

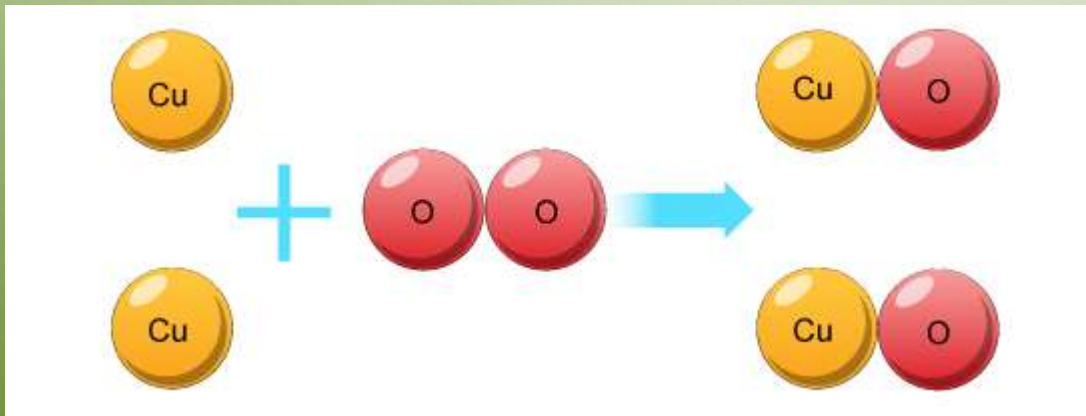
The background is a light green gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

CHEMICAL REACTIONS

CHAPTER 3

WHAT ARE CHEMICAL REACTIONS?

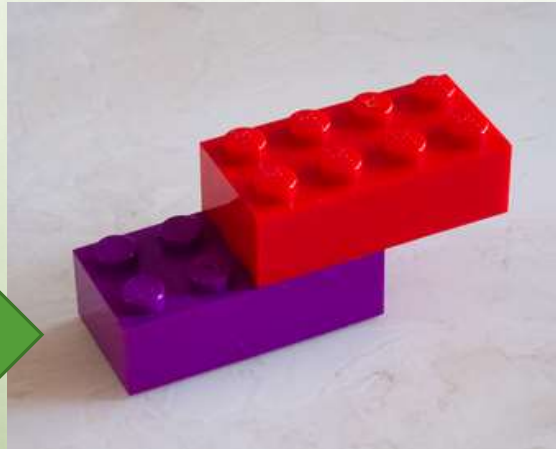
- A reaction that happens whenever **bonds** between atoms/molecules are **created** or **destroyed**



