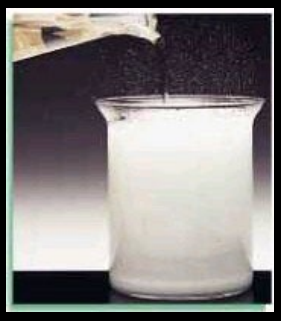
Indicators on chemical reactions

Gas formation – light production – explosion – temperature change – new odor production – color change – precipitate formed



TYPES OF CHEMICAL REACTIONS

Synthesis reaction

- Is when two substances combine and form a single compound

- It has the general formula : **reactant + reactant -> product**
- **EXAMPLES**
  - **Formation of water**
    - **$2H_2 + O_2 \rightarrow 2H_2O$**
  - **Formation of CO_2**
    - **$C + O_2 \rightarrow CO_2$**

Decomposition reaction

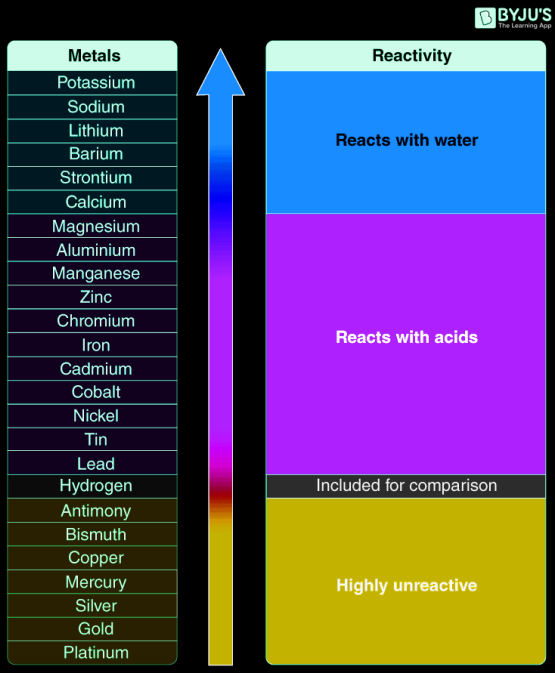
- It is the opposite of synthesis reaction, it occurs when compounds break up into simpler compounds

- It has the general formula : **product -> reactant + reactant**
- **EXAMPLES**
  - **Decomposition of water**
    - **$2H_2O \rightarrow 2H_2 + O_2$**
  - **Decomposition of mercury oxide**
    - **$2HgO \rightarrow 2Hg + O_2$**

Single Replacement reaction

- It when one element replaces another element that is less reactive in a compound, it happens with metals

- we determine if a metal is more reactive than another metal using the **chemical activity series**



- It has the general formula :
  - **A + BC -> AC + B**
  - **A + BC -> BA + C**
- **EXAMPLES**
  - Formation of iron sulfide and copper precipitate
    - **Fe + $CuSO_4$ -> FeSO4 + Cu**
  - Formation of Magnesium chloride and hydrogen
    - **Mg + 2HCL -> $MgCl_2$ + H_2**

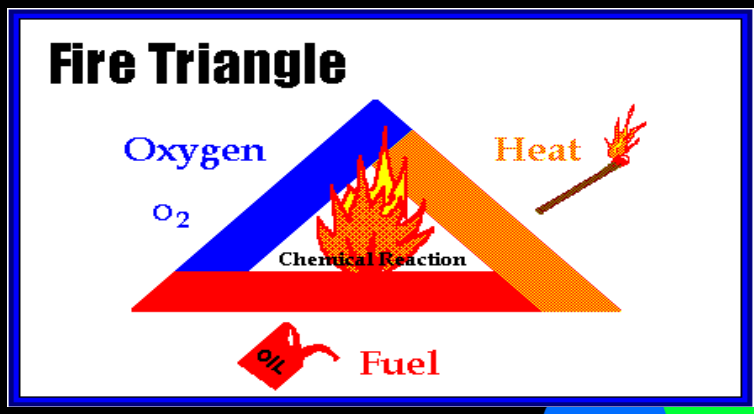
Double replacement reaction

- It's like exchanging the anions "non-metal like" parts of a compound

- It has the general formula
  - **AB + CD -> AD + CB**
- **EXAMPLES**
  - $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$
  - $K_2SO_4 + Ba(NO_3)_2 \rightarrow KNO_3 + BaSO_4$

COMBUSTION REACTIONS

- It occurs when hydrocarbon reacts with oxygen gas producing **CO_2** and **H_2O**
- It has the general formula
  - **C_XH_Y + ZO_2 -> ACO_2 + BH_2O**
    with you filling X,Y,Z,A,B by the required mole amounts to balance the equation
- **EXAMPLES**
  - **C_5H_{12} + $8O_2$ -> $5CO_2$ + $6H_2O$**



IDENTIFYING CHEMICAL REACTIONS

IF

- **Two elements became one ->** synthesis
- **one element became two ->** decomposition
- **element switched place with another in a compound ->** single replacement
- **compounds exchanged anions "non metal parts"** -> double replacement

1) $NaOH + KNO_3 \rightarrow NaNO_3 + KOH$ **DOUBLE DISPLACEMENT**
2) $CH_4 + 2\ O_2 \rightarrow CO_2 + 2\ H_2O$ **COMBUSTION**
3) $2\ Fe + 6\ NaBr \rightarrow$ No reaction
4) $CaSO_4 + Mg(OH)_2 \rightarrow Ca(OH)_2 + MgSO_4$
5) $Pb + O_2 \rightarrow PbO_2$ **SYNTHESIS**
6) $Na_2CO_3 \rightarrow Na_2O + CO_2$ **DECOMPOSITION**