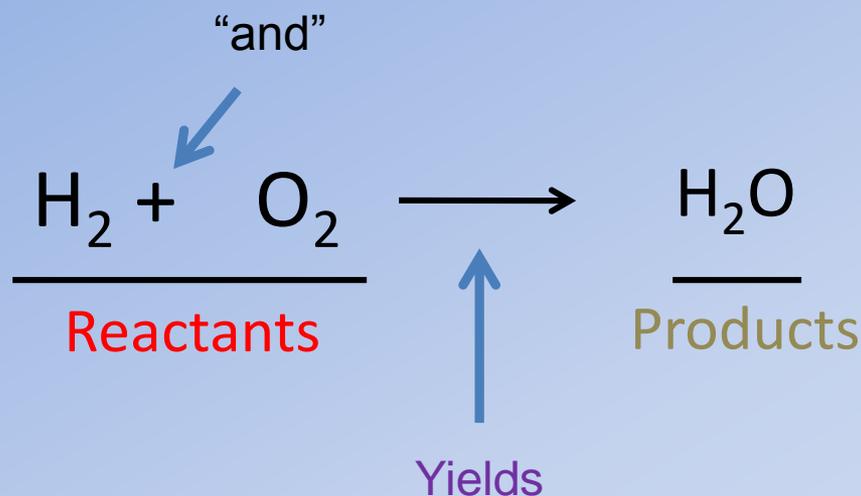


# BALANCING CHEMICAL EQUATIONS

# Parts of a chemical reaction

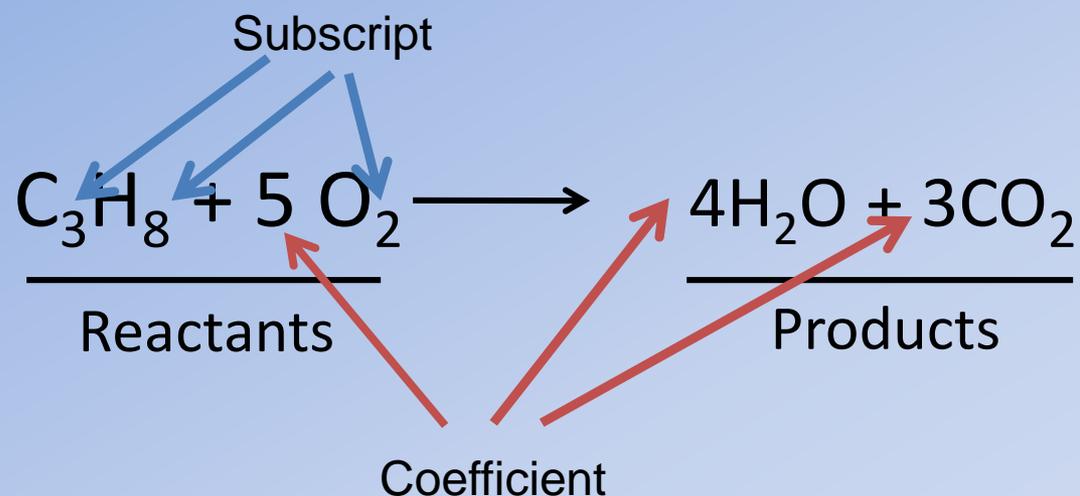


- **Reactants** are the elements or compounds that start a chemical reaction. Always found at the tail of the Yields Arrow.
- **Yields Arrow** – This indicates that a chemical reaction takes place and the atoms of the reactants rearrange into the products.
- **Products** are the elements or compounds that are the result (product) of a chemical reaction. Products are always found at the point of the Yields Arrow.

# Parts of a chemical reaction

- **Reactants** are the elements or compounds that start a chemical reaction. Always found at the tail of the Yields Arrow.
- **Yields Arrow** – This indicates that a chemical reaction takes place and the atoms of the reactants rearrange into the products.
- **Products** are the elements or compounds that are the result (product) of a chemical reaction. Products are always found at the point of the Yields Arrow.

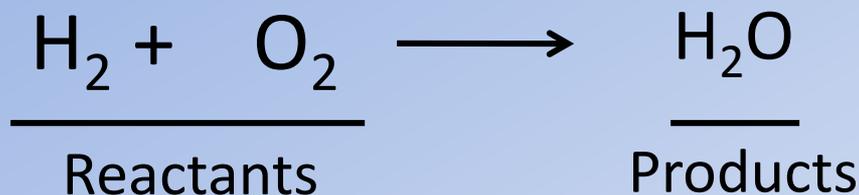
# Parts of a chemical reaction



- **Subscripts** apply only to the atom they are attached to. This number tells you how many of that atom are in the molecule.
- **Coefficients** are the number in front of a molecule or element in a chemical equation. Coefficients indicate how many of those molecules there are.

# Parts of a chemical reaction

What needs to be changed to make this a balanced reaction?



- Chemical reactions must have the same number of atoms in the reactants side as the products side.
- Conservation of mass
  - The total mass of materials in nature remains constant
- When a chemical reaction has mass conserved, it is considered balanced.

# There are three types of chemical reactions

## 1. Synthesis Reaction

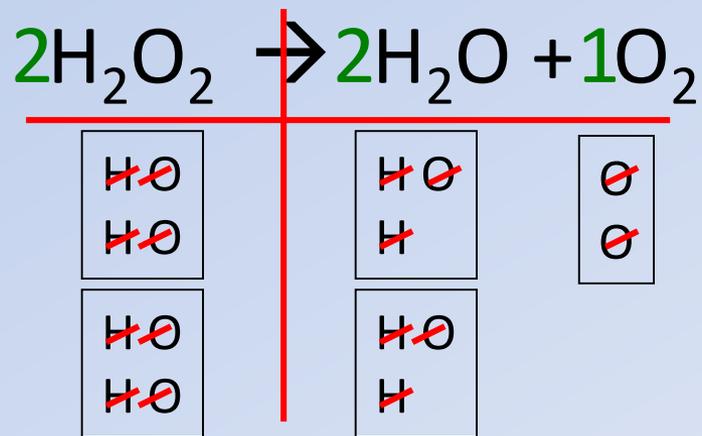
A. Two simple molecules form a more complex molecule.

i. Example:  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

## 2. Decomposition Reaction

A. One complex compound is broken into simpler compounds.

i. Example:  $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$



# There are three types of chemical reactions

## 1. Synthesis Reaction

A. Two simple compounds form one, more complex compound.

i. Example:  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$

## 2. Decomposition Reaction

A. One complex compound is broken into simpler compounds.

i. Example:  $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$

## 3. Replacement Reaction

A. Ions in two compounds are switched during a reaction.

i. Example:  $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$