Topic 5 – Chemical Formulas and Equations

Lesson 4 – Chemical Equations

Terms to Know

Equation –

Nuclear Equation –

Physical Equation –

Chemical Equation –

Chemical Reaction –

Reactants –

Products –

Coefficient –

Arrow –

Synthesis –

Decomposition –

Single Replacement –

Double Replacement –

Combustion –

Law of Conservation in Reactions –

Conservation of Atoms –

Balanced Equations –

Conservation of Mass –

Equations show changes that are taking place in a substance.

**There are three types of changes in Chemistry**

* **Chemical change** – change in chemical composition of one or more substances to other substances

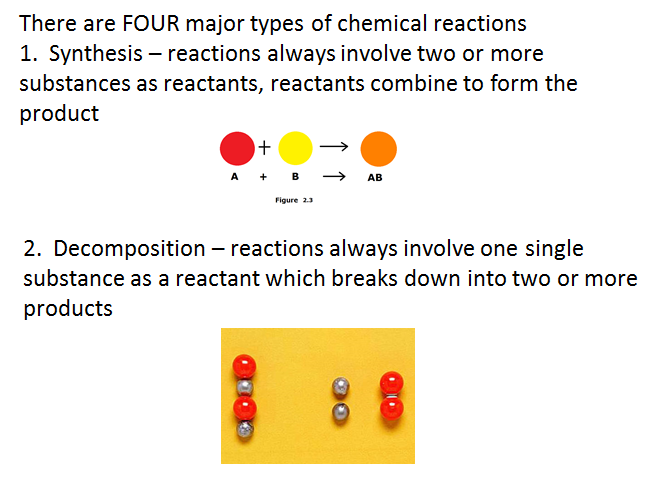
H2 (g) + O2 (g) 🡪 H2O(l)

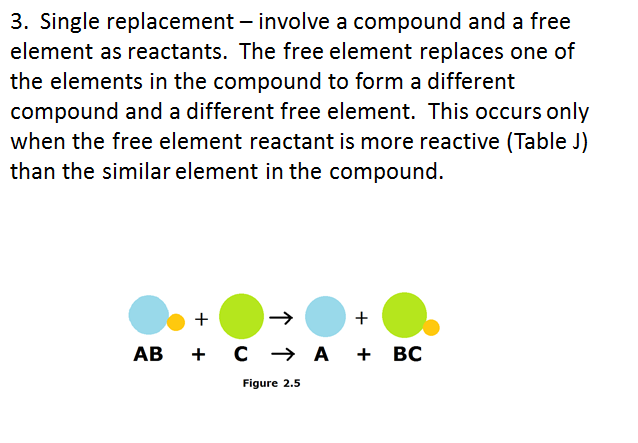
* **Physical change** – change of a substance from one form (phase) to a different form without changing its chemical composition

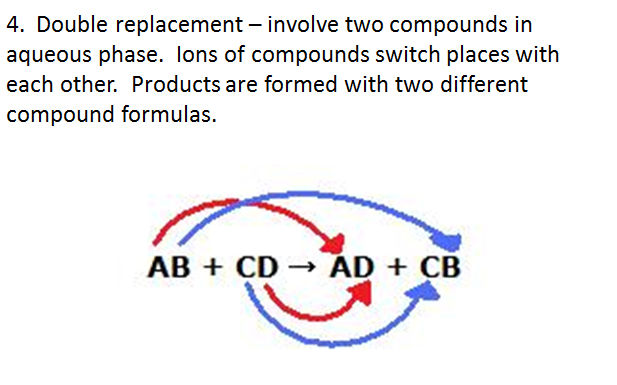
H2O(s) 🡪 H2O (l)

* **Nuclear change** – change in the nuclear contents of one atom into that of another atom

220 Fr 🡪 4 He + 216 At







**Law of conservation** states that during a chemical reaction: neither atoms, mas, charge nor energy are created nor destroyed. Atoms, mass, charges, and energy are the same before and after a reaction.

**A balanced chemical equation is a way of showing conservation in chemical reactions.**

N2 + 3H2 🡪 2NH3

Reactants Products

N 2 N 2

H 6 H 6

A balanced chemical equation contains the correct combinations of smallest whole-number coefficients that allow number of atoms on both sides of the equation to be equal.

**Strategies to balance chemical equations**

* Make a table to keep track of the number of atoms as you change coefficients
* Always try to balance one atom at a time
* Every time a coefficient is changed, RECOUNT the number of each atom affected by the change. Mark the change on the table.
* Always change coefficients of free elements last.
* Be sure that coefficients are in smallest whole-number ratio.

