Section 3

Why Study Science?

Reading Preview

Key Concepts

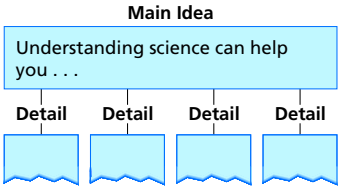
- Why do people need to understand scientific principles and think scientifically?
- What is scientific literacy and why is it important?

Key Term

- scientific literacy

Target Reading Skill

Identifying Main Ideas As you read about the importance of studying science, write the main idea in a graphic organizer like the one below. Then write four supporting details that further explain the idea.



Lab zone **Discover Activity**

How Much Do You See or Hear About Science?

1. Watch a half-hour evening news broadcast. List all the news stories that have something to do with a science topic.
2. Watch the ads during the broadcast and list the ones that make scientific claims.

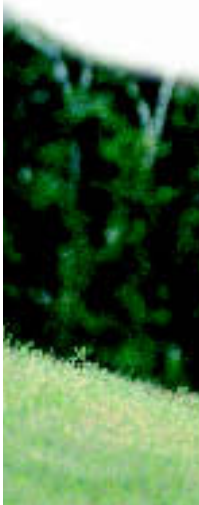
Think It Over

Inferring Were you surprised at how often science topics were mentioned on the news or in ads? Based on your observations, why is it important to study science?

Your eyes are glued to the screen. You watch as two explorers from the special investigations unit, Theta 7, activate the matter resequencer and teleport to their next destination. Three thousandths of a second later, they arrive at Sector 1572. The land is inhabited by giant fire ants and other creatures grown out of proportion. Because the explorers' garments make them nearly invisible, they move through the sector without being noticed by the giant creatures.

As the movie ends, you think how great it would be if you could teleport yourself or become invisible. This was only a movie, but could these things be possible some day? What about the giant ants? Could insects that large ever really exist?

From science fiction movies to nightly news reports, science is all around you. That's why you need to have a basic knowledge of science. **Being able to understand scientific principles and think scientifically can help you solve problems and answer many questions in your everyday life.** This section presents some of the questions that people ask every day.



How Does It Work?

You are standing in line at the grocery store. The cashier scans each item with a laser. The customer in front of you pulls out a credit card and runs the magnetic stripe through a slot. The machine reads information on the card and sends the data to a distant computer. Devices such as these are a common part of our daily lives. They have changed almost every aspect of how people live and work. All of them have some basis in science. But could you explain how any of these devices work?

Of course, as a customer, you don't really need to know how these devices work. But what if you were the cashier and one of the devices stopped working? Or what if you were shopping for a bicycle? Do you know how gears work or which metal is lightweight, yet sturdy? Knowing some science and thinking scientifically could help you make the right choice.

Learning science can also help you understand natural events that affect your daily life. For example, how do tornadoes form? Can listening to loud music damage your hearing? Being able to answer questions like these can help you make wise decisions and stay safe.

