

## Rules for Balancing Chemical Equations

When you balance a chemical equation you are writing the equation in a form that will help you determine how much product will be made from a given amount of a reactant, or how much of a reactant is needed to create a given amount of product. This is useful information. To get this information you use the fact that in a chemical equation you are not creating or destroying any atoms of any elements; the number of each type of atom on one side must equal the number of atoms of that type of element on the other side.\*

Here are some basic steps that help when you balance chemical equations.

1. Leave any type of atoms that are present in their elemental state alone until the end. This is particularly true if one of the elements is written as a single atom. (For example Na)
2. Start by balancing an element that appears in only one reactant and one product. This ratio is fixed, and can't change when you change the coefficients.
3. Once these are balanced go to the most complicated looking compound. (Hopefully you have already taken care of this compound in the previous step.)
4. Adjust the amount of polyatomic elements (such as  $S_5$  or  $O_2$ )
5. Adjust the amount of any element that appears as a single atom.

Keep in mind that you cannot change the compounds and elements that are reacting. This means all of the subscripts must remain unchanged.

\*This is meant to help when you are practicing balancing chemical equations. For background information, or to check vocabulary you are unsure of, check the lecture slides.