

# <u>Synthesis</u> is when two or more substances combine to form a *single* substance.

Example:  $A + B \rightarrow AB$ 



#### Synthesis reaction

# $2H_{2(g)} + O_{2(g)} \rightarrow H_2O_{(I)}$ Ask Yourself Are the reactants combining to form one product?

## Decomposition

# **Decomposition** reactions occur when

a single reactant is broken down.

 $AB \rightarrow A + B$ 



#### **Decomposition Reaction**

# $NaHCO_{3(s)} \rightarrow Na_{(s)} + CO_{2(g)} + H_2O_{(I)}$ Ask Yourself Is there one reactant forming more than one product?

# Single Replacement Reaction



$$+ \bigcirc \rightarrow \bigcirc + \bigcirc + \bigcirc + \bigcirc + BC$$

### Single Replacement Reaction

# $Zn_{(s)} + 2HCl_{(aq)} \rightarrow H_{2(g)} + ZnCl_{2(aq)}$ Ask Yourself Is there a single element replacing an element in a compound?

# **Double Replacement Reaction**





#### **Double Replacement Reaction**

# $KI_{(|)} + PbNO_{3(|)} \rightarrow PbI_{2(s)} + KNO_{3(|)}$ Ask Yourself Are elements in two reactants replacing each other in the products?

# **Reaction Types:**

<u>Combustion</u> reactions form carbon dioxide and water as products.

 $CH_4 + 2O_2 \rightarrow CO_2 + 2 H_2O_2$ 



#### **Combustion Reaction**

# $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

Yourself

# Are CO<sub>2</sub> and H<sub>2</sub>O products?