

Welcome to the *You Be The Chemist Challenge*®!

What makes up everything around us? How does it form? Why do different substances have different properties? How does one thing change into something completely different?

We'll answer all of these questions—and many more—in the *Passport to Science Exploration*. These materials show you how the fascinating world of chemistry applies to your everyday life, and teach you how to think about and solve problems like a scientist. **Chemistry is behind everything from making candy to powering rockets!**

Studying chemistry can teach you how to **question assumptions, find solutions, and push the boundaries of what we know**. In these materials, you'll learn how the elements react and combine to form everything around us. But the ability to *think* like a chemist goes beyond the periodic table. Participating in the Challenge prepares you to tackle whatever scientific puzzles come your way, from math to biology to computer science. Whether your career leads you to become an oceanographer, a doctor, a writer, or an entrepreneur, you can still be a scientist by applying the problem-solving skills you are about to learn.



Preparing for the Challenge


The best way to prepare for the Challenge is to review the information contained in the study materials and to fully understand how to use it to solve problems. The *Passport to Science Exploration* is divided into three parts that each prepare you for a level (or levels) of the Challenge:

- *The Core of Chemistry*: Challenge Qualifier and Local Challenge
- *Chemistry Connections*: State Challenge
- *Chemistry Concepts in Action*: National Challenge

This portion, *The Core of Chemistry*, introduces basic chemistry concepts like scientific inquiry, types of matter, and the elements.

Use the tips below to get the most out of CEF's study materials:

1. Review the **Objectives** list provided at the beginning of each section to become familiar with the topics you will learn. Once you have finished the entire chapter, go back and review the Objectives. If you aren't sure you can complete the tasks listed, try reading the section again or seeking additional information (some ideas for where to look for help are listed on the next page).
2. Use the resources posted on CEF's [Suggested Additional Resources page](#) to answer questions that you have while reading the materials, to see additional explanations, and to practice using your knowledge to solve problems.

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3. Make sure to read not only the main text, but also the **Example**, **Quick Fact**, **History**, and **Element** boxes. These boxes deepen your understanding of the concepts and highlight important applications.
 4. Challenge yourself to come up with additional questions based on the topics covered, and try to answer them using the information you've learned.
 5. Use the *You Be The Chemist*[®] Activity Guides to explore chemistry in a real-world setting. To access the Activity Guides, ask a teacher or parent to download them for free from CEF's website.
 6. Answer the questions in the **Think About It...** bubbles. These questions help you practice important problem-solving skills. See if you can work through all of them on your own before looking at outside resources or asking for help.

We also encourage you to explore outside resources and ask others for help. The more you explore, the more likely you are to find answers to the questions you have about the world around you! The following are some good ways to get more information:

- Ask a parent or teacher to explain concepts and give you additional examples.
- Go over the material with a friend and work together to answer any questions you have.
- Find a printed book or publication—such as another chemistry textbook—to hear things explained in a different way.
- Explore the many online resources that are available. Online resources are free and often updated, but you should make sure that any sources you use are reliable and from a credible source—try starting with CEF's [Suggested Additional Resources page](#).

Some supplementary resources are provided on CEF's website, www.chemed.org. Visit the Challenge Study Materials page (www.chemed.org/programs/challenge/study-materials/) to access:

- A list of the major topics included in the study materials;
- Sample questions that illustrate how the concepts can be applied to problems;
- CEF's official competition version of the periodic table.

If you are not sure about how to prepare for a particular level of the competition, ask your teacher or Local/State Challenge Organizer. You may also contact the Chemical Educational Foundation[®] (CEF) at challenge@chemed.org.

Challenge questions are derived from the information contained in CEF's study materials, but are not limited solely to this information. We encourage you to seek additional examples and explanations of chemistry concepts from your teachers, peers, and other science resources. Doing so will help you answer questions that require you to connect concepts and apply your knowledge of chemistry to both familiar and unfamiliar situations.

Go ahead and get started—good luck!