FOUR TYPES OF CHEMICAL REACTIONS

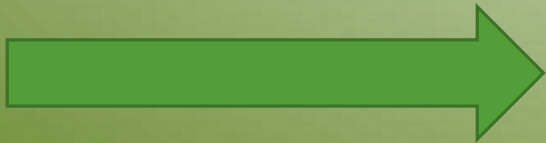
COMBINATION

Two molecules combine

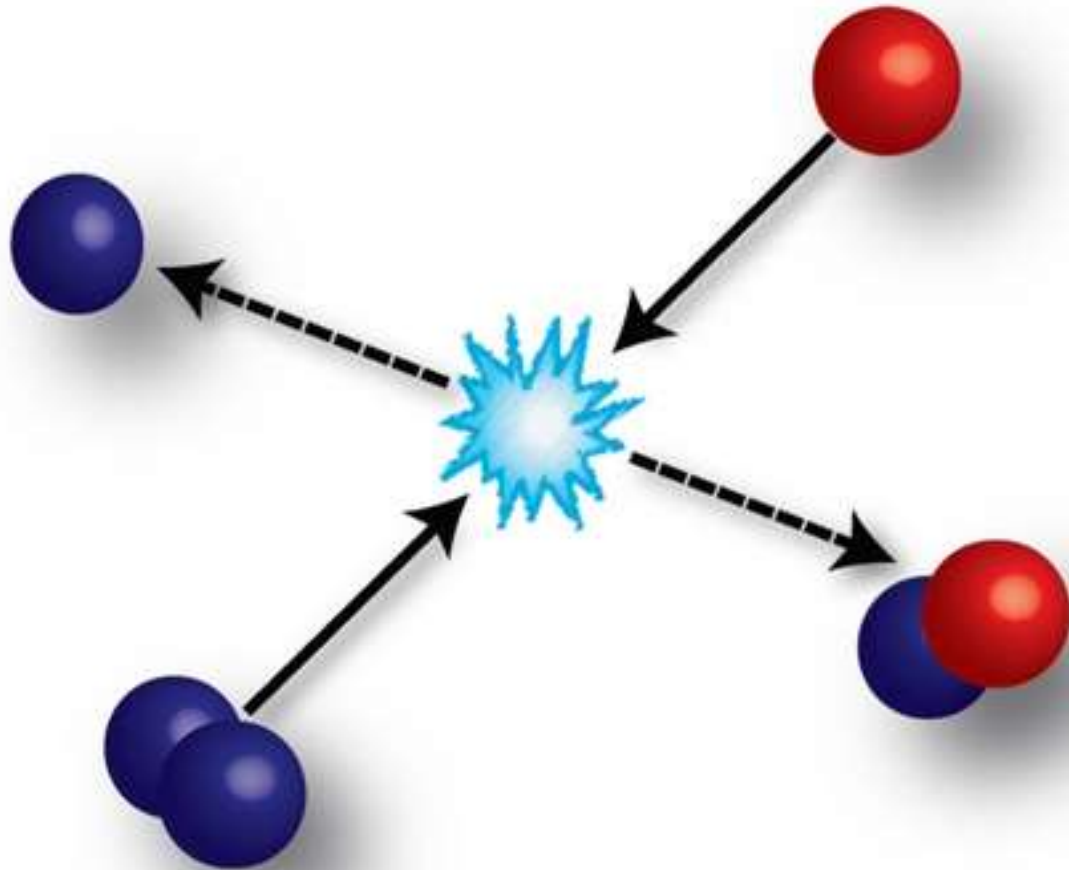


DECOMPOSITION

Molecules break apart



FOUR TYPES OF CHEMICAL REACTIONS



DISPLACEMENT

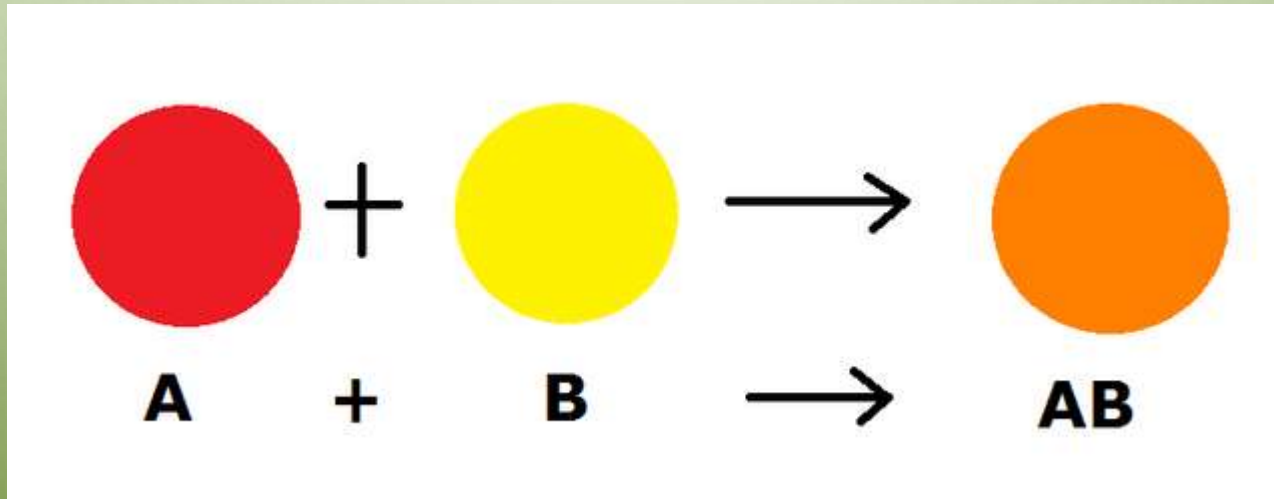
One atom kicks another out of a molecule

EXCHANGE

One atom trades places with another atom

COMBINATION REACTION

- Two or more atoms combine to make something new
- $A + B \rightarrow AB$
- Ex. NaCl





