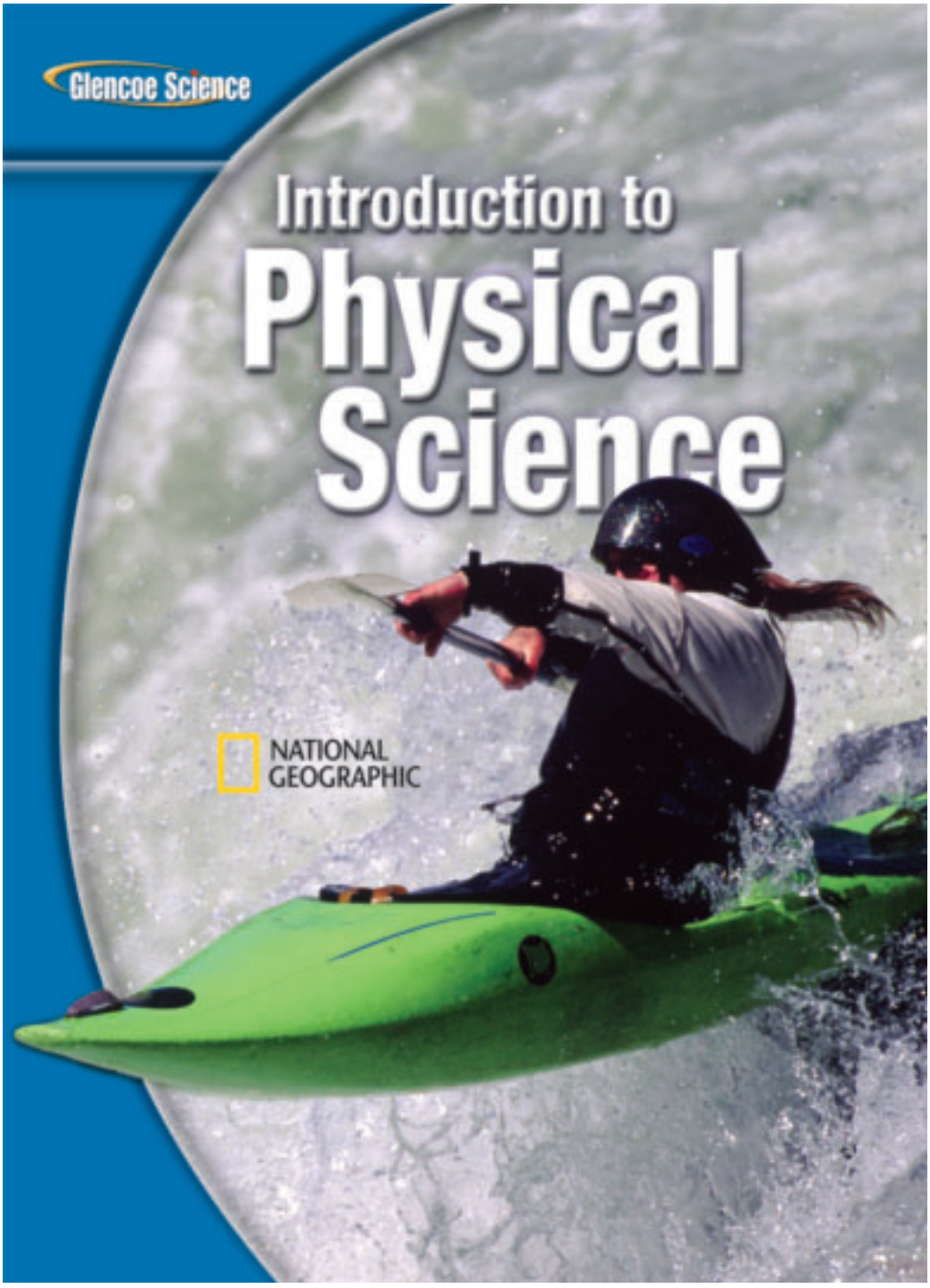

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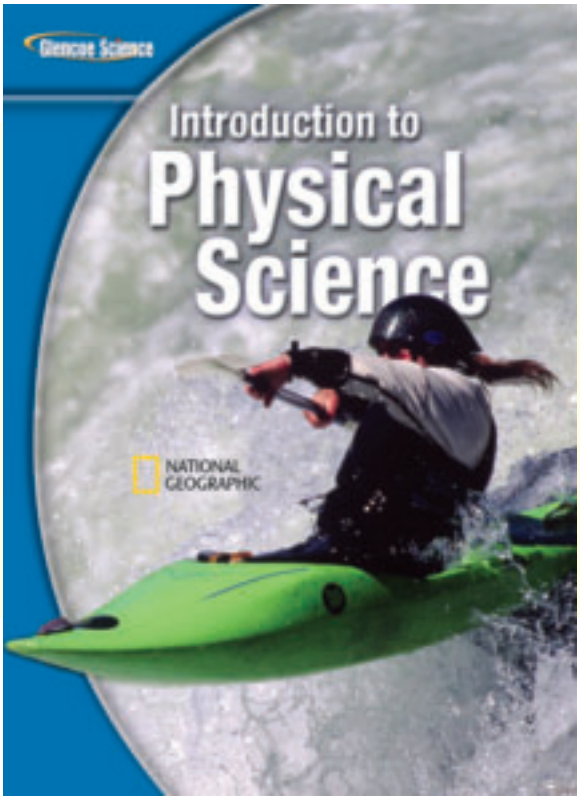
Glencoe Science

Introduction to Physical Science

While gravity brings this kayaker to a landing, an opposing force, buoyancy, determines how deep in the landing pool the boat will submerge. To avoid underwater rocks, larger kayaks are chosen on creeks with steep drops in order to increase buoyancy.



