

Synthesis Reactions

• Two or more reactants combine to produce a new product.

 $2H_2(g) + O_2(g) \longrightarrow 2H_2O(\ell)$

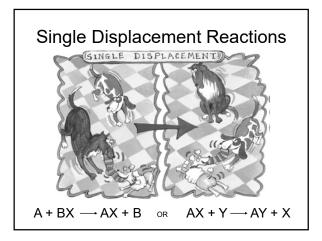
 $N_2(g) + O_2(g) \longrightarrow 2NO(g)$

 $Zn(s) + S(s) \longrightarrow ZnS(s)$

Decomposition Reactions

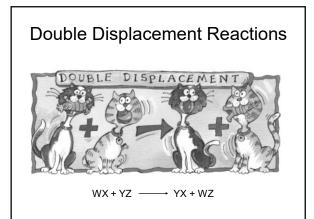
• A compound breaks down into two or more simpler compounds or elements.

 $H_2CO_3(aq) \longrightarrow CO_2(g) + H_2O(\ell)$





Single Replacement Reactions • One element takes the place of (displaces) another element in a compound. $2Na(s) + 2H_2O(\ell) \longrightarrow 2NaOH(aq) + H_2(g)$ $Mg(s)+2HCl(aq) \longrightarrow MgCl_2(aq) + H_2(g)$ $2AgNO_3(aq)+Cu(s) \longrightarrow Cu(NO_3)_2(aq) + 2Ag(s)$





• The cations of two different compounds exchange places, forming two new compounds.

 $Ba(OH)_2(aq) + Na_2SO_4(aq) \longrightarrow BaSO_4(s) + 2NaOH(aq)$

NaOH(aq) + HCl(aq) \longrightarrow NaCl(aq) +H₂O(ℓ)

Combustion Reaction

- Reaction that occurs when something burns.
- Shown by having oxygen, O₂, as one of the reactants.
- The products will **always** be carbon dioxide, CO₂ and water, H₂O

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