Sodium metal



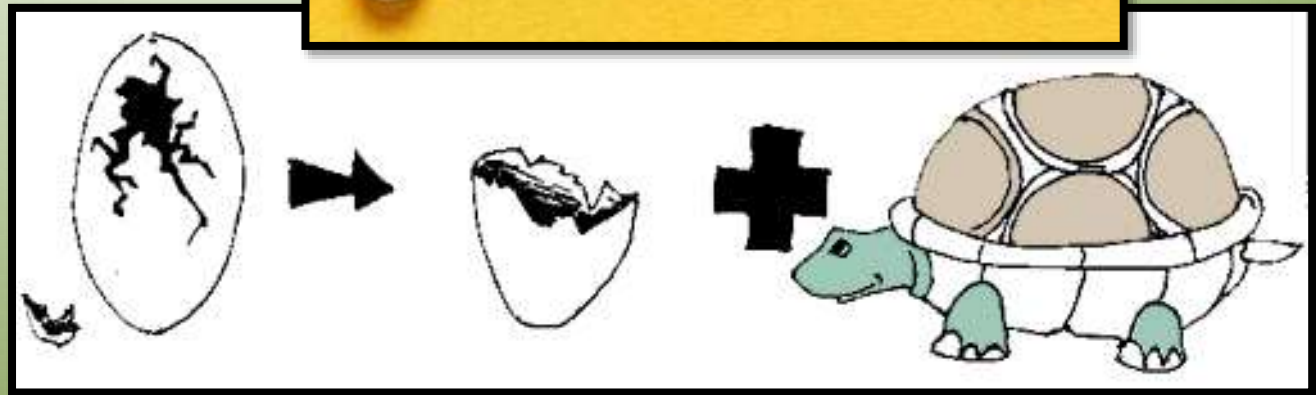
Chlorine gas



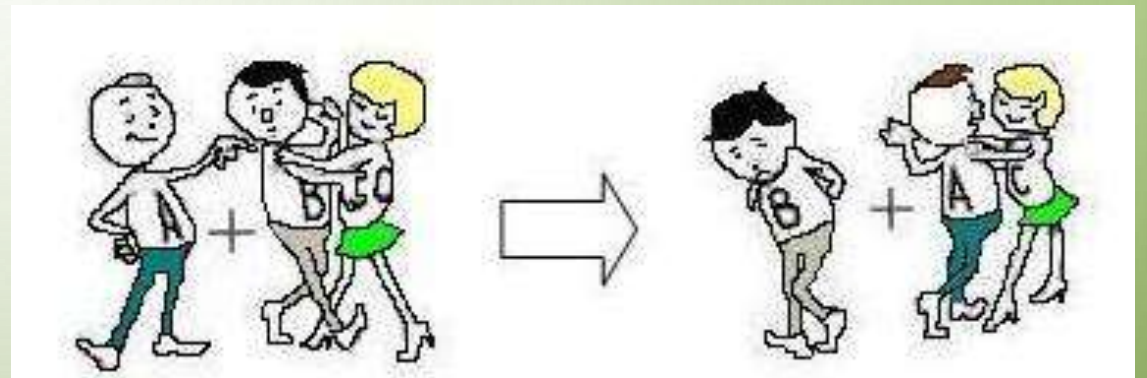
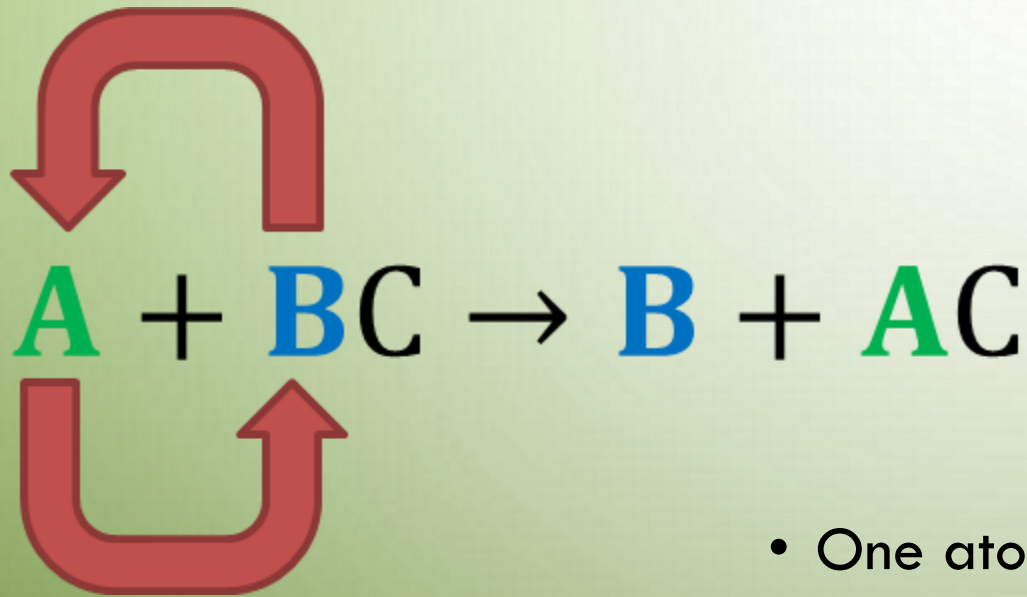
Sodium chloride