Reading Checkpoint **How might knowing science help you shop for a bicycle?**

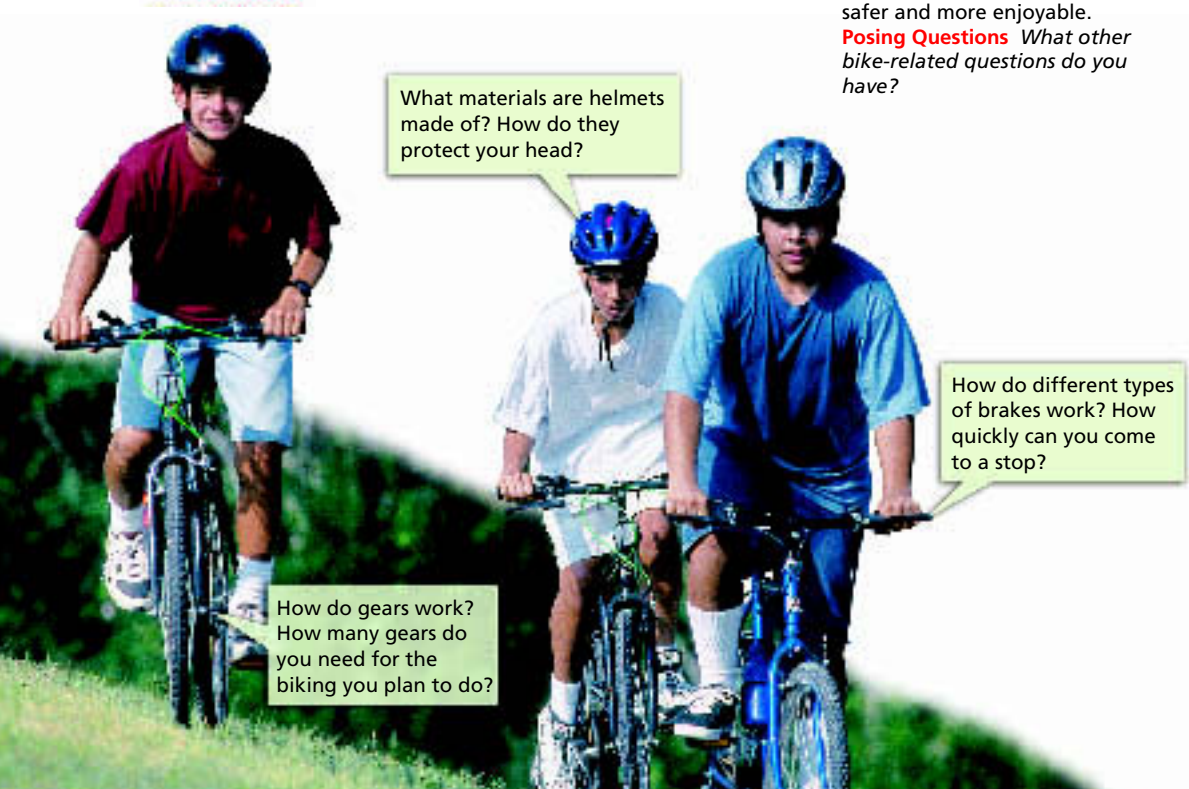


FIGURE 15
How Things Work
Learning the science behind how things work can help make everyday activities, such as biking, safer and more enjoyable.
Posing Questions *What other bike-related questions do you have?*

FIGURE 16
Staying Healthy
Knowing the science behind health and nutrition issues can help you make wise shopping decisions.
Making Judgments *What scientific information do you rely on when making food choices?*

How Can I Stay Healthy?

"Jump higher, run faster! Improve your athletic abilities with new Superstar Energy Bar. Buy it now!" This is not a real advertisement, but you may have seen ads with similar claims. Would you buy the product based on this ad? If not, suppose the ad went on to say, "Studies have shown that Superstar Energy Bar improves people's athletic abilities more than other brands." Now would you be convinced?

Scientific thinking can help you to evaluate advertised claims. For example, you might question whether the claims are based on a controlled study. You might want to know how the study measured improvement in athletic ability and how many people were studied.

Eating well is one way to maintain your health. Getting enough exercise and avoiding exposure to disease are other ways. Which exercises are best for you? Should you take pills to help your muscles grow stronger? Can going out on a cold, wet day really make you sick? These are the kinds of questions that studying science will help you answer.

Reading Checkpoint **What information might help you evaluate advertised claims?**

Lab Zone Skills Activity

Posing Questions

Look through a magazine and select an ad that makes a scientific claim. Write down five questions that you would want answered before you would believe the claim. Choose one of the questions and plan a way to find the answer.

How Do I Become an Informed Citizen?

Have you ever heard people discuss their views on a public issue? For example, should a town restrict water use in the summer? Should scientists continue to explore space? Should old paint in a building be removed? Issues like these often generate much debate.

Take space exploration, for example. What can we learn from space missions? What are the costs and risks? Would the money be better spent on projects closer to home? These are just a few of the questions that might come up during a debate.

As you grow older, you will have more and more opportunities to voice your opinion on public issues—at public hearings, in the voting booth, or by just talking with friends. And more and more public issues involve science. Understanding the science will help you weigh the pros and cons and arrive at a decision.

Reading Checkpoint **Where are some places you can voice your opinions on public issues?**

What Is the Best Use of Earth's Resources?

"Paper or plastic?" Have you ever heard this question from a store clerk? Although the question seems simple, it's not. Do you know enough science to arrive at an answer?

You might be surprised to learn that the clerk's question has something to do with science. But think about how these bags were produced and where they might end up after you use them. Is one choice better than the other? That is a complex question that scientists are studying.

Scientists are also studying other topics related to Earth's resources. For example, you may have heard about cars that run on fuels other than gasoline. What are the advantages and disadvantages of these types of cars? What's involved in developing other sources of fuels?

Topics related to Earth's resources may seem far removed from your life, but in fact, they're not. Have you ever wondered where the water in your toilet comes from? Where does the water go after you flush the toilet? And why do adults always tell you to turn off the lights when you leave a room? Could the world's energy sources ever really run out? Learning science will help you answer questions like these.

Reading Checkpoint

What are two decisions related to Earth's resources that you faced today?

FIGURE 17
Using Earth's Resources Wisely
Should you walk or ride in a car to a nearby destination? Knowing science can help you make wise decisions that impact Earth's resources.

