

Lesson 1

From Cells to Body Systems

Guide to Reading

● Building Vocabulary

Write each term below in your notebook. As you come across the term in your reading, write its definition.

- cells (p. 177)
- tissues (p. 177)
- organs (p. 177)
- body systems (p. 177)

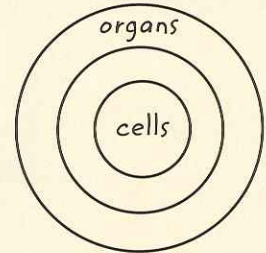
● Focusing on the Main Ideas

In this lesson, you will learn to

- **identify** the body's building blocks.
- **name** the major body systems and identify their functions.
- **list** ways to care for your body systems.

● Reading Strategy

Organizing Information Make a bull's-eye diagram like the one to the right. Show how cells and other "building blocks" of the body relate.



FOLDABLES Study Organizer Use the Foldable® on p. 175 as you read this lesson.

Quick Write

Watch your hand as you form a fist and then release it. Try to name the parts you see working together.

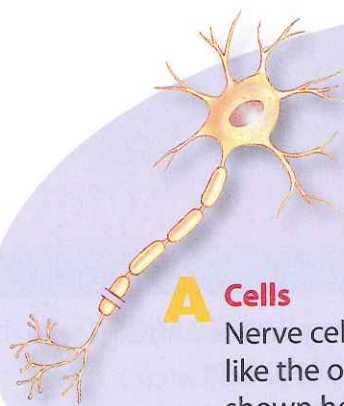
Parts of the Body

Have you ever looked inside a computer? If you have, you know there are many parts that work together. Each part does a separate job. The same is true of your body. Like a computer, your body has a command center. It gives instructions to muscles and joints so that you can raise your arms. It is instructing your eyes to read this page right now!

► **FIGURE 7.1**

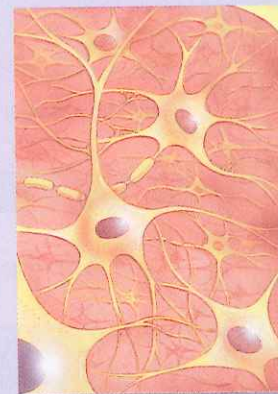
BUILDING BLOCKS OF THE BODY

The body system shown here is the nervous system. **What is the most basic building block of the nervous system?**



A Cells

Nerve cells, like the ones shown here, carry messages to and from your brain.



B Tissues

This tissue is made up of nerve cells.

From Cells to Systems

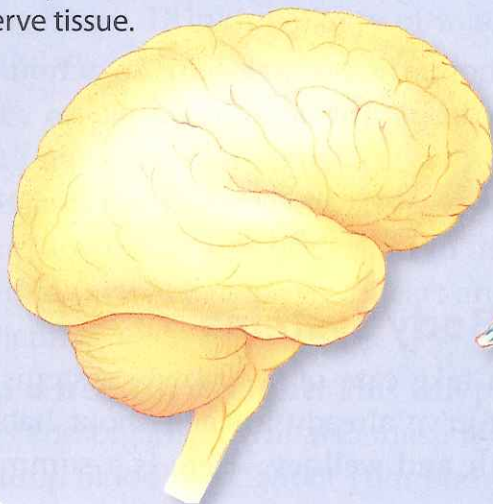
Your body is made up of many different kinds of cells, which **vary** in size and shape. **Cells** are *the basic building blocks of life*. Each cell does a specialized job. Nerve cells, for example, carry messages to and from your brain. Skin cells, on the other hand, are flat and rectangular. This allows them to spread out and cover the surface of your body.

Groups of similar cells that do the same kind of work are called **tissues**. For example, nerve cells such as those shown in **Figure 7.1** come together to form nerve tissue. Tissues come together to form organs. **Organs** are *structures made up of different types of tissues that all work together*. For example, your heart is an organ made up of muscle tissue, nerve tissue, and blood tissue. Organs perform specific jobs. Your brain is an organ that allows you to think and feel. Your stomach is an organ that digests and stores the food you eat. The next level up from organs is body systems. **Body systems** are *groups of organs that perform a body function*. For example, the digestive system breaks down food for energy.

Academic Vocabulary

vary (VAIR ee) (verb) to be different. *The organs of the body vary in shape and size.*

C Organs
This organ, the brain, is made mostly of nerve tissue.



D Body System
The nervous system sends messages from the brain to different parts of your body.