DECOMPOSITION REACTION

- $AB \rightarrow A + B$
- Molecules break apart... decompose
- Make two or more products
- Ex. $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$



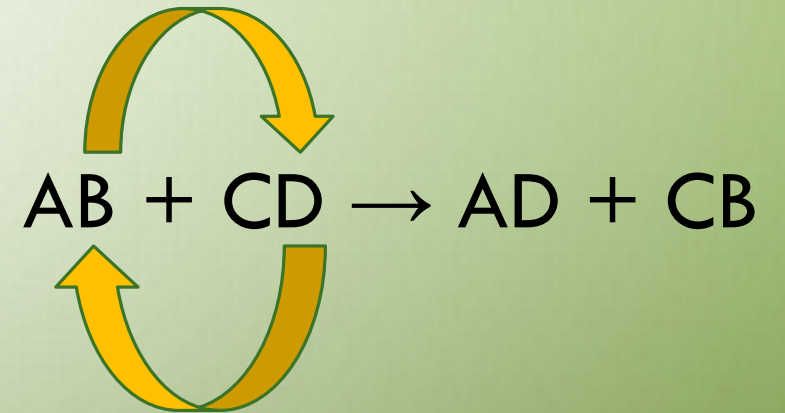
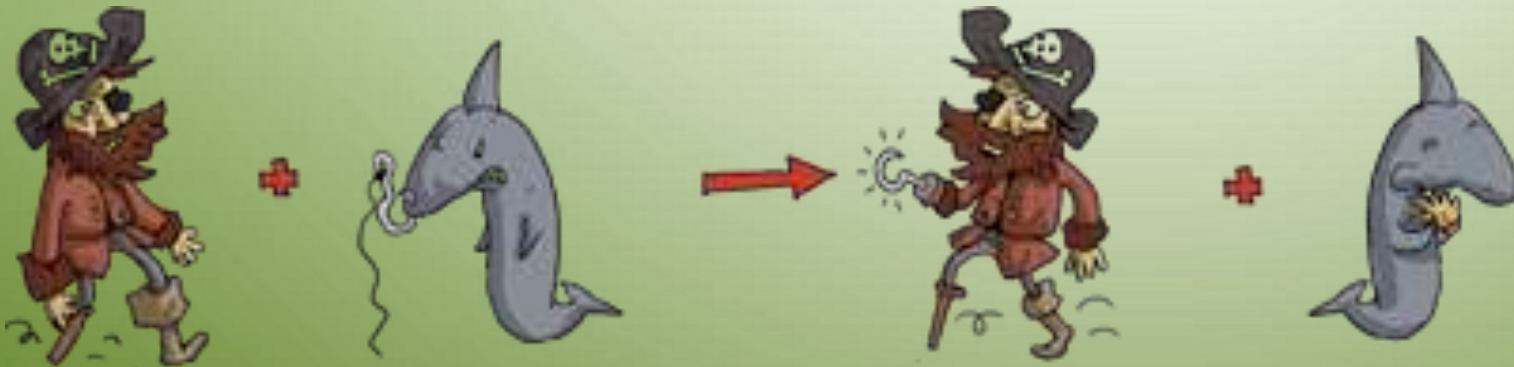
DISPLACEMENT REACTION



- One atom kicks another one out...
- The kicker combines with the current molecule
- The kicked out atom goes and does something else

