Introductory Chemistry

Laboratory Manual for Distance Learning

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ISBN-13: 978-0-7575-6319-5

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Printed in the United States of America
10 9 8 7 6 5 4 3 2 1

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Acknowledgments

Several of the individuals responsible for the creation of this course are listed on the copyright page of this book. In addition to these people, appreciation is expressed for the contributions of the following individuals:

As coauthors, instructional designer Jon Stephenson, M.S.Ed., and content advisors Nancy Gardner, M.S. (a lecturer in chemistry at California State University, Long Beach), Byron Howell, Ed.D., (a professor of chemistry at Tyler Junior College), and Ken Ostrowski, M.S. (a professor of chemistry at Coastline Community College), worked diligently to coordinate the instructional content of the lab exercises, to refine the background information that links the exercises, and to critique the experiments in this manual to ensure their accuracy and academic validity. Special thanks are owed to the graphic design contributions made by illustrator Don Vierstra.

Preface: How to Take This Lab Course

To the Student

Welcome to the *Introductory Chemistry Laboratory Manual for Distance Learning*. The first lab lesson in this manual deals with basic safety guidelines for conducting lab experiments. The remaining lessons follow a sequence that progresses through the basics of chemical bonds and molecular structure and concludes with such overarching topics as nuclear chemistry and biochemistry.

Learning Outcomes

The designers, academic advisors, and producers of this lab manual have specified the following learning outcomes for students using the *Introductory Chemistry Laboratory Manual for Distance Learning*. After successfully completing the lab exercises, you should be able to:

1. Use the properties of matter and energy to identify chemistry at work in everyday situations.
2. Use critical thinking and problem-solving skills to explain natural phenomena by applying qualitative and quantitative observations.
3. Be an informed consumer and global citizen by evaluating and discussing common chemical principles as they apply in the home and workplace.
4. Critically evaluate ideas and stories relating to chemistry for validity and reliability as they appear in popular media and culture.

Features

This manual is part of an intensive laboratory course that explores the basic concepts and principles of introductory chemistry. Each lesson includes specific learning objectives that students should use to prepare for the lab. The lab manual includes experiments and procedures that illuminate the central principles of chemistry as the study of the structure and properties of substances and how they interact. Each lab lesson includes questions designed to help you analyze, review, and apply your knowledge of the material covered in the lab course. Reading this lab manual, watching the video clips on the accompanying CD, and completing the lab exercises will provide you with information that you would receive in the classroom if you were taking this lab course on campus.

Each lesson in the lab manual contains the following elements:

➛ Introduction

This section introduces the topics covered in the lab exercises, explains why they are important, and makes connections to previous lesson concepts that you'll need to remember.

➛ Learning Objectives

These objectives outline the significant goals intended to be learned from each lab lesson. (Note: Instructors often design test questions after learning objectives, so use them to help focus your study.)

➛ Materials

This section provides a list of materials that will be needed to complete the lab exercises. Some items will be provided in the accompanying lab kit, and others may need to be purchased or borrowed if they are not readily available in your home.

➛ Illustrations

These drawings and photographs have been included to amplify your understanding of specific concepts or to illustrate particular steps and procedures within the course of various lab experiments.

➛ Analysis & Applications

This section includes a variety of questions designed to verify your comprehension of the lab exercises and will help you make connections to and apply the principles covered within the course.

How to Take This Distance Learning Lab

If this is your first experience with distance learning, welcome. Distance learning courses are designed for busy people whose situations or schedules do not permit them to take a traditional on-campus course.

This lab manual is designed to be used as a tool to help reinforce topics and concepts on which you will later be tested. To complete this lab course successfully, you will need to complete exercises that:

- provide you with information that you can apply to your everyday experiences.
- provide visual reinforcement to help you understand and appreciate the complexity of the vast number of chemical processes that occur beneath the surface of life as you know it.
- provide you with the opportunity to practice what you have learned.
- help make the study of chemistry more organized, systematic, and enjoyable. Since you are required to assimilate a large amount of information in a short period of time, a lot of your dedicated time is required. You should be prepared to set aside time when you can tackle and complete an entire lab exercise so that you can master the concepts involved and be prepared for assessment.

Even though you do not have scheduled classes to attend each week on campus, please keep in mind that this is a college-level course. It will require the same amount of work as a traditional, classroom version of this lab course and at the same level of difficulty. As a distance learner, however, it will be up to you alone to keep up with your deadlines. It's important that you schedule enough time to read, study, review, and reflect. Also, take some time immediately after completing a lab lesson to reflect on what you have just learned. This is an excellent time to discuss the lesson with a friend or family member. Your active thinking and involvement will promote your success.