

FOR MY CHILDREN...

Sylvia S. Mader

ESSENTIALS OF BIOLOGY

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PART II• GENETICS

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Teaching Supplements

For the Student

Student Study Guide

Dr. Sylvia Mader has written the *Student Study Guide* that accompanies *Essentials of Biology*, thereby ensuring close coordination with the text. Each text chapter has a corresponding study guide chapter that includes a chapter review, a review of the key terms in the chapter, study exercises and questions for each section of the chapter, and a chapter test. Answers to all questions are provided to give students immediate feedback. Students who make use of the *Student Study Guide* should find that performance increases dramatically. ISBN-13: 978-0-07-321774-1 (ISBN-10: 0-07-321774-3)

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This interactive CD-ROM is an indispensable resource for studying topics covered in the text. It includes chapter outlines, chapter-based quizzes, animations of complex processes, flashcards, PowerPoint® lecture outlines, and PowerPoint® slides of all art and photos found in the textbook. All of the material is organized chapter-by-chapter. Direct links to the text's ARIS website and to the Essential Study Partner are also provided.

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The *Essentials of Biology Laboratory Manual* is written by Dr. Sylvia Mader. With few exceptions, each chapter in the text has an accompanying laboratory exercise in the manual. Every laboratory has been written to help students learn the fundamental concepts of biology and the specific content of the chapter to which the lab relates, as well as gain a better understanding of the scientific method.

ISBN-13: 978-0-07-340341-0 (ISBN-10: 0-07-340341-5)

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Test Bank offers questions that can be used for homework assignments or the preparation of exams.

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- Take attendance
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- Manage lectures and student comprehension through use of the CPS grade book
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Transparencies

This set of overhead transparencies includes every piece of line art in the textbook plus every table. The images are printed with better visibility and contrast than ever before, and labels are large and bold for clear projection.

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ARIS

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Instructor Edition

In addition to all of the resources for students, the Instructor Edition of the Online Learning Center has these assets:

- **Instruction Classroom Performance System (CPS) Question Bank** A set of questions for use with the CPS is provided for every textbook chapter to assist instructors in quickly assessing student comprehension of the concepts.

- **Animations** The next generation of biology animations is available with *Essentials of Biology*. Full-color presentations of key biological processes have been brought to life via animation. These animations offer flexibility for instructors. Designed to be used in lectures, you can pause, rewind, fast-forward, and turn the audio on or off. Many of the animations are also available with Spanish narration and audio.

- **Laboratory Resource Guide** This preparation guide provides set-up instructions, sources for materials and supplies, time estimates, special requirements, and suggested answers to all questions in the *Essentials of Biology Laboratory Manual*.

- **PageOut** McGraw-Hill's exclusive tool for creating your own website for your general biology course. It requires no knowledge of coding and is hosted by McGraw-Hill.

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Mader Micrograph Slides

This set contains one hundred 35mm slides of many of the photomicrographs and electron micrographs in the text.

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PART I • THE CELL

Is it possible to engage students while introducing the principles of biology within the time span of one semester? *Essentials of Biology* is the text that meets the challenge!

My goal in writing *Essentials of Biology* was twofold: to explain the principles of biology clearly and to illustrate them in a captivating, easy-to-understand manner. *Essentials of Biology* is traditional in its approach, organized around the major concepts of biology—the theory of evolution, the cell theory, the gene theory, the theory of homeostasis, and the theory of ecosystems. However, adopters will notice from the outset a decided effort to reach out to today's student. The design and illustration program of the book is appropriate for those who are accustomed to being visually stimulated. The writing style is conversational and inviting in its tone. In short, this book offers the essence of biology without the amount of detail found in other introductory biology texts. Even though this book is succinct, it retains the hallmark features of a Mader book: clear writing, well-developed visuals, a great pedagogical system, and logical organization of chapters.

Because biology is now characterized by new revelations almost daily, it is sometimes difficult to decide what to include in a text. While it is tempting to concentrate on the new, it remains clear that today's students need a good foundation in the basics, just as previous students did. *Essentials of Biology* stresses the principles of biology but uses pertinent applications to increase appreciation and to show that biology is a science relevant to everyday life. Genetics comes alive in Chapter 13, which shows how both Mendelian and molecular genetics can be used to counsel clients about how genetic disorders can be detected, controlled, and/or treated. Chapter 25, a nutrition chapter, shows students how the knowledge of chemistry is beneficial when making dietary decisions to achieve the proper weight and remain healthy. Stem cell research, human diseases, and reproductive choices, all topics of interest to students, are also included. Environmental concerns are addressed, and Chapter 32 concentrates on how human activities impact the biosphere.

An Overview of the Text

The introductory chapter provides students with a preview of biological principles before they take up individual topics. Included are the characteristics of life, an overview of life's diversity, and a discussion of the scientific process.

Part I The Cell

In this part students are introduced to a bit of chemistry before considering the anatomy and physiology of the cell. Cells, like organisms, must acquire and use matter and energy in order to maintain their existence.

Part II Genetics

DNA, the composition of genes, is passed on during cellular and organismal reproduction. Patterns of inheritance are pertinent, but today, the treatment of genetic disorders and cancer is dependent upon molecular genetics. With the sequencing of the human genome, new ways are being found to expand the field of medicine.

Part III Evolution

Biology cannot be understood without a knowledge of evolution. This part begins with a chapter that explains the main points of Darwin's theory and examines the variety of evidence that supports evolution. The mechanisms necessary to microevolution and macroevolution are then considered before the history of life on Earth is reviewed.

Part IV Diversity of Life

The major categories of life are presented and their possible relationships are explored. Students need to be aware of the variety of life with which we share this planet. An evolutionary tree for plants and another for animals become icons for appropriate chapters.

Part V Plant Structure and Function

These chapters instill in the students an appreciation of botany. The flowering plant is used as the representative organism to study the basics of plant anatomy.

Part VI Animal Structure and Function

A comparative theme, which uses the human animal as the representative organism, runs through this part. The emphasis is on homeostasis, which is introduced and explored in Chapter 22.

Part VII Ecology

This part moves from population dynamics through the interactions of populations in communities and ecosystems. The last chapter shows how human activities stress the biosphere and gives reasons why biodiversity should be preserved.

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Icons show students how the element being presented relates to the whole structure or process.

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open the chapter.

A Brief Vignette

relates the illustrations to students' lives.

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lists the major topics for the chapter.

The Concepts

related to each topic are page referenced.

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An extensive chapter summary is organized according to the major sections in the chapter. Brief statements, lists, tables, and artwork help students review the important topics and concepts.

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Thinking Scientifically

Critical thinking questions give students an opportunity to reason as a scientist. Detailed answers to these questions are found in the Answer Appendix in the textbook.

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Website Reminder

This reminder directs you to the book's website for additional quiz questions and other study aids.

Bioethical Issue

A bioethical issue is presented at the end of the chapter. These short readings discuss a variety of controversial topics that confront our society. Appropriate questions in the reading help students fully consider the issue and arrive at an opinion.

Understanding the Terms

The boldface terms in the chapter are page referenced, and a matching exercise allows students to test their knowledge of the terms.