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Send all inquiries to:
Glencoe/McGraw-Hill
8787 Orion Place
Columbus, OH 43240-4027

ISBN: 978-0-07-877804-9
MHIP: 0-07-877804-2

Printed in the United States of America.

1 2 3 4 5 6 7 8 9 10 071/043 09 08 07

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The Student Advisory Board gave the editorial staff and design team feedback on the design of the Student Edition. We thank these students for their hard work and creative suggestions in making the 2008 edition of ***Glencoe Introduction to Physical Science*** student friendly.

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The Glencoe middle school science Student Advisory Board taking a timeout at COSI, a science museum in Columbus, Ohio.

Aaron Haupt Photography

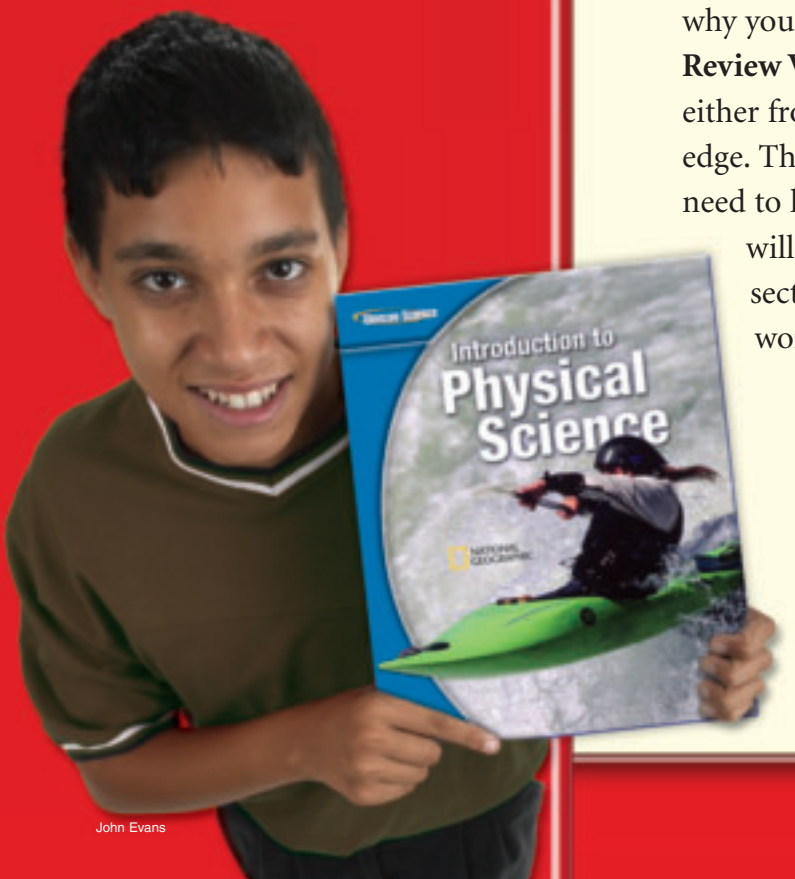
HOW TO...

Use Your Science Book

Why do I need my science book?

Have you ever been in class and not understood all of what was presented? Or, you understood everything in class, but at home, got stuck on how to answer a question? Maybe you just wondered when you were ever going to use this stuff?

These next few pages are designed to help you understand everything your science book can be used for . . . besides a paperweight!

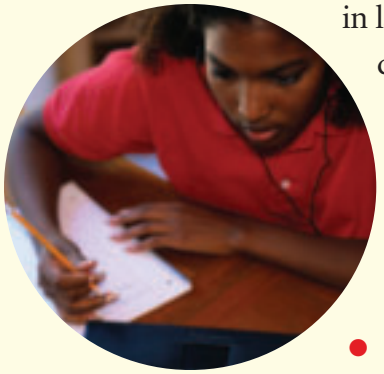


John Evans

Before You Read

- **Chapter Opener** Science is occurring all around you, and the opening photo of each chapter will preview the science you will be learning about. The **Chapter Preview** will give you an idea of what you will be learning about, and you can try the **Launch Lab** to help get your brain headed in the right direction. The **Foldables** exercise is a fun way to keep you organized.
- **Section Opener** Chapters are divided into two to four sections. The **As You Read** in the margin of the first page of each section will let you know what is most important in the section. It is divided into four parts. **What You'll Learn** will tell you the major topics you will be covering. **Why It's Important** will remind you why you are studying this in the first place! The **Review Vocabulary** word is a word you already know, either from your science studies or your prior knowledge. The **New Vocabulary** words are words that you need to learn to understand this section. These words will be in **boldfaced** print and highlighted in the section. Make a note to yourself to recognize these words as you are reading the section.

As You Read

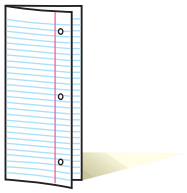


- **Headings** Each section has a title in large red letters, and is further divided into blue titles and small red titles at the beginnings of some paragraphs. To help you study, make an outline of the headings and subheadings.
- **Margins** In the margins of your text, you will find many helpful resources. The **Science Online** exercises and **Integrate** activities help you explore the topics you are studying. **MiniLabs** reinforce the science concepts you have learned.
- **Building Skills** You also will find an **Applying Math** or **Applying Science** activity in each chapter. This gives you extra practice using your new knowledge, and helps prepare you for standardized tests.
- **Student Resources** At the end of the book you will find **Student Resources** to help you throughout your studies. These include **Science, Technology,** and **Math Skill Handbooks,** an **English/Spanish Glossary,** and an **Index.** Also, use your **Foldables** as a resource. It will help you organize information, and review before a test.
- **In Class** Remember, you can always ask your teacher to explain anything you don't understand.

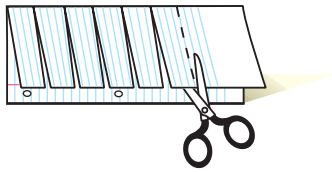
FOLDABLES™ Study Organizer

Science Vocabulary Make the following Foldable to help you understand the vocabulary terms in this chapter.

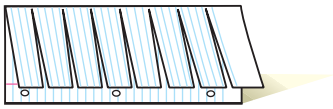
STEP 1 **Fold** a vertical sheet of notebook paper from side to side.



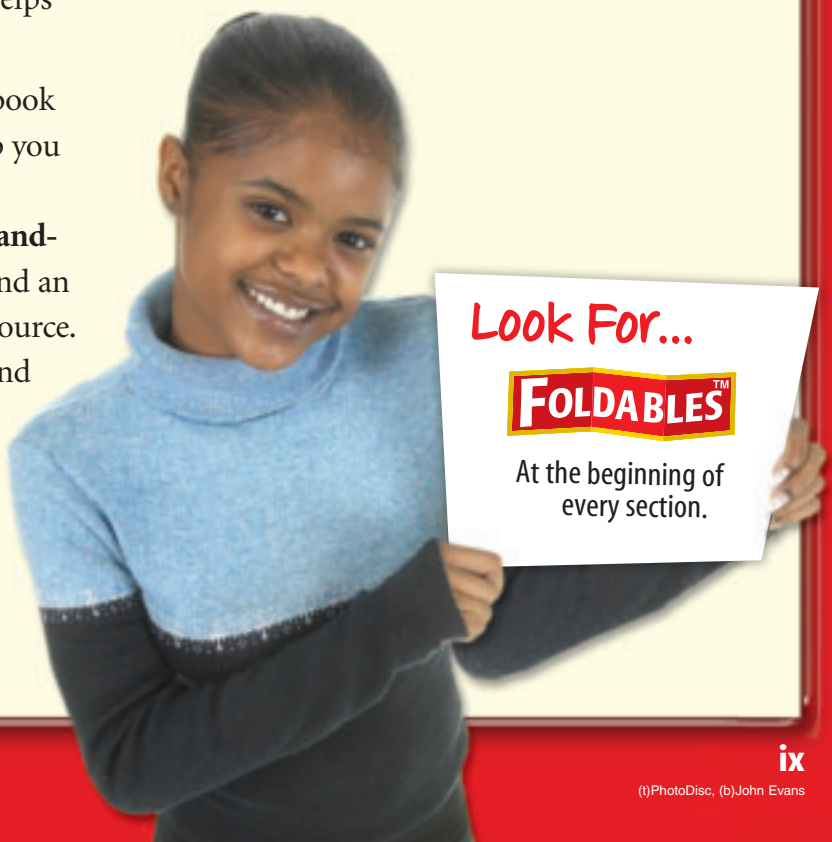
STEP 2 **Cut** along every third line of only the top layer to form tabs.



STEP 3 **Label** each tab with a vocabulary word from the chapter.



Build Vocabulary As you read the chapter, list the vocabulary words on the tabs. As you learn the definitions, write them under the tab for each vocabulary word.



Look For...

FOLDABLES™

At the beginning of every section.

In Lab

Working in the laboratory is one of the best ways to understand the concepts you are studying. Your book will be your guide through your laboratory experiences, and help you begin to think like a scientist. In it, you not only will find the steps necessary to follow the investigations, but you also will find helpful tips to make the most of your time.

- Each lab provides you with a **Real-World Question** to remind you that science is something you use every day, not just in class. This may lead to many more questions about how things happen in your world.
- Remember, experiments do not always produce the result you expect. Scientists have made many discoveries based on investigations with unexpected results. You can try the experiment again to make sure your results were accurate, or perhaps form a new hypothesis to test.
- Keeping a **Science Journal** is how scientists keep accurate records of observations and data. In your journal, you also can write any questions that may arise during your investigation. This is a great method of reminding yourself to find the answers later.

