Chemical Reactions

Physical and Chemical Changes

- A **physical change** occurs when some of the properties of a material change, but the substances in the material stay the same.


Physical and Chemical Changes

- A **chemical change** occurs when a substance reacts and forms one or more new substances.


Physical and Chemical Changes

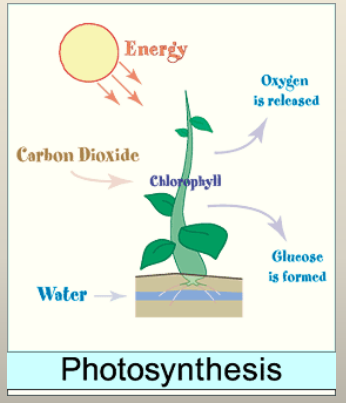
- Evidence of Chemical Changes
  - Unexpected change of color or temperature
  - Production of a gas
  - Formation of a **precipitate** (solid that forms and separates from a liquid mixture)


Chemical Equations

- Chemical equation – representation of a chemical reaction where reactants and products are expressed as formulas
- Reactants – substances that undergo a chemical change during a chemical reaction
- Products – substance(s) formed as result of chemical change during a reaction
- Ex:

$$CH_4 + O_2 \rightarrow CO_2 + H_2O$$

(Reactants) (Products)



Photosynthesis

$6CO_2$ Carbon dioxide + $6H_2O$ Water $\xrightarrow{\text{Light}}$ $C_6H_{12}O_6$ Sugar + $6O_2$ Oxygen

Conservation of Mass

- Law of Conservation of Mass – mass is neither created nor destroyed in a chemical reaction, it only changes form
- Mass of products is always equal to mass of reactants
- Ex.
  - Is mass conserved in the following reaction (rxn)?

$$H_2 + O_2 \rightarrow H_2O$$

- Reactions must be balanced so reactants equal the products