

Model Reaction

How are the coefficients in a chemical equation determined?

Why?

A balanced chemical equation can tell us the number of reactant and product particles (atoms, molecules or formula units) that are necessary to conserve mass during a chemical reaction. Typically, when we balance the chemical equation we think in terms of individual particles. However, it can be the reaction represented by an equation occurs on a macroscopic number of atoms. When all writing very large numbers (10²³ or larger) in front of each chemical in the equation, how can we compare balanced equations, or how they more realistically represent what is happening in reality? In the activity you will explore the different ways a chemical reaction can be represented.

Model 1 – A Chemical Reaction



1. Consider the reaction in Model 1.
 - a. What are the coefficients for each of the following substances in the reaction?



- b. Draw particle models below to illustrate the reaction in Model 1.

2. Consider each reaction below as a version of the reaction in Model 1.
 - a. Calculate the masses of reactants consumed and products made.
 - b. Record the ratio of H_2 to O_2 to H_2O . Relate the ratios to the mass ratio number-particle.

	H_2 Consumed	O_2 Consumed	H_2O Produced	Ratio: H_2 : O_2 : H_2O (mass)
For a single reaction, how many particles of each substance would be consumed or produced?				
If the reaction occurred on the atomic scale, how many molecules would be consumed or produced?				
If the reaction occurred on the molar scale, how many molecules would be consumed or produced?				