



Balancing Chemical Equations

The purpose of balancing chemical equations is to make sure the same number of each element exists as reactants and products. Think of it as people entering and leaving a party. The same number of people should enter the party as leave the party, but over the course of the party, they might change partners.

Suggestions for Balancing Chemical Equations:

- List the number of each element on the reactant side and on the product side
- Change the coefficients (the numbers in front of the chemical formula)

Parts of a Chemical Equation:

- $\text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$
 - The blue numbers that are the same size as the letters are coefficients. These tell you how many of that group there are. If there is no number, it is an assumed one.
 - The combination of the Letters and the subscript numbers are the chemical formulas. It shows how the elements are arranged. These elements are bonded together.

Example:

- For the formation of ammonia, the chemical equation is $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
 - This equation shows two nitrogens entering the party together and two hydrogens entering the party together.
- But only one nitrogen leaves the party, and it leaves with three hydrogens! These numbers don't make sense.
- The balanced form of this equation is $\text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$
 - Here we see a total of 2 nitrogens (1 grouping of 2) and 6 hydrogens (3 groupings of 2) entering and the same number leaving (2 of a group containing 1 nitrogen and 3 hydrogen).

For more information on balancing chemical equations, make an appointment with a [content tutor](#). Appointments are available in person at the [Student Success Center](#) or online.