Look For...

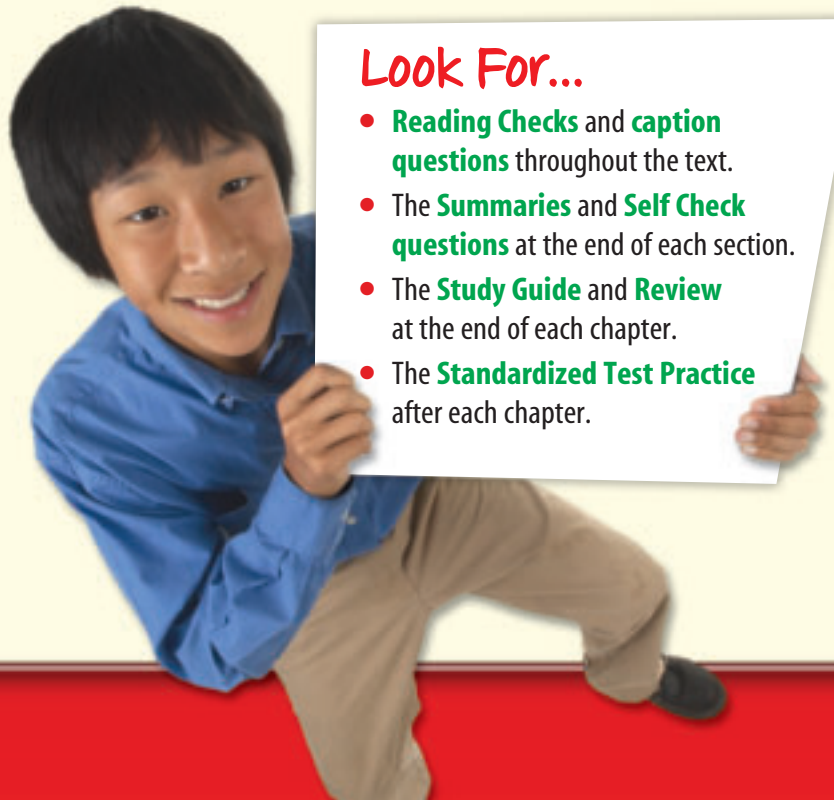
- **Launch Labs** start every chapter.
- **MiniLabs** in the margin of each chapter.
- **Two Full-Period Labs** in every chapter.
- **EXTRA Try at Home Labs** at the end of your book.
- the **Web site** with **laboratory demonstrations.**

Before a Test

Admit it! You don't like to take tests! However, there *are* ways to review that make them less painful. Your book will help you be more successful taking tests if you use the resources provided to you.

- Review all of the **New Vocabulary** words and be sure you understand their definitions.
- Review the notes you've taken on your **Foldables,** in class, and in lab. Write down any question that you still need answered.
- Review the **Summaries** and **Self Check questions** at the end of each section.
- Study the concepts presented in the chapter by reading the **Study Guide** and answering the questions in the **Chapter Review.**

a or b? ? T or F?



Look For...

- **Reading Checks** and **caption questions** throughout the text.
- The **Summaries** and **Self Check questions** at the end of each section.
- The **Study Guide** and **Review** at the end of each chapter.
- The **Standardized Test Practice** after each chapter.

Scavenger HUNT

Let's Get Started

To help you find the information you need quickly, use the Scavenger Hunt below to learn where things are located in Chapter 1.

1. What is the title of this chapter?
2. What will you learn in Section 1?
3. Sometimes you may ask, "Why am I learning this?" State a reason why the concepts from Section 2 are important.
4. What is the main topic presented in Section 2?
5. How many reading checks are in Section 1?
6. What is the Web address where you can find extra information?
7. What is the main heading above the sixth paragraph in Section 2?
8. There is an integration with another subject mentioned in one of the margins of the chapter. What subject is it?
9. List the new vocabulary words presented in Section 2.
10. List the safety symbols presented in the first Lab.
11. Where would you find a Self Check to be sure you understand the section?
12. Suppose you're doing the Self Check and you have a question about concept mapping. Where could you find help?
13. On what pages are the Chapter Study Guide and Chapter Review?
14. Look in the Table of Contents to find out on which page Section 2 of the chapter begins.
15. You complete the Chapter Review to study for your chapter test. Where could you find another quiz for more practice?

Contents

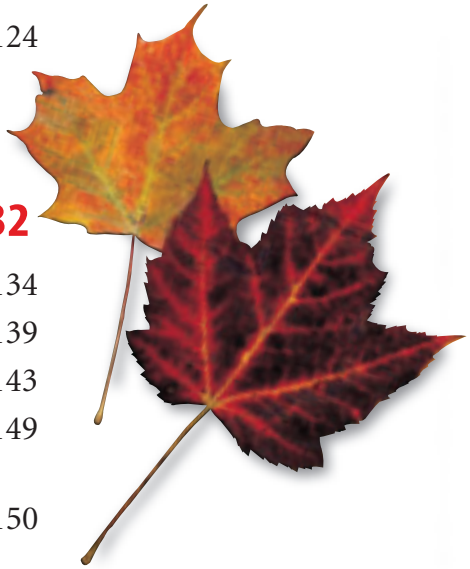
In each chapter, look for these opportunities for review and assessment:

- Reading Checks
- Caption Questions
- Section Review
- Chapter Study Guide
- Chapter Review
- Standardized Test Practice
- Online practice at ips.msscience.com

Get Ready to Read Strategies

NASA

Contents



unit 3 Chemistry—158

In each chapter, look for these opportunities for review and assessment:

- Reading Checks
- Caption Questions
- Section Review
- Chapter Study Guide
- Chapter Review
- Standardized Test Practice
- Online practice at ips.msscience.com

Get Ready to Read Strategies

Sovfoto/Eastfoto/PictureQuest

unit 4 Motion and Forces—278

In each chapter, look for these opportunities for review and assessment:

- Reading Checks
- Caption Questions
- Section Review
- Chapter Study Guide
- Chapter Review
- Standardized Test Practice
- Online practice at ips.msscience.com

PhotoDisc

Get Ready to Read Strategies

Contents

In each chapter, look for these opportunities for review and assessment:

- Reading Checks
- Caption Questions
- Section Review
- Chapter Study Guide
- Chapter Review
- Standardized Test Practice
- Online practice at ips.msscience.com

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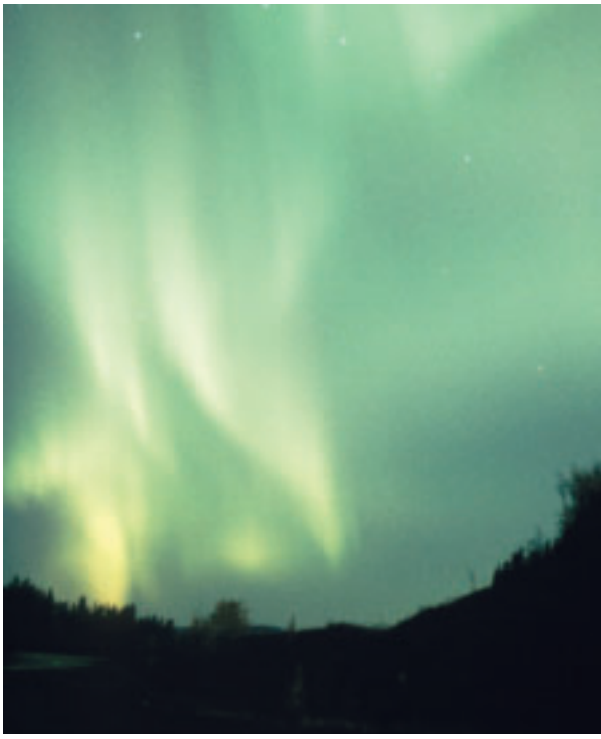
Get Ready to Read Strategies



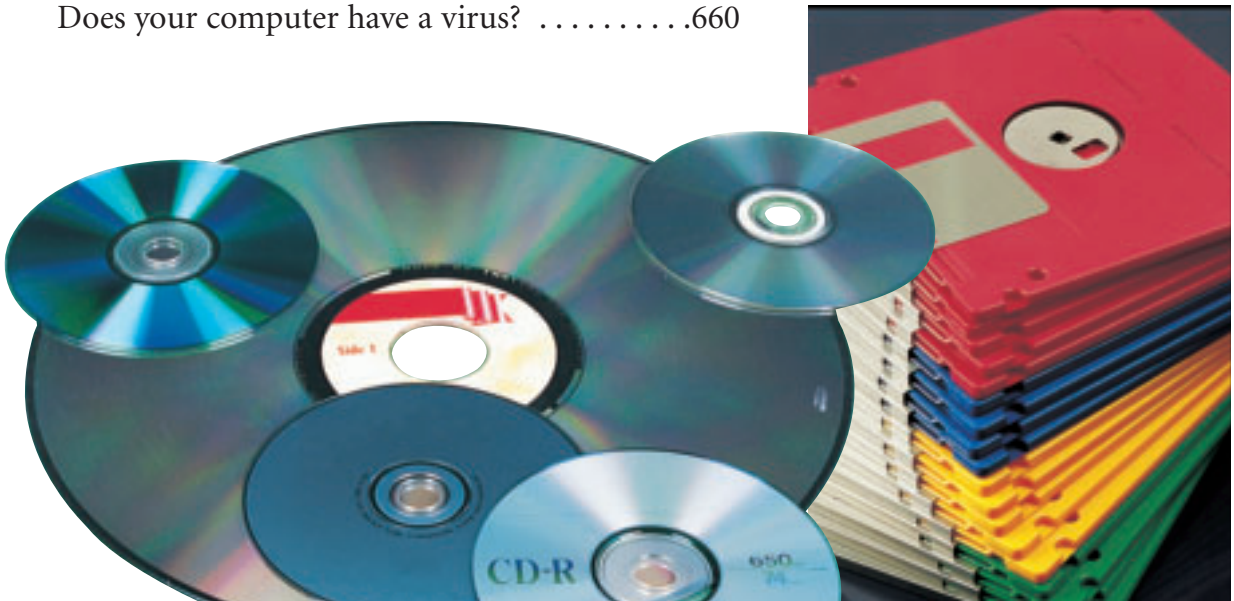
Bjorn Backe/Papilio/CORBIS

unit 7 Electricity & Magnetism—580

In each chapter, look for these opportunities for review and assessment:

