

Tutorial – Counting Atoms in Molecules

The first skill required to be able to balance chemical equations is counting atoms in molecules. The following 3 rules and the examples will help you connect on how this counting system works.

1. Coefficients multiply each atom in the molecule

Examples:

3 KCl	3 K 3 Cl
2 MnO	2 Mn 2 O
7 KOH	7 K 7 O 7 H

2. If an atom has a subscript the coefficient multiplies every atom's subscript

Examples:

3 H ₂ O ₂	6 H 6 O
3 K ₂ CrO ₄	6 K 3 Cr 12 O
4 K ₂ SO ₄	8 K 4 S 16 O

3. If there is a subscript after a parenthesis, it multiplies everything inside the parentheses, but not anything in the molecule outside of the parenthesis

Examples:

5 Fe ₃ (SO ₄) ₂	15 Fe 10 S 40 O
3 Mn(SO ₄) ₂	3 Mn 6 S 24 O
3 Cu(ClO ₃) ₂	3 Cu 6 Cl 18 O