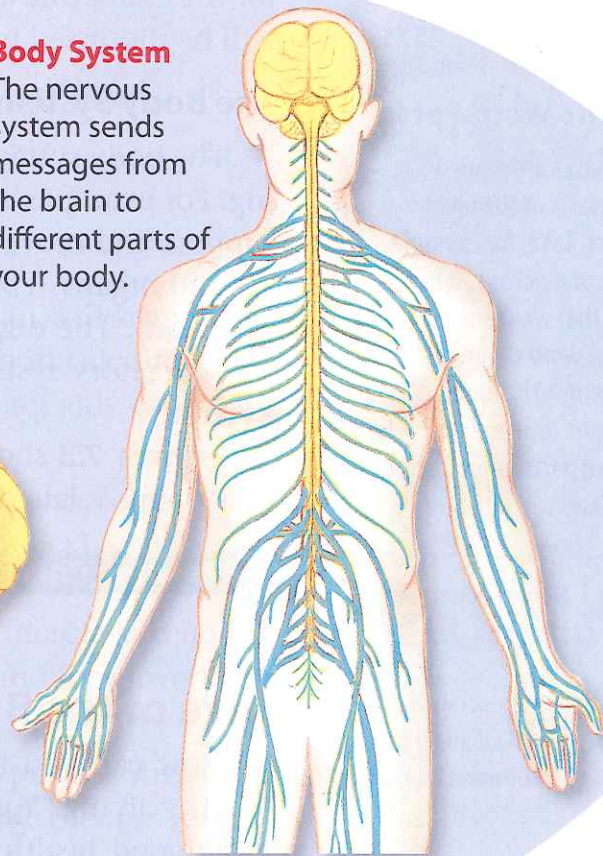


FIGURE 7.2

MAIN BODY SYSTEMS AND THEIR FUNCTIONS

The chart shows the main body systems. **Which of these work together?**

Body System	Jobs
Circulatory system	Brings food and oxygen to cells and takes away cell waste
Digestive system	Breaks down food for energy
Endocrine system	Produces hormones that regulate body functions
Excretory system	Gets rid of body wastes
Muscular system	Allows movement of body parts
Nervous system	Controls all body systems; sends and receives messages; and helps you see, hear, taste, smell, and feel
Reproductive system	Involved in producing <i>offspring</i> , or children
Respiratory system	Carries oxygen to blood and removes carbon dioxide
Skeletal system	Provides a hard cage to protect body organs, gives the body structure, and works with the muscular system to allow movement



Connect To... Language Arts

Scientific Word Parts

Many diseases are named after the parts of the body they affect. Take, for example, the word *osteoporosis*. It is a disease that weakens the bones. The word's root, "*osteo*" means "bone." The ending, "*osis*" means "disease of."

Other word parts named after the body are:

- Optic Eye
- Neur(o) Nerves or nervous system
- Cardi(o) Heart
- Bronch(io) Lungs

What body system do you think is affected by bronchitis?

The names and functions of the major body systems appear in **Figure 7.2**. This chapter will cover all of these systems except for the endocrine and reproductive systems. Those two systems will be discussed in Chapter 8.

The Body Systems Work Together

The body systems work together to keep the body functioning. For example, the skeletal and muscular systems pair up to support and move the body. They also form a protective shell around organs. The digestive and excretory systems also work as a team. The digestive system breaks down food for energy. The excretory system gets rid of unused food from your body as waste.

Figure 7.3 shows the body systems in action. Notice how all systems relate during the act of running.



Reading Check

List Name three body systems, and tell what each does.

Care of the Body Systems

How can you take care of your body systems? The key is healthy living. You've already learned about habits that promote good health and wellness. Here is a summary of some useful ideas.

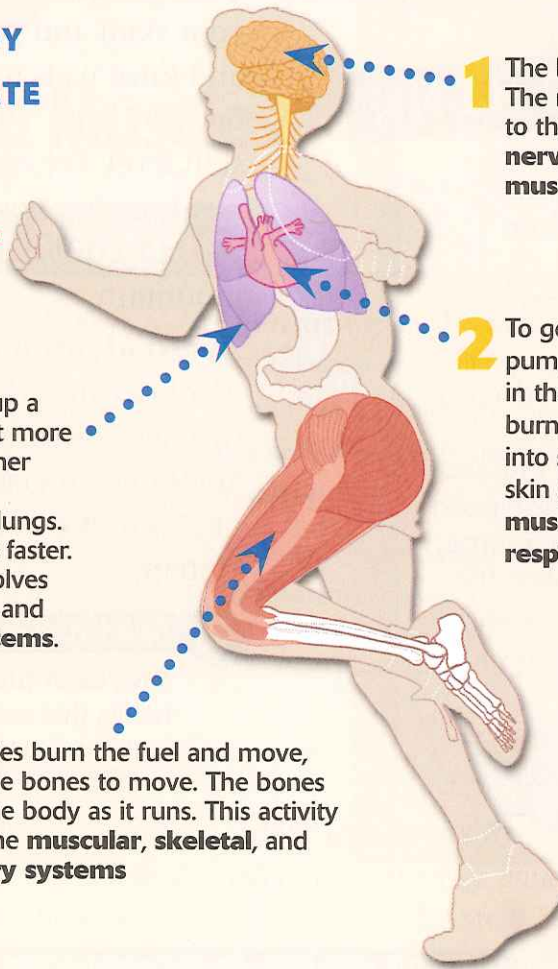
► **FIGURE 7.3**

How the Body Systems Relate

The body systems depend on each other. **How many systems are active when you run?**

4 Running burns up a lot of fuel. To get more oxygen, the runner gasps for breath provided by his lungs. His heart pumps faster. This process involves the **respiratory** and **circulatory systems**.

3 The muscles burn the fuel and move, causing the bones to move. The bones support the body as it runs. This activity involves the **muscular, skeletal, and circulatory systems**



1 The brain sends out a message: Run! The message is carried through nerves to the muscles. This step involves the **nervous system** and the **muscular system**.

2 To get energy, muscles need blood that is pumped by the heart. Blood contains fuel in the form of sugar as well as oxygen to burn that fuel. As blood flows, wastes pass into sweat glands that release them through skin pores. These processes involve the **muscular, circulