

Lesson 10 Types of Chemical Reactions (Nelson p.222-224; p.246-247)

Learning Goals:

- A. Conduct and observe inquiries related to simple chemical reactions, including synthesis, decomposition, and displacement reactions and represent them using a variety of formats. (C2.3)

1. SYNTHESIS REACTION

✚ “Synthesis” means a _____.

✚ **2 or more smaller** reactants _____ to make **1 larger new product**.

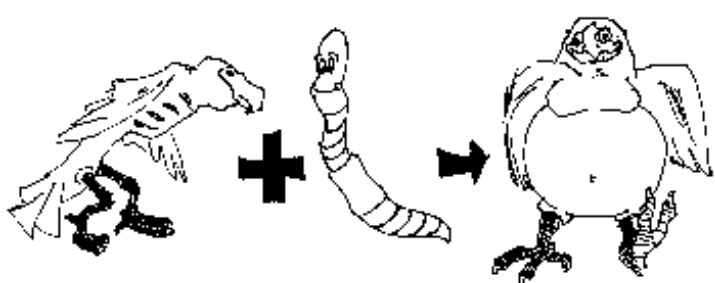
✚ The reactants can be _____ or _____.

✚ **General Form:**

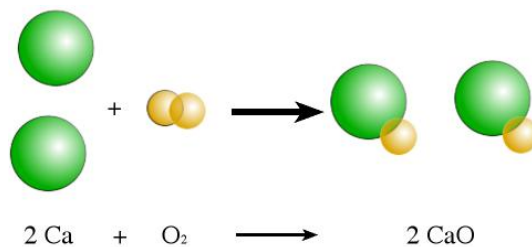


To visualize:

Skinny bird (reactant) and worm (reactant) combine to make one product – a fat bird.



EXAMPLES:



2. DECOMPOSITION REACTION

✚ **One larger** compound _____ into **two or more smaller products**

✚ One reactant produces 2 or more products.

✚ The products can be _____ or _____.

✚ Synthesis and decomposition reactions are _____.

✚ **General Form:**



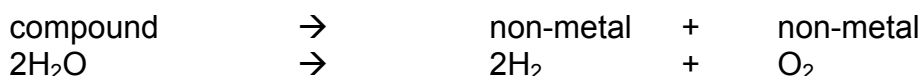
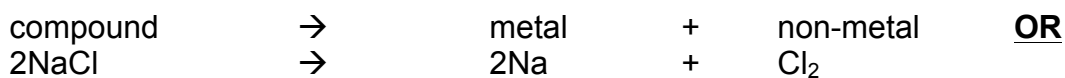
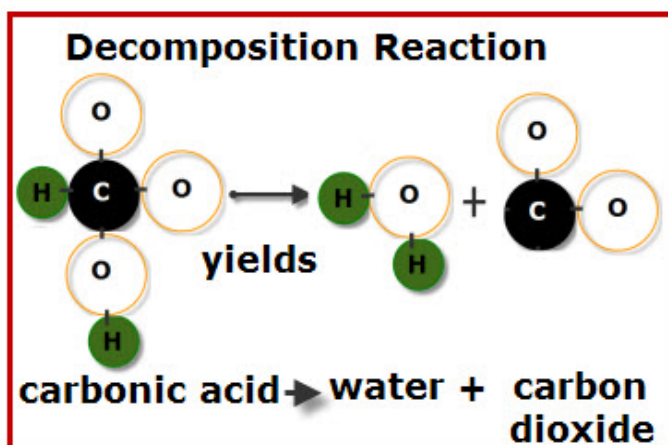
larger compound \rightarrow smaller compound + smaller compound

To visualize:

Egg (the reactant), which contained the turtle at one time, now has opened and the turtle (product) and egg shell (product) are now two separate substances.



