

How to Balance Chemical Equations

1. Chemical reactions

Chemical reactions are like a '_____'. The people starting the dance are called **reactants**. The number of people on the dance floor remains the same. During the dance people change partners and form new groups called **products**. This is what happens in a chemical reaction. Atoms swap with one another and produce new chemicals.

Old chemicals(_____) rearrange to produce new chemicals(_____)

Reactants Products

The arrow means '_____'

In a chemical reaction atoms are rearranged as old chemical bonds are broken and new chemical bonds are formed. The 'law of conservation of _____' is supported as the weight doesn't change between the mass of the reactants and the mass of the products.

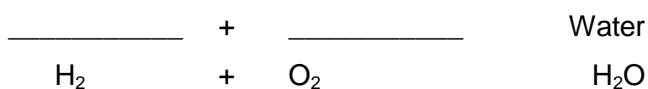
2. How to balance a chemical equation

In balancing chemical equations you need to remember to **three** important points.

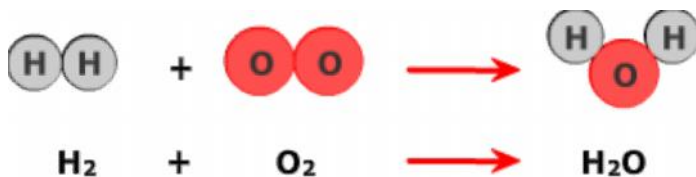
- You do not change the **chemical** _____ of a substance to balance an equation.
- An equation is balanced by writing _____ **numbers** before a chemical symbol or formula.
- The _____ and _____ of atoms must **balance** on both sides of the chemical equation.

3. Example of how to balance a chemical equation

a) Write a balanced chemical equation of hydrogen combining with oxygen to produce water.



The **type** and **number** of atoms must be the same on both sides of the equation.



b) Check the number of atoms for each element.

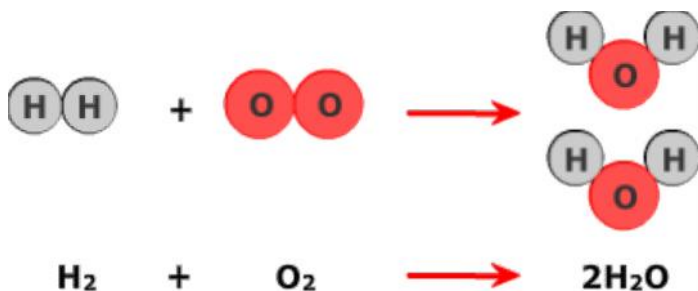
| Element | Reactants | Products |
|---------|-----------|----------|
| H | | |
| O | | |

An oxygen atom cannot disappear in the reaction.



c) A helpful hint is to look for an odd number of elements in the product side of the reaction and _____ it

The oxygen in H₂O is an odd number so it is doubled. H₂ + O₂ → 2H₂O

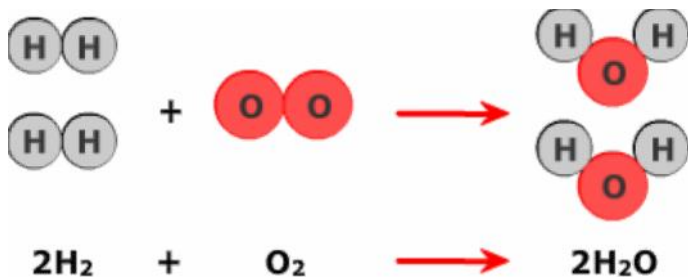


d) Check the number of atoms for each element.

| Element | Reactants | Products |
|---------|-----------|----------|
| H | | |
| O | | |

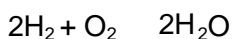
The oxygen is now balanced however, now we don't have enough hydrogen atoms.

Since the hydrogen atoms come in pairs we need ____ pairs to make 4.



e) Check the number of atoms for each element.

| Element | Reactants | Products |
|---------|-----------|----------|
| H | | |
| O | | |



The chemical equation is now _____

How to Balance Chemical Equations - ANSWERS

1. Chemical reactions

Chemical reactions are like a 'dance'. The people starting the dance are called **reactants**. The number of people on the dance floor remains the same. During the dance people change partners and form new groups called **products**. This is what happens in a chemical reaction. Atoms swap with one another and produce new chemicals.