- Reading Checks
- Caption Questions
- Section Review
- Chapter Study Guide
- Chapter Review
- Standardized Test Practice
- Online practice at ips.msscience.com

Get Ready to Read Strategies



Student Resources—668

Amanita Pictures

Cross-Curricular Readings

NATIONAL GEOGRAPHIC Unit Openers

NATIONAL GEOGRAPHIC VISUALIZING

Bobby Model/National Geographic Image Collection

Cross-Curricular Readings

TIME SCIENCE AND Society

TIME SCIENCE AND HISTORY

Oops! Accidents in SCIENCE

Science and Language Arts

SCIENCE Stats

LABS

available as a video lab

Launch LAB

Mini LAB

Matt Meadows

Mini LAB Try at Home

LABS

available as a video lab

One-Page Labs

Morrison Photography

Two-Page Labs

Design Your Own Labs

Model and Invent Labs

Use the Internet Labs

Activities

Applying Math

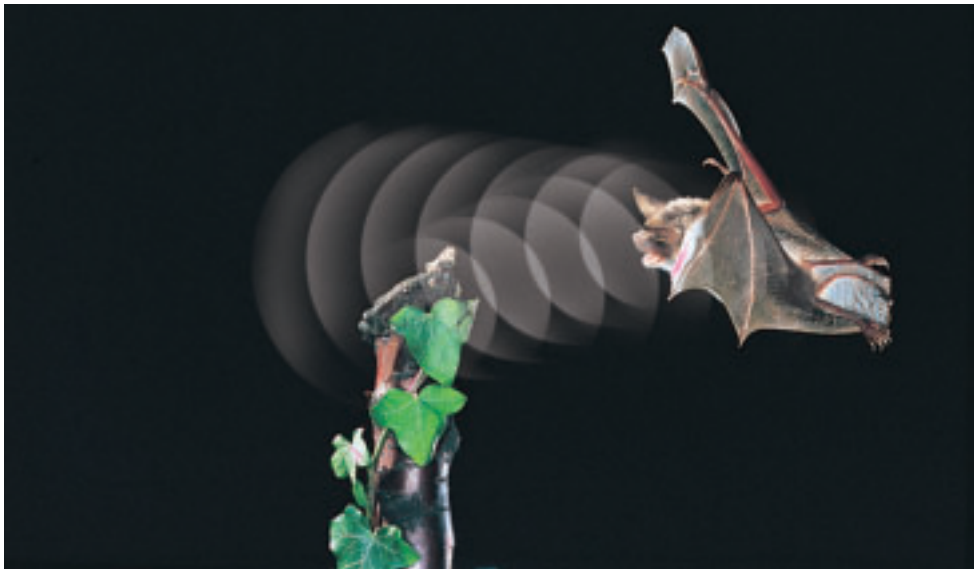
Applying Science

Activities

INTEGRATE

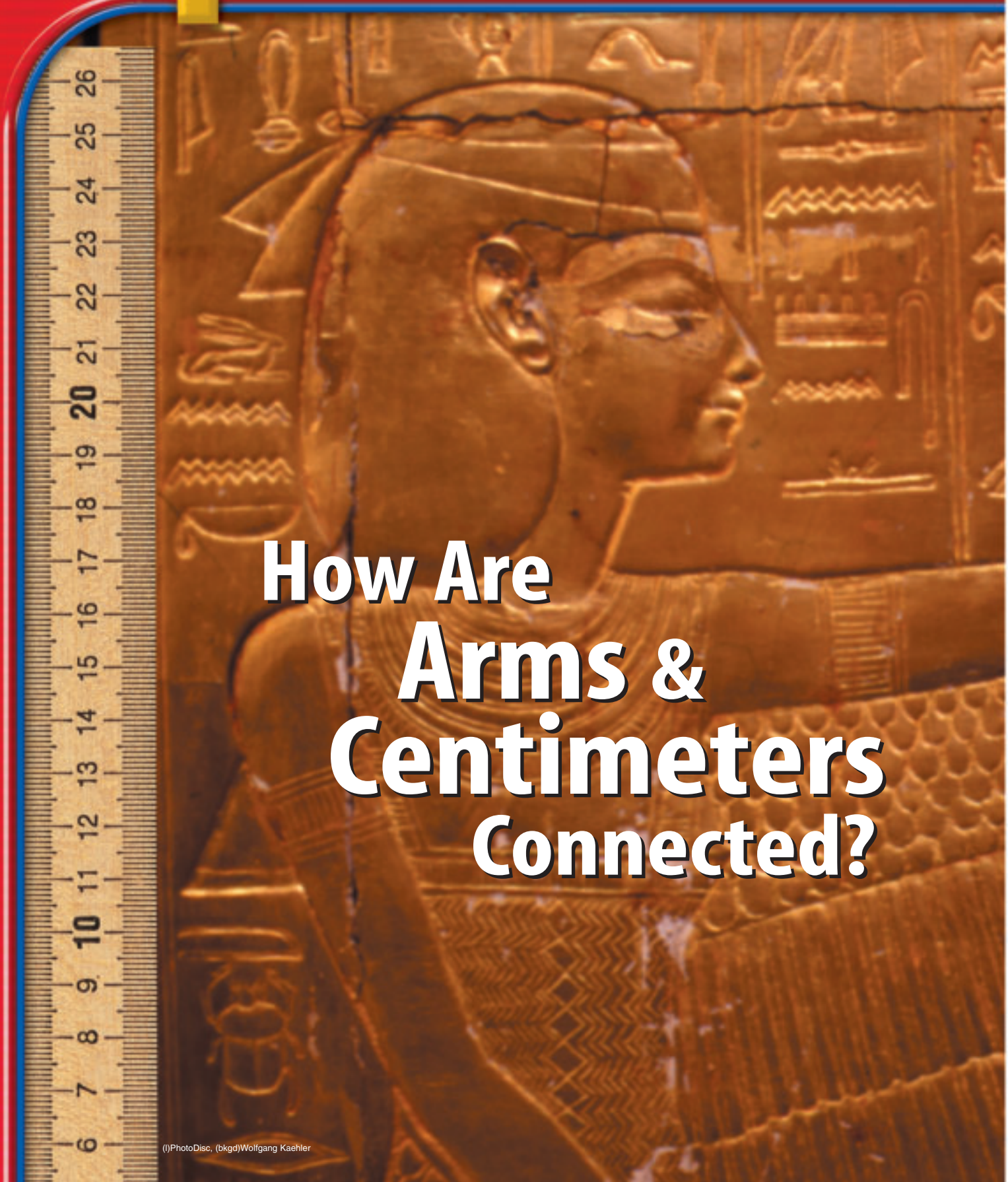
Science Online

Standardized Test Practice



unit 1

The Nature of Science



How Are Arms & Centimeters Connected?

