

# **Reactions & Chemical Changes**

# 5 Types of Chemical Reactions

- Synthesis
- Decomposition
- Single Displacement (Single Replacement)
- Double Displacement (Double Replacement)
- Combustion

# Synthesis



*Two or more substances combine to form a new one.*

video

# Decomposition



*One substance breaks down or decomposes into 2 or more simpler substances.*

Most reactions require heat, light or electricity.

video

# Single Displacement

(Single Replacement)

video



*One element replaces another in a compound. Metal replaces metal or nonmetal replaces nonmetal.*

# Double Displacement (Double Replacement)



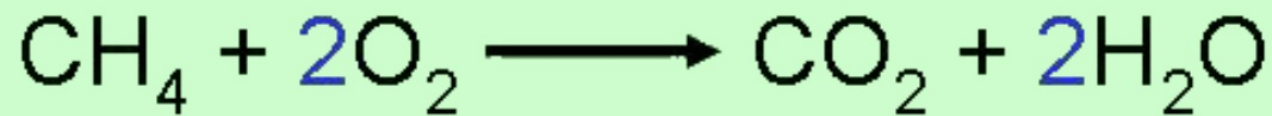
Usually forms a precipitate, water or a gas.

*The positive ion of one compound replaces the positive ion of the other compound to form 2 new compounds.*

video



# Combustion



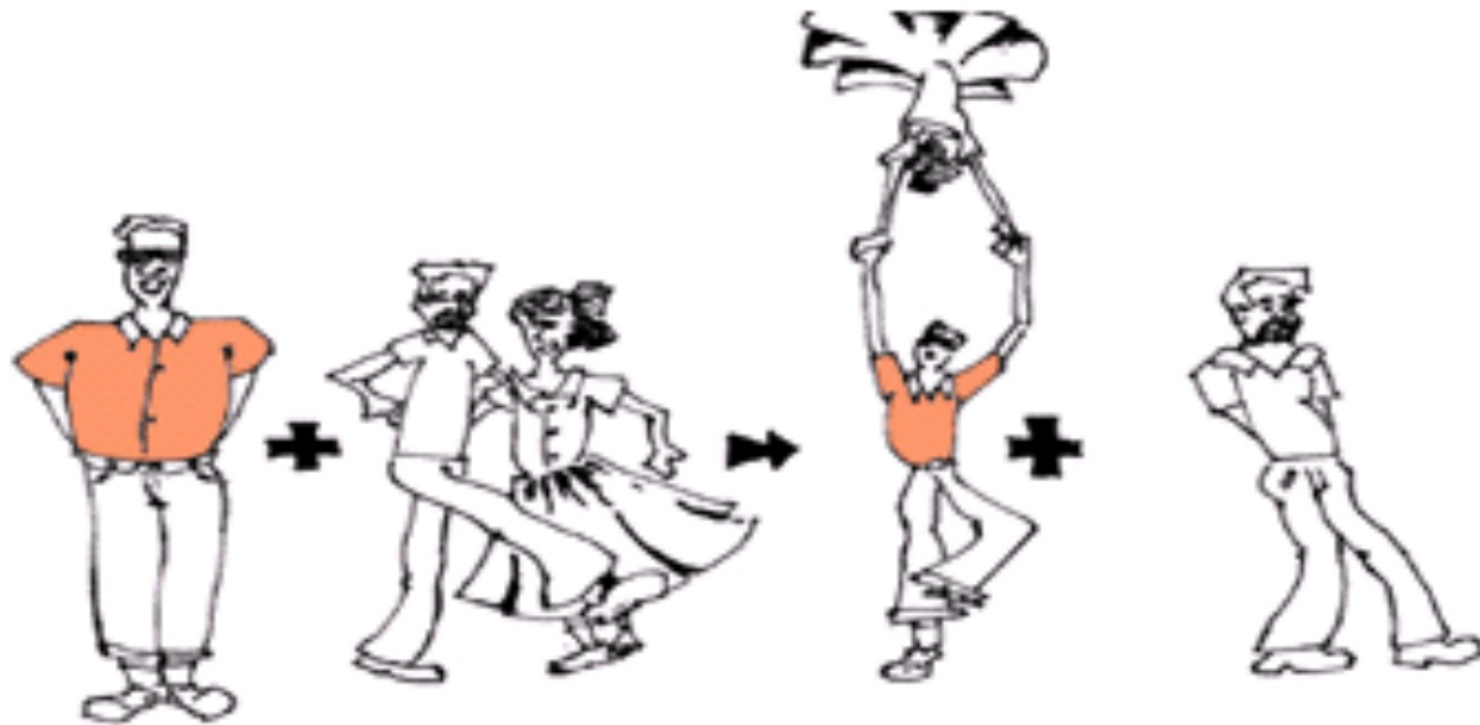
*Takes place when both  $\text{CO}_2$  and  $\text{H}_2\text{O}$  are the ONLY products. The only reactants are a hydro carbon ( $\text{C}_x\text{H}_y$ ) and oxygen ( $\text{O}_2$ )*

