

Student Exploration: Chemical Equations

Vocabulary: Avogadro's number, chemical equation, chemical formula, chemical reaction, coefficient, combination, combustion, conservation of matter, decomposition, double replacement, molar mass, mole, molecular mass, molecule, product, reactant, single replacement, subscript

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. A candle is placed on one pan of a balance, and an equal weight is placed on the other pan.

What would happen if you lit up the candle and waited for a while? **The pan with the candle on it will be lifted.**

2. Suppose the candle was placed in a large, sealed jar that allowed it to burn for several minutes before running out of oxygen. The candle and jar are balanced by an equal weight.

In this situation, what would happen if you lit up the candle and waited? **The side with the lit candle would rise because the energy from the burning flame would be concealed in the top of the jar making it lighter.**

Gizmo Warm-up

Burning is an example of a **chemical reaction**. The law of **conservation of matter** states that no atoms are created or destroyed in a chemical reaction. Therefore, a balanced **chemical equation** will show the same number of each type of atom on each side of the equation.

To set up an equation in the *Chemical Equations* Gizmo, type the **chemical formulas** into the text boxes of the Gizmo. First, type in "H₂+O₂" in the **Reactants** box and "H₂O" in the **Products** box. This represents the reaction of hydrogen and oxygen gas to form water.



1. Check that the **Visual** display is chosen on each side of the Gizmo, and count the atoms.

A. How many hydrogen atoms are on the **Reactants** side? **2** **Products** side? **2**

B. How many oxygen atoms are on the **Reactants** side? **2** **Products** side? **1**

2. Based on what you see, is this equation currently balanced?
No.

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**United States. Congress. House.
Committee on Science, Space, and
Technology (2011). Subcommittee on
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Table of Contents Explore Learning Solar System Answer Key

1. Understanding the eBook Explore Learning Solar System Answer Key
 - The Rise of Digital Reading Explore Learning Solar System Answer Key
 - Advantages of eBooks Over Traditional Books
2. Identifying Explore Learning Solar System Answer Key
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Explore Learning Solar System Answer Key
 - User-Friendly Interface
4. Exploring eBook Recommendations from Explore Learning Solar System Answer Key
 - Personalized Recommendations
 - Explore Learning Solar System Answer Key User Reviews and Ratings
 - Explore Learning Solar System Answer Key and Bestseller Lists
5. Accessing Explore Learning Solar System Answer Key Free and Paid eBooks

- Explore Learning Solar System Answer Key Public Domain eBooks
- Explore Learning Solar System Answer Key eBook Subscription Services
- Explore Learning Solar System Answer Key Budget-Friendly Options
- 6. Navigating Explore Learning Solar System Answer Key eBook Formats
 - ePub, PDF, MOBI, and More
 - Explore Learning Solar System Answer Key Compatibility with Devices
 - Explore Learning Solar System Answer Key Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Explore Learning Solar System Answer Key
 - Highlighting and Note-Taking Explore Learning Solar System Answer Key
 - Interactive Elements Explore Learning Solar System Answer Key
- 8. Staying Engaged with Explore Learning Solar System Answer Key
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Explore Learning Solar System Answer Key
- 9. Balancing eBooks and Physical Books Explore Learning Solar System Answer Key
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Explore Learning Solar System Answer Key
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Explore Learning Solar System Answer Key
 - Setting Reading Goals Explore Learning Solar System Answer Key
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Explore Learning Solar System Answer Key
 - Fact-Checking eBook Content of Explore Learning Solar System Answer Key
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development

- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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