Old chemicals(reactants) rearrange to produce new chemicals(products)

Reactants Products

The arrow means 'produces'

In a chemical reaction atoms are rearranged as old chemical bonds are broken and new chemical bonds are formed. The 'law of conservation of mass' is supported as the weight doesn't change between the mass of the reactants and the mass of the products.

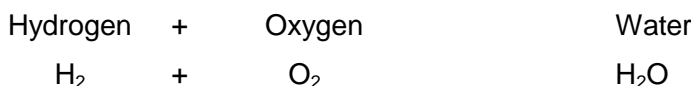
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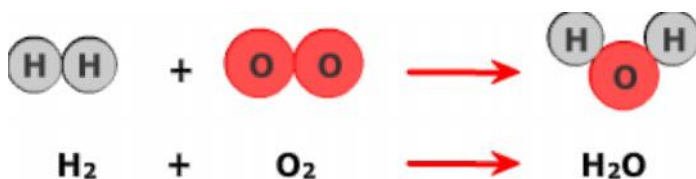
- You do not change the **chemical formula** of a substance to balance an equation.
- An equation is balanced by writing **whole numbers** before a chemical symbol or formula.
- The **type** and **number** of atoms must **balance** on both sides of the chemical equation.

3. Example of how to balance a chemical equation

a) Write a balanced chemical equation of hydrogen combining with oxygen to produce water.



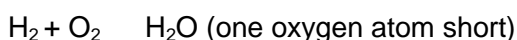
The type and number of atoms must be the same on both sides of the equation.



b) Check the number of atoms for each element.

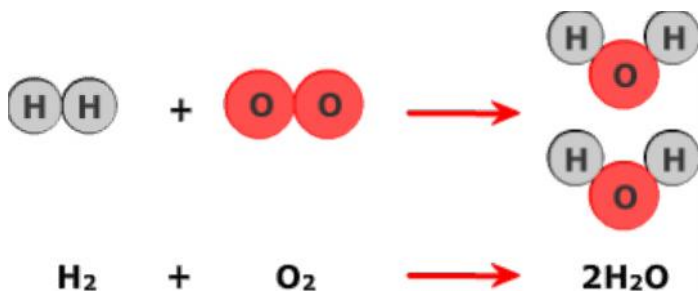
| Element | Reactants | Products |
|----------|-----------|----------|
| H | 2 | 2 |
| O | 2 | 1 |

An oxygen atom cannot disappear in the reaction.



c) A helpful hint is to look for an odd number of elements in the product side of the reaction and double it

The oxygen in H₂O is an odd number so it is **doubled**. H₂ + O₂ → 2H₂O

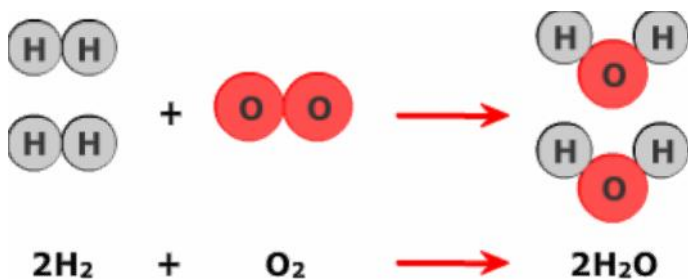


d) Check the number of atoms for each element.

| Element | Reactants | Products |
|---------|-----------|----------|
| H | 2 | 4 |
| O | 2 | 2 |

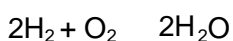
The oxygen is now balanced however, now we don't have enough hydrogen atoms.

Since the hydrogen atoms come in pairs we need 2 pairs to make 4.



e) Check the number of atoms for each element.

| Element | Reactants | Products |
|---------|-----------|----------|
| H | 4 | 4 |
| O | 2 | 2 |



The chemical equation is now balanced!