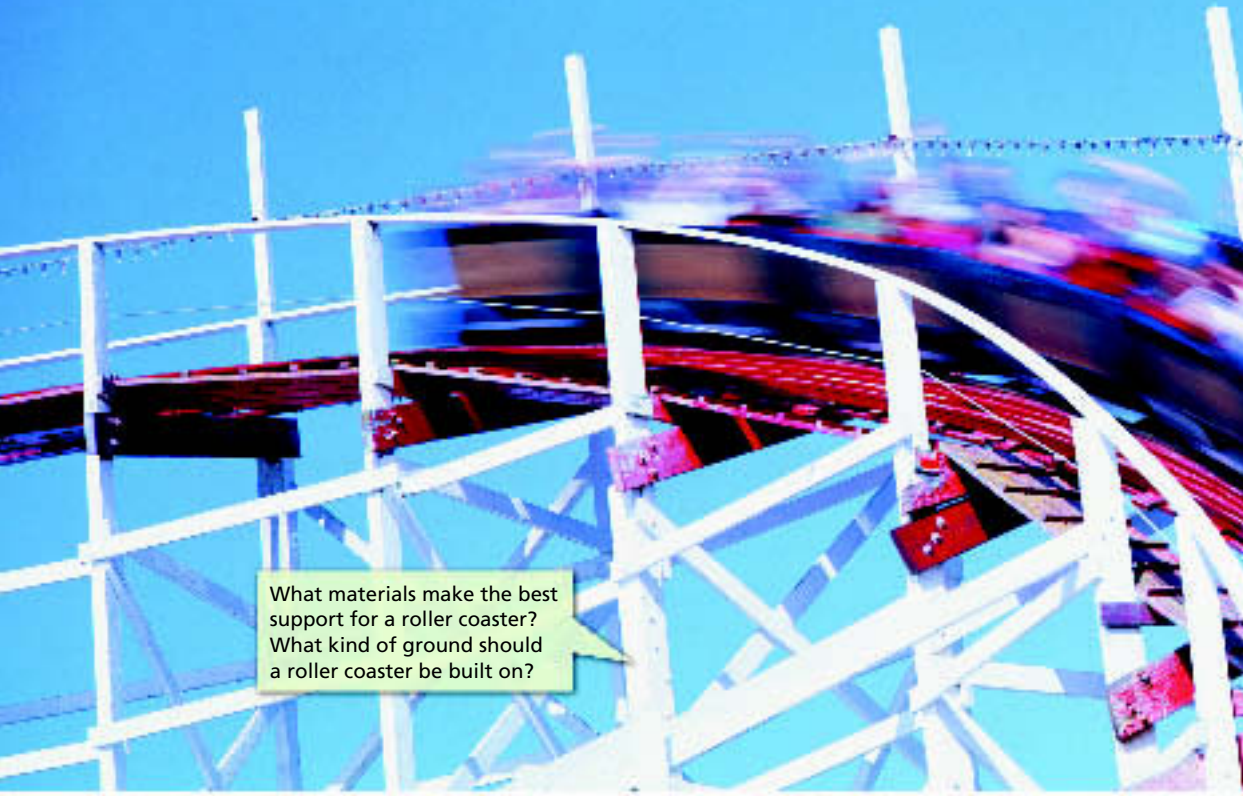


FIGURE 18
Scientific Literacy
Even a roller coaster ride can generate many scientific questions! Having scientific literacy can help you identify good sources of scientific information in which to find answers.

Go Online
SCILINKS NSTA
For: Links on scientific literacy
Visit: www.SciLinks.org
Web Code: scn-1613

Scientific Literacy

Are you still wondering why you should study science? Or, at this point, are you instead wondering how you could possibly learn everything there is to know?

Of course, it is not possible to become an expert in every field of science. Nor is it possible to test everything scientifically by yourself. Instead, you need to have scientific literacy. Having **scientific literacy** means that you understand basic scientific terms and principles well enough that you can evaluate information, make personal decisions, and take part in public affairs. **By having scientific literacy, you will be able to identify good sources of scientific information, evaluate them for accuracy, and apply the knowledge to questions or problems in your life.** You will also be able to keep up with the latest scientific trends and be well qualified for jobs.

So, why should you study science? The real question is, why wouldn't you?

Reading Checkpoint **Why is a good understanding of scientific terms and principles important?**

Section 3 Assessment

Target Reading Skill

Identifying Main Ideas Use your graphic organizer about the importance of studying science to answer the questions below.

Reviewing Key Concepts

1. **a. Reviewing** List two questions that a knowledge of science could help you answer.
   b. Summarizing How does understanding scientific principles and thinking scientifically apply to your everyday life?
   c. Applying Concepts A friend tells you that studying science is only for scientists. How could you convince your friend otherwise?
2. **a. Defining** What is scientific literacy?
   b. Problem Solving You are watching the news on TV and hear about "DNA fingerprinting." How could you find out what that is?

Writing in Science

Comic Strip Design a five-panel comic strip that illustrates the importance of science education in a humorous way. Your comic strip should show a particular situation in which a knowledge of science would have been important.