



Types of Reactions

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- 5 main categories
- Helps us predict things about the reactions
 - Know the reactants? You can predict the products
 - Know the products? You can predict the reactants

Synthesis Reactions

Two things combining into one

Example:

- $X + Y \rightarrow XY$
- $O_2 + C \rightarrow CO_3$

What to look for:

- **Two (or more) Reactants**
- **One (or fewer) Products**

Decomposition Reactions

One thing falling apart into two

Example:

- $XY \rightarrow X + Y$
- $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

What to look for:

- One Reactant
- Two (or more) Products

The opposite of synthesis reactions

Combustion Reactions

Burning

Example:

- **Hydrocarbon + O₂ → CO₂ + H₂O**
- **CH₄ + 2O₂ → CO₂ + 2H₂O**

What to look for:

- Reactants = Hydrocarbon and O₂
- Products = CO₂ and H₂O

ALWAYS MAKE CO₂ and H₂O

Single Replacement Reactions

Example:

- $A + BC \rightarrow AC + B$
- $2\text{Al} + 3\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{Al}(\text{NO}_3)_3 + 3\text{Pb}$

What to look for:

- Reactants = 1 element and 1 compound
- Products = 1 element and 1 compound,
but different ones

***If element is a cation, replace it with the other cation.
If it is an anion, replace it with the other anion***

Double Replacement Reactions

Example:

- $AB + CD \rightarrow AD + CB$
- $AgNO_3 + KCl \rightarrow AgCl + KNO_3$

What to look for:

- Reactants = 2 Compounds
- Products = 2 Compounds but different ones

Switch everything!

Examples done on the board

- $\text{Zn} + 2\text{NaF} \rightarrow \text{ZnF}_2 + 2\text{Na}$
- $\text{Br}_2 + 2\text{KF} \rightarrow \text{F}_2 + 2\text{KBr}$
- $\text{CaF}_2 + 2\text{H}(\text{OH}) \rightarrow \text{Ca}(\text{OH})_2 + 2\text{HF}$