video

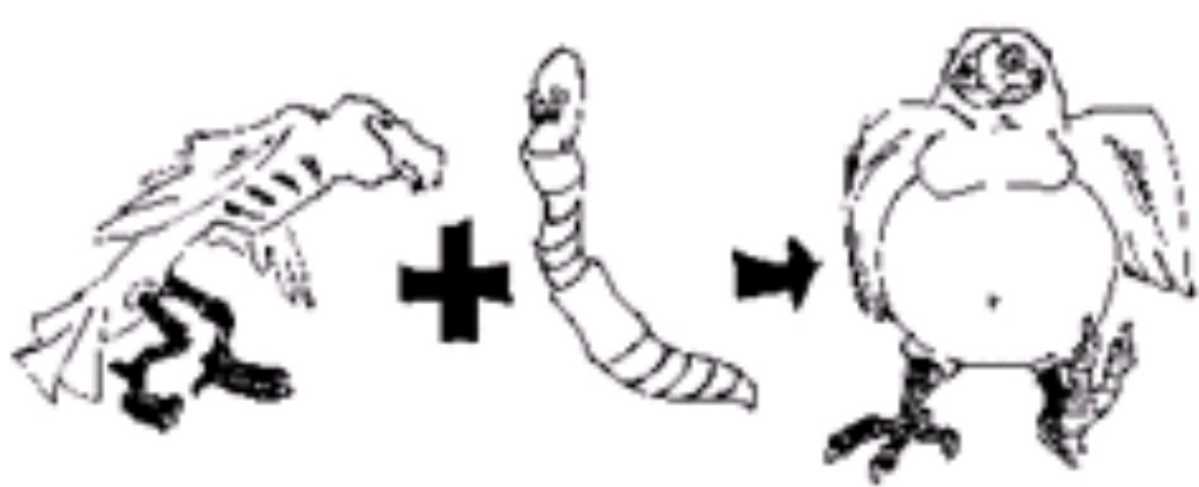


Decomposition

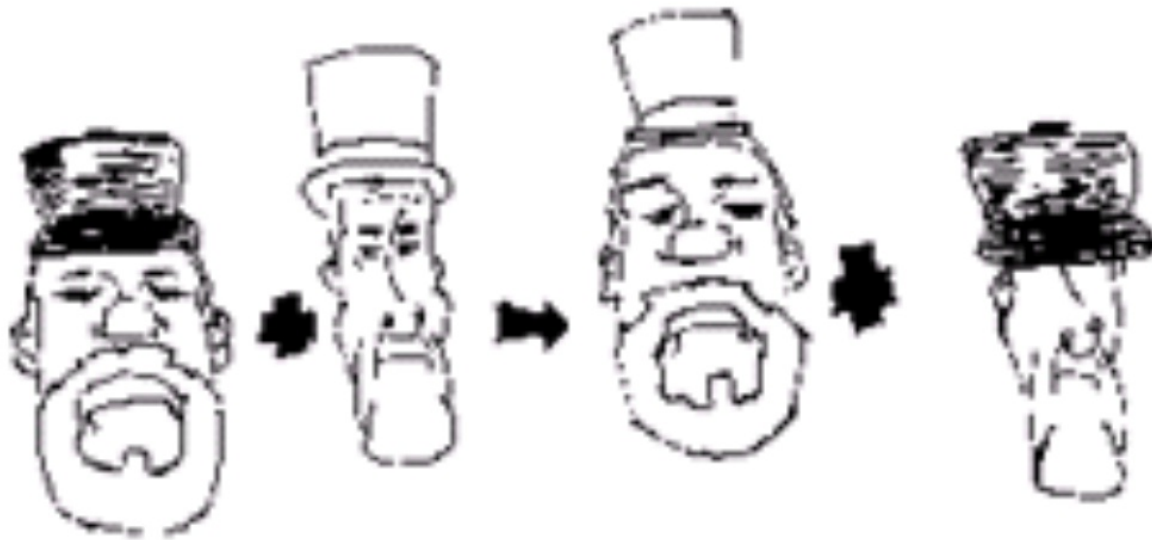




Single Displacement



Synthesis



Double Displacement

- 1)  $\text{Na}_3\text{PO}_4 + 3 \text{KOH} \rightarrow 3 \text{NaOH} + \text{K}_3\text{PO}_4$  double displacement
- 2)  $\text{MgCl}_2 + \text{Li}_2\text{CO}_3 \rightarrow \text{MgCO}_3 + 2 \text{LiCl}$  double displacement
- 3)  $\text{C}_6\text{H}_{12} + 9 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$  combustion
- 4)  $\text{Pb} + \text{FeSO}_4 \rightarrow \text{PbSO}_4 + \text{Fe}$  single displacement
- 5)  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$  decomposition
- 6)  $\text{P}_4 + 3 \text{O}_2 \rightarrow 2 \text{P}_2\text{O}_3$  synthesis

23. **Balance** the following equations and **classify** them one of the four kinds of chemical reactions:

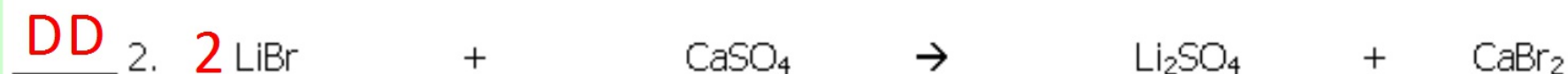
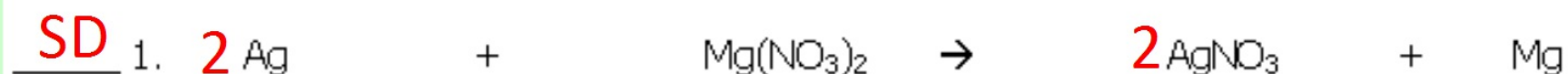
**S = Synthesis**

**SD = Single Displacement**

**D = Decomposition**

**DD = Double Displacement**

**C = Combustion**



# Energy in Reactions

- In a chemical reaction energy is either released or absorbed.
  - The energy can be
    - Heat
    - Light
    - Sound
    - Electricity

# Energy in Reactions

- Exothermic reactions

- Some form of energy is given off by the reaction
  - Heat given off causes reaction mixture to feel hot
  - Examples-burning wood, dynamite explosion

- Endothermic reactions

- Energy must be provided for the reaction to take place
  - Absorbs so much heat that the container feels cold
  - Example-frequently used to obtain a metal from its ore, using an electric current