EXAMPLES:



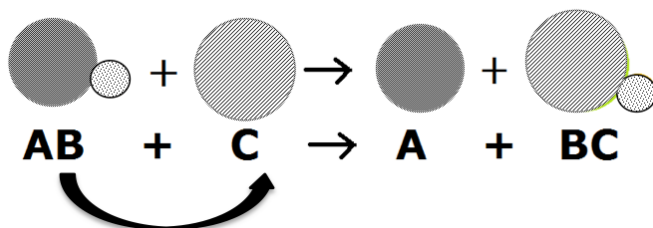
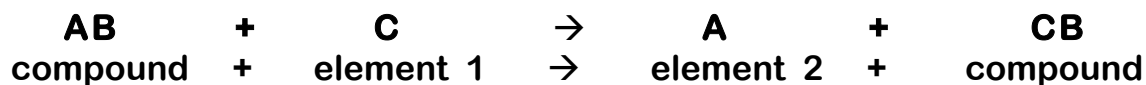
3. SINGLE DISPLACEMENT REACTION

✚ 1 element _____ another element in a compound.

✚ One **reactant** is always an _____.

✚ The **other reactant** will be a _____.

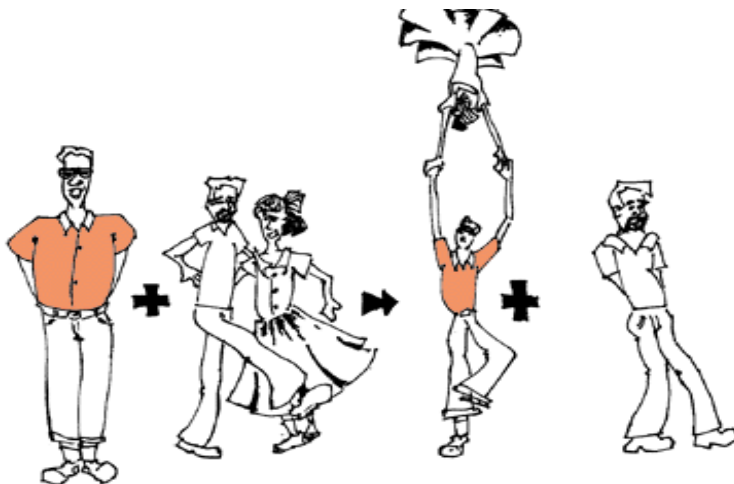
✚ **General Form:**



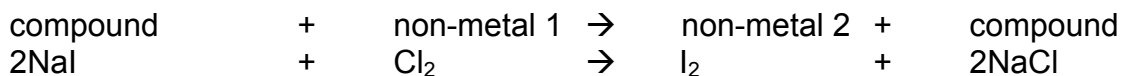
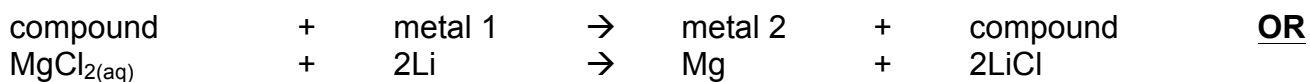
Metal replaces metal. Non-metal replaces non-metal.

To visualize:

The single guy steals the date of the other guy. So, a part of one of the reactants trades places and is in a different place among the products.



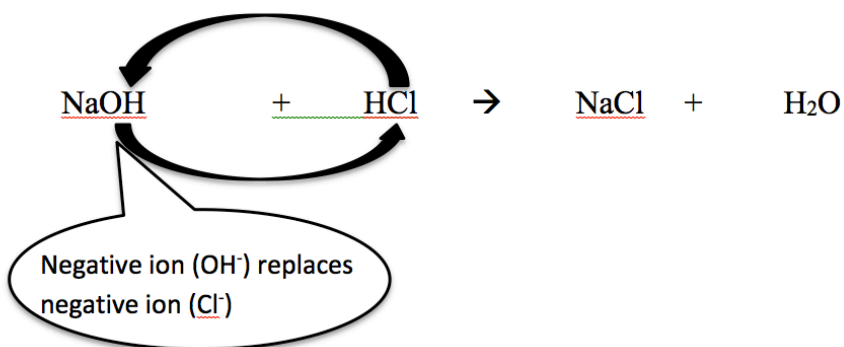
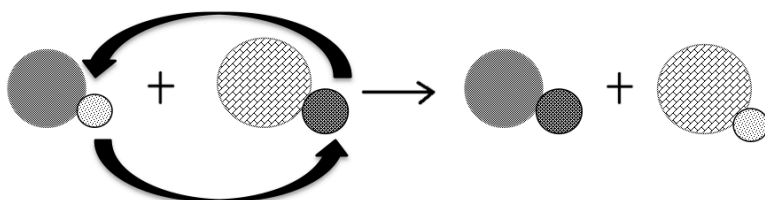
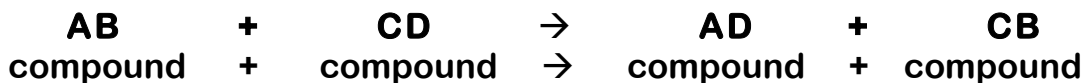
EXAMPLES:



4. DOUBLE DISPLACEMENT REACTION

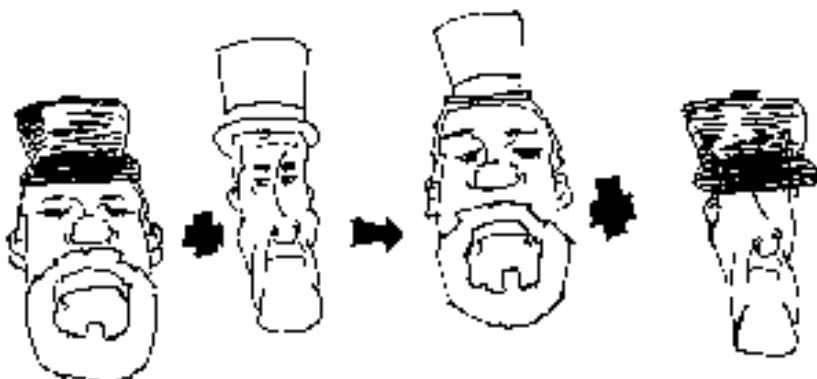
The _____ (metals) and _____ (non-metals) of **two different compounds** switch.

General Form:

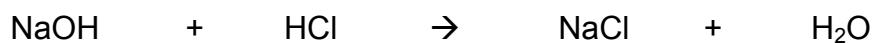


Metal replaces metal. Non-metal replaces non-metal.

To visualize:

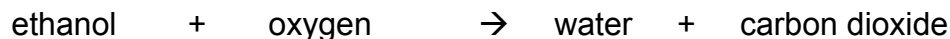


EXAMPLES:

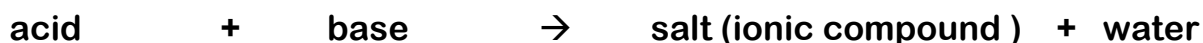


5. COMBUSTION REACTION (Nelson p.246-247)

Combustion means there is a reaction of _____ with a compound containing _____ . Combustion – _____

**EXAMPLES:****6. ACID-BASE REACTION (also a double-displacement reaction)**

When acids are mixed with bases, a _____ / _____ reaction occurs.

**EXAMPLES:****Summary of Types of Reactions (General Form)****1. Synthesis****2. Decomposition****3. Single Displacement****4. Double Displacement****5. Combustion****6. Acid-base**

A Checklist to identify the Types of Chemical Reactions

Follow this series of questions. When you can answer “YES” to a question, STOP!

1. Does your reaction have **oxygen** as one of its reactants and **carbon dioxide** and **water** as products?
If **YES**, then it's a **combustion** reaction.
2. Does your reaction have **two (or more)** chemicals **combining** to form **one** chemical?
If **YES**, then it's a **synthesis** reaction.
3. Does your reaction have **one large molecule** failing apart to make **several small ones**?
If **YES**, then it's a **decomposition** reaction.
4. Does your reaction have any molecules that contain **only one element**?
If **YES**, then it's a **single displacement** reaction.
5. Does your reaction have **water** as one of the products?
If **YES**, then it's a **acid-base (neutralization)** reaction.
6. If you haven't answered “yes” to any of the questions above, then you've got a **double displacement** reaction.