## Mole Ratios

How can the coefficients in a chemical equation be interpreted?

# Why?

A balanced chemical equation can tell us the number of reactant and product particles (ions, 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, in real life the reaction represented by an equation occurs an unimaginable number of times. Short of writing very large numbers (10% or larger) in front of each chemical in the equation, how can we interpret chemical equations so that they more realistically represent what is happening in real life? In this activity you will explore the different ways a chemical reaction can be interpreted.

## Model 1 – A Chemical Reaction

$$N_3(g) + 3H_3(g) \rightarrow 2NH_3(g)$$

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

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



- 2. Consider each situation below as it relates to the reaction in Model 1.
  - a. Calculate the amount of reactants consumed and products made.
  - 6. Record the ratio of N2 to H2 to NH3. Reduce the ratio to the lowest whole numbers possible.

	N <sub>2</sub> Consumed	H <sub>2</sub> Consumed	NH, Produced	Ratio N <sub>3</sub> :H <sub>2</sub> :NH <sub>3</sub> (reduced)
For a single reaction, how many molecules of each substance would be consumed or produced?	1 molecule	3 molecules	2 molecules	1:3:2
If the reaction occurred one hun- dred times, how many molecules would be consumed or produced?	100 molecules	300 molecules	200 molecules	1:3:2
If the reaction occurred 538 times, how many molecules would be consumed or produced?	538 molecules	1614 molecules	1076 molecules	1:3:2

# **Mole Rations Pogil**

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#### **Mole Rations Pogil:**

Mole Ratios Lifelige, 2019 This lesson plan relates balanced chemical equations to everyday analogies defines stoichiometry and uses mole ratios to convert between amounts of substances in chemical reactions Chemistry Education in the ICT Age Minu Gupta Bhowon, Sabina Jhaumeer-Laulloo, Henri Li Kam Wah, Ponnadurai Ramasami, 2009-07-21 th th The 20 International Conference on Chemical Education 20 ICCE which had rd th Chemistry in the ICT Age as the theme was held from 3 to 8 August 2008 at Le M ridien Hotel Pointe aux Piments in Mauritius With more than 200 participants from 40 countries the conference featured 140 oral and 50 poster presentations th Participants of the 20 ICCE were invited to submit full papers and the latter were subjected to peer review The selected accepted papers are collected in this book of proceedings This book of proceedings encloses 39 presentations covering topics ranging from fundamental to applied chemistry such as Arts and Chemistry Education Biochemistry and Biotechnology Chemical Education for Development Chemistry at Secondary Level Chemistry at Tertiary Level Chemistry Teacher Education Chemistry and Society Chemistry Olympiad Context Oriented Chemistry ICT and Chemistry Education Green Chemistry Micro Scale Chemistry Modern Technologies in Chemistry Education Network for Chemistry and Chemical Engineering Education Public Understanding of Chemistry Research in Chemistry Education and Science Education at Elementary Level We would like to thank those who submitted the full papers and the reviewers for their timely help in assessing the papers for publication th We would also like to pay a special tribute to all the sponsors of the 20 ICCE and in particular the Tertiary Education Commission http tec intnet mu and the Organisation for the Prohibition of Chemical Weapons http www opcw org for kindly agreeing to fund the publication of these proceedings **Stoichiometric Calculations** Lifelige, 2019 This lesson plan covers how to calculate moles and volume ratios for balanced chemical equations

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