About 5,000 years ago, the Egyptians developed one of the earliest recorded units of measurement—the cubit, which was based on the length of the arm from elbow to fingertip. The Egyptian measurement system probably influenced later systems, many of which also were based on body parts such as arms and feet. Such systems, however, could be problematic, since arms and feet vary in length from one person to another. Moreover, each country had its own system, which made it hard for people from different countries to share information. The need for a precise, universal measurement system eventually led to the adoption of the meter as the basic international unit of length. A meter is defined as the distance that light travels in a vacuum in a certain fraction of a second—a distance that never varies. Meters are divided into smaller units called centimeters, which are seen on the rulers here.

unit projects

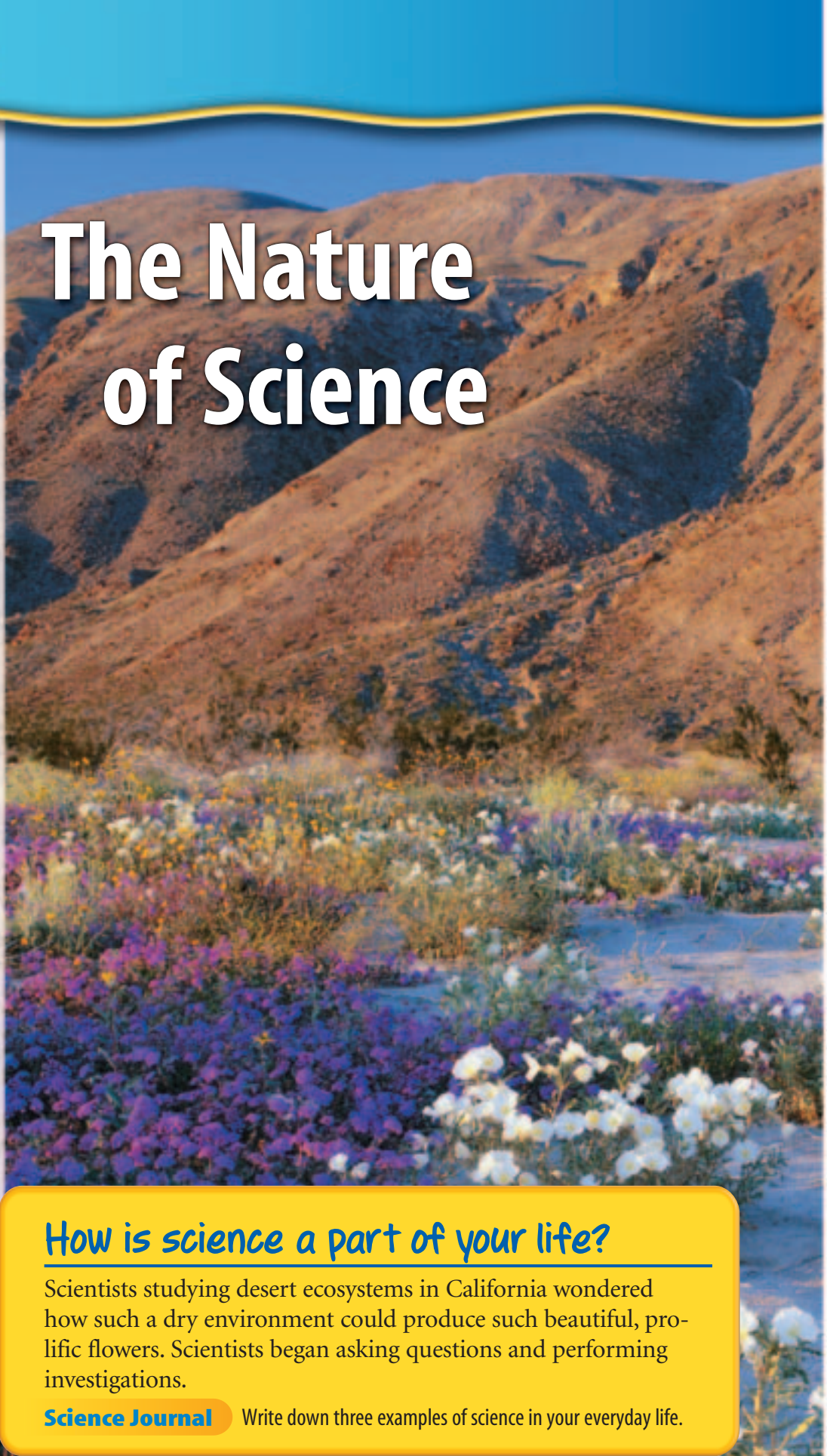
Visit **ips.msscience.com/unit_project** to find project ideas and resources. Projects include:

