

NEW

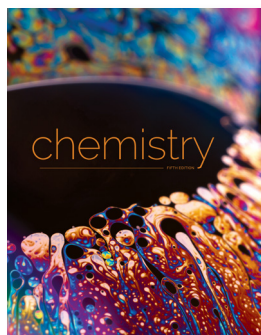
# Chemistry

COMPARISON CHART

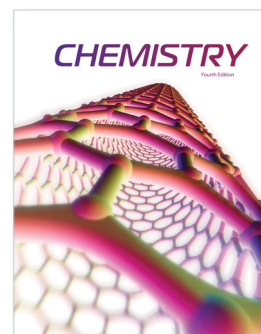
## Updates

*Footsteps for Fours (3rd edition)*

replaces the 2nd edition for the 2021 school year. The content in the two editions is compatible, but significant improvements have been made to design and layout, teaching strategies and helps, biblical worldview shaping, and assessments.



5th Edition



4th Edition

## Basic Features

|                              |  |              |
|------------------------------|--|--------------|
| Student Edition Page Numbers | 628                                      | 593          |
| Chapters                     | 22                                       | 20           |
| Reading Level                | Grades 10–11 progressing to Grades 11–12 | Grades 11–12 |

## Scope & Sequence Updates

- Chapter 4, “Atomic Structure,” has been split into two chapters on atomic structure and electron arrangement.
- Chapter 8, “Chemical Composition and Reactions,” has been split into two chapters on chemical compounds and chemical reactions.
- Chapter 18, “Organic Chemistry and Biochemistry,” has been split into two chapters on organic chemistry and biochemistry.
- Chapter 19, “Materials Chemistry,” has been removed.
- Example problems and section and chapter review problems have been revised to reflect the same level of difficulty.

## Content Revisions

- Adjusted reading level throughout to prepare students for 11th to 12th grade material.
- Adjusted explanations throughout for clarity.
- Increased number of example problems to meet the needs of the customers.
- Explained all example problems fully in both the student edition and teacher edition.
- Formatted expanded solutions in the teacher edition to match the example problems in the student edition.
- Revised chapter content to more effectively prepare students for section and chapter review problems.
- Reduced long explanations of minute details to focus on bigger ideas in a clear, concise manner.
- Added more case studies and webquests throughout.
- Renamed webquests to Worldview Investigations.
- Added more infographics throughout.

## Textbook Snapshot

**6.3 ELEMENTS BY THEIR GROUPS**

*The Importance of Descriptive Chemistry*

Descriptive chemistry is the study of elements and the compounds they form. In this section, you will explore the physical and chemical properties of groups of elements. You will see how scientists have observed the periodicity of atomic properties in the laboratory. Elements in groups on the periodic table have similar electron configurations. Because of their similar configurations, they also have similar physical and chemical properties.

As you read, think about how descriptive chemistry can contribute to serving God and others. Technologies such as detergents, lasers, artificial joints, medicine, fuel cells, nuclear power, fertilizer, and even pest control can be beneficial to people and are the result of understanding elements and the compounds they form. Chemistry is one way to obey God's great command to love our neighbors.

**QUESTIONS**

- What are the groups of the periodic table?
- Why are elements in particular groups?
- What can we tell about an element on the basis of its chemical group?

**TERMS**

alkali metal • alkaline earth metal • transition metal • inner transition metal • lanthanoid series • actinoid series • s-block • sulfide • halogen • noble gas

*What do the elements in a group have in common?*

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**MINILAB**

**DENSE, DENSER, DENSEST?**

There are many physical and chemical properties that change in regular ways along the rows and columns of the periodic table. You have already learned about the trend in atomic radius. You can also quickly see the trend in atomic mass by looking at the periodic table. What do you think this implies about the trend in densities?

**1.** What is the periodic trend for atomic radius and atomic mass from left to right across a row?

**2.** On the basis of your answer to Question 1, what do you predict would be the trend in density?

**Procedure**

1 Use an element handbook or an internet source to find the densities of scandium, manganese, and nickel.

**3.** Do the densities change as expected?

**4.** On the basis of the densities that you looked up, predict the densities for titanium, vanadium, and copper.

**Conclusion**

**4.** How well were you able to predict the density values for these elements?

**Going Further**

1 Look up the densities for germanium, selenium, and krypton.

**5.** Does the periodic trend continue?

**6.** Look at the periodic table on pages 122–23. How can what you observed in Step C tell us about the factors that influence the density of elements?

**EQUIPMENT**

• none

**germanium**

*Can we predict density from information on the periodic table?*

Periodic Table and Elements 133

## New Features

- Added mini-labs to each chapter to provide quick hands-on activities.
- Added ethics boxes throughout to provide opportunities for worldview shaping with real-world problems.
- Added inquiry labs to the lab manual, allowing students to develop their own experimental procedures to investigate a scientific question.