____.

Some reminders about the Periodic Table of the Elements



Writing Ionic Formulae

Example: Calcium Bromide

1) Write the symbol for the _____ first followed by the _____.

2) Determine the _____ on each ion from the periodic table.

3) Use the charges to determine the ratio of positive ions (_____) to negative ions (_____) that will produce a neutral compound.

4) Use _____ to indicate the amount of each ion required.

Exception #1: Polyatomic ions

Sometime molecules an have an overall charge. We can treat them as a single ion.

Example: Aluminum Nitrate

Follow the same steps as above, but use the list of polyatomic ions on the back of your periodic table.

Exception #2: Multivalent metals

Some metals can exist as a stable ion with more than one charge (or _____ _____)

For these metals, use the same steps as above but use roman numerals to indicate the charge on the ion.

Example: Iron (III) Oxide

Writing Ionic Names

Example: Mg_3N_2 1) Use the formula to find the names of the metal and non-metal. 2) Change the ending of the non-metal ion to _____.	
Example: $Al_2(SO_3)_3$ If there is a polyatomic ion, you can find the name on the back of the periodic table.	
Example: MnO_2 If the metal ion is a _____ metal then you need to specify its charge (oxidation state).	

Writing Covalent Names

1) When non-metals form compounds, they can often do so in a variety of ways. To specify the number of each atom we use _____ 2) The prefixes are as follows: * Note that we never start with _____ 3) Change the ending of the last non-metal to _____.	***Examples:*** ***N_2O_5*** ***P_4S_7*** ***CO_2*** ***I_2Cl_6***

Writing Covalent Formulae

Examples:	***Dihydrogen monoxide***	***Trisulphur pentachloride***	***Iodine heptafluoride***

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2 – Balancing Equations

When chemicals react, they always follow the _____ ___ _____ ___ _____

This means that matter cannot be _____ or _____. Essentially the amount of each atom that we start with (aka _____) must be the same as what we end up with (aka _____).

Consider the reaction of hydrogen and oxygen to form water:

$$H_2 + O_2 \rightarrow H_2O$$

When the number of atoms on the reactant side does not match the number of atoms on the product side, we say that the reaction is _____.

In order to fix this, we add _____ in front of the chemicals until it is **balanced**.

Note: You CANNOT change the subscripts, only the coefficients (why is that….?)

Examples:

$$\_\_\_\ Na + \_\_\_\ O_2 \quad \_\_\_\ Na_2O$$

$$\_\_\_\ HCl + \_\_\_\ NaOH \quad \_\_\_\ NaCl + \_\_\_\ H_2O$$

$$\_\_\_\ N_2 + \_\_\_\ O_2 \quad \_\_\_\ N_2O_5$$

$$\_\_\_\ H_3PO_4 + \_\_\_\ Mg(OH)_2 \quad \_\_\_\ Mg_3(PO_4)_2 + \_\_\_\ H_2O$$

Types of Reactions

In Chemistry 11 we will be looking at 6 main types of reactions.

Synthesis

General:

Example:

___ C + ___ S_8

Decomposition

General:

Example:

___ NH_3

Single Replacement

General:

Example:

___ K + ___ B_2O_3

Double Replacement

General:

Example:

___KI + ___$Pb(NO_3)_2$

Acid-Base Neutralization

General:

Example:

___ H_3PO_4 + ___ $Mg(OH)_2$

Hydrocarbon Combustion

General:

Example:

___ C_2H_6 + ___ O_2

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3 – Unit Conversions

Relationship	Conversion Factor

To convert between units we will:

1) Start with the _____ _____

2) _____ by the correct conversion factor

3) _____ until we reach the desired unit

Example: How many seconds are in 18 minutes?

Examples:

1) How many eggs are in 14 dozen?

2) One molecule of phosphite contains 4 atoms. How many phosphite molecules can be made with 448 atoms?

3) How many seconds have you been alive for at the exact moment you turn 16 years old?

4) The largest iceberg in the world requires 6.53×10^7kJ of heat energy to melt. One kilogram of TNT or dynamite releases 1.5×10^4kJ of energy when exploded. Provided that all of the energy of an explosion went into melting the iceberg, how many grams of TNT would be needed?

Calculations in chemistry often require using different units. In order to change from one unit to another we use a _____ _____ which is basically just a _____.