- **History** Brainstorm characteristics of science fields, and then design a collage with science ideas for a ceiling tile or book cover.
- **Technology** Convert a family recipe from English measurement to SI units of measurement. Enjoy a classroom bake-off!
- **Model** Create a character in an SI world. Develop a picture storybook or comic book to demonstrate your knowledge of SI measurement.

WebQuest *The Nature of Science: Evaluating Bias in Advertisements* helps students to become informed about the techniques of advertising and evaluate bias in print media.

chapter 1

The Nature of Science



The BIG Idea

Science is an organized method of learning about the natural world.

SECTION 1
What is science?

Main Idea Science describes observations of the natural world and proposes explanations for those observations.

SECTION 2
Science in Action

Main Idea Scientific investigations follow a general pattern of observing, hypothesizing, investigating, analyzing, and concluding.

SECTION 3
Models in Science

Main Idea A model is a representation of an object or event that helps scientists understand the natural world.

SECTION 4
Evaluating Scientific Explanation

Main Idea How reliable an explanation is depends on the accuracy of the observations and conclusions supporting the explanation.

How is science a part of your life?

Scientists studying desert ecosystems in California wondered how such a dry environment could produce such beautiful, prolific flowers. Scientists began asking questions and performing investigations.

Science Journal Write down three examples of science in your everyday life.

Start-Up Activities

Launch LAB

Observe How Gravity Accelerates Objects

Gravity is a familiar natural force that keeps you anchored on Earth, but how does it work? Scientists learn about gravity and other concepts by asking questions and making observations. By observing things in action scientists can study nature. Perform the lab below to see how gravity affects objects.

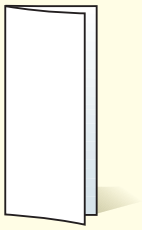
1. Collect three identical, unsharpened pencils.
2. Tape two of the pencils together.
3. Hold all the pencils at the same height as high as you can. Drop them together and observe what happens as they fall.
4. **Think Critically** Did the single pencil fall faster or slower than the pair? Predict in your Science Journal what would happen if you taped 30 pencils together and dropped them at the same time as you dropped a single pencil.

Science Online | Preview this chapter's content and activities at ips.msscience.com

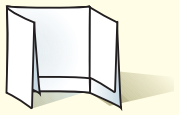
FOLDABLES™ Study Organizer

Science Make the following Foldable to help identify what you already know, what you want to know, and what you learned about science.

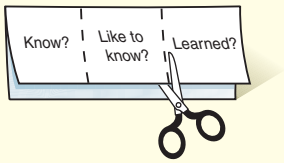
STEP 1 **Fold** a vertical sheet of paper from side to side. Make the front edge about 1/2 inch shorter than the back edge.



STEP 2 **Turn** lengthwise and fold into thirds.



STEP 3 **Unfold and cut** only the top layer along both folds to make three tabs. **Label** each tab.



Identify Questions Before you read the chapter, write what you already know about science under the left tab of your Foldable, and write questions about what you'd like to know under the center tab. After you read the chapter, list what you learned under the right tab.

David Keaton/CORBIS