EXCHANGE REACTION

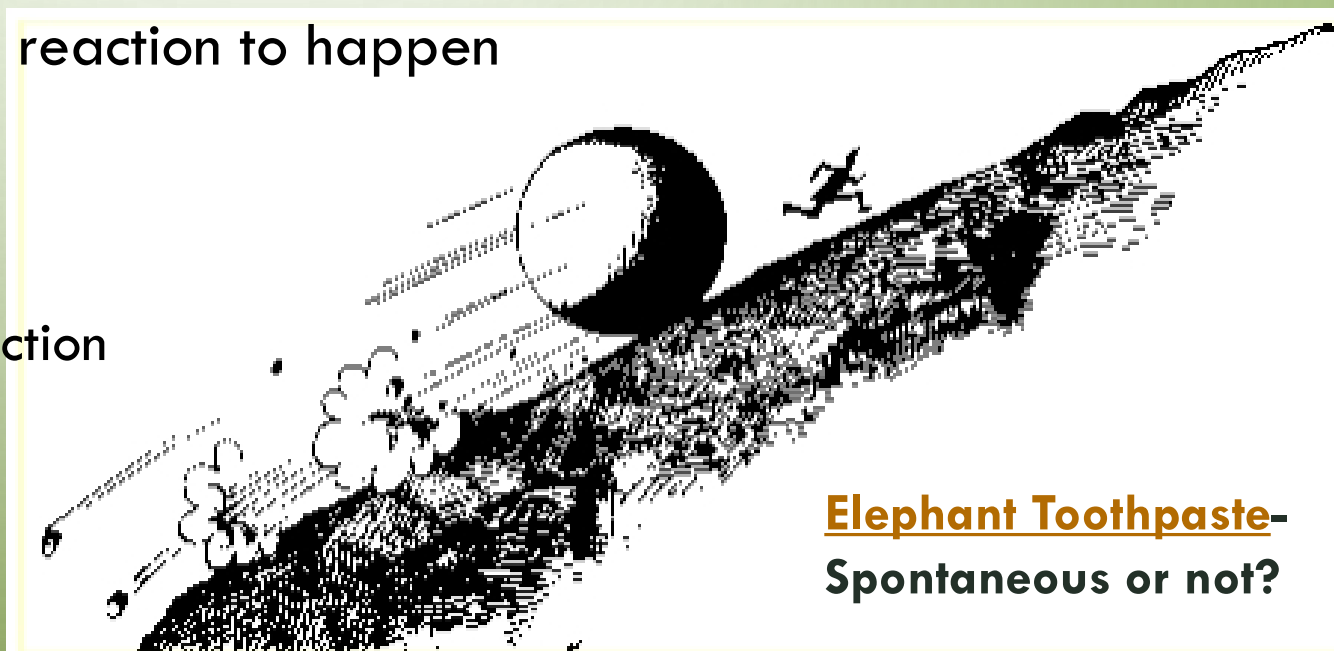
- Atoms trade places to make two new molecules



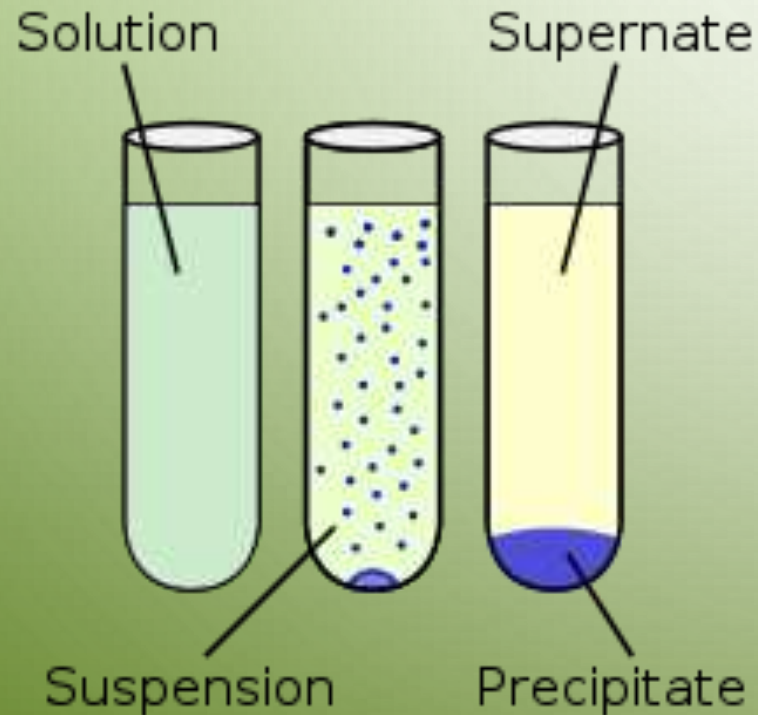


SPONTANEOUS OR NOT?

- **Spontaneous-** happens by itself, just by mixing the chemicals
- Some need extra help for the reaction to happen
 - Heat
 - Electricity
 - **Catalyst-** speeds up the reaction



EVIDENCE OF A REACTION



- BUBBLES- gas was formed
- Color change- new solution
- Temperature change- hot or cold
- **Precipitate**- new molecules don't dissolve in the solution
 - looks like sand/dust/snow/mud