

Teacher Guide: Element Builder



Learning Objectives

Students will...

- Compare the sizes, charges, and relative positions of the subatomic particles: protons, neutrons, and electrons.
- Relate an atom's number of protons to its charge, name, and atomic number.
- Calculate the mass number of an atom by summing the protons and neutrons.
- Understand the definition of isotope.
- Observe how electrons fill the first three energy levels.
- Create an electron dot diagram for each of the first 20 elements.



Vocabulary

atom, atomic number, electron, electron dot diagram, element, energy level, ion, isotope, mass number, neutron, nucleus, periodic table, proton, radioactive, valence electrons

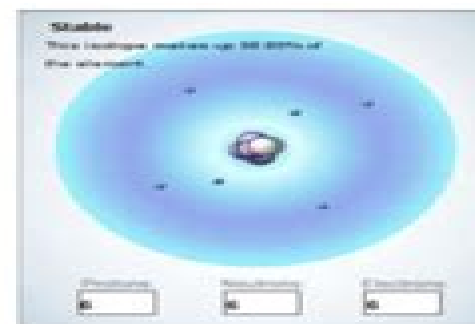


Lesson Overview

The *Element Builder Gizmo™* allows students to construct atoms by adding protons, neutrons, and electrons. As they add particles, students can see the atomic number, mass number, charge, and electron dot diagram of the element.

The Student Exploration sheet contains two activities and an Extension:

- Activity A – Students determine the mass number and atomic number of an atom.
- Activity B – Students observe electron arrangements and create electron dot diagrams.
- Extension – Students see how valence electrons relate to the periodic table of elements.



Model of a carbon atom



Suggested Lesson Sequence

1. Pre-Gizmo activity

(📅 1 – 2 weeks)

Atoms are too tiny to see, yet much about their structure had been deduced by the early part of the twentieth century. The development of atomic theory is one of the central narratives of physics and well worth learning more about.

Divide the class into groups and assign to each group one of the critical scientists involved in atomic theory. These could include Democritus, John Dalton, Dmitri Mendeleev, J.J. Thomson, Robert Millikan, Ernest Rutherford, Marie Curie, James Chadwick, Niels Bohr, Enrico Fermi, and others (see **Selected Web Resources**).

After researching their scientist via the Internet, students can present their findings with posters, atom models, and even reenactments of famous experiments.

Element Builder Gizmo Teachers Guide

Guillaume Favre

A red circular graphic with a gradient, appearing as a partial circle or a thick arc, located to the right of the author's name.

Element Builder Gizmo Teachers Guide:

The book delves into Element Builder Gizmo Teachers Guide. Element Builder Gizmo Teachers Guide is an essential topic that must be grasped by everyone, ranging from students and scholars to the general public. This book will furnish comprehensive and in-depth insights into Element Builder Gizmo Teachers Guide, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
 - Chapter 1: Introduction to Element Builder Gizmo Teachers Guide
 - Chapter 2: Essential Elements of Element Builder Gizmo Teachers Guide
 - Chapter 3: Element Builder Gizmo Teachers Guide in Everyday Life
 - Chapter 4: Element Builder Gizmo Teachers Guide in Specific Contexts
 - Chapter 5: Conclusion
2. In chapter 1, the author will provide an overview of Element Builder Gizmo Teachers Guide. This chapter will explore what Element Builder Gizmo Teachers Guide is, why Element Builder Gizmo Teachers Guide is vital, and how to effectively learn about Element Builder Gizmo Teachers Guide.
3. In chapter 2, this book will delve into the foundational concepts of Element Builder Gizmo Teachers Guide. This chapter will elucidate the essential principles that must be understood to grasp Element Builder Gizmo Teachers Guide in its entirety.
4. In chapter 3, the author will examine the practical applications of Element Builder Gizmo Teachers Guide in daily life. The third chapter will showcase real-world examples of how Element Builder Gizmo Teachers Guide can be effectively utilized in everyday scenarios.
5. In chapter 4, this book will scrutinize the relevance of Element Builder Gizmo Teachers Guide in specific contexts. This chapter will explore how Element Builder Gizmo Teachers Guide is applied in specialized fields, such as education, business, and technology.
6. In chapter 5, this book will draw a conclusion about Element Builder Gizmo Teachers Guide. The final chapter will summarize the key points that have been discussed throughout the book.

This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. It is highly recommended for anyone seeking to gain a comprehensive understanding of Element Builder Gizmo Teachers Guide.

<https://staging.conocer.cide.edu/About/Resources/index.jsp/Maths%20Exampler%202014%20June%20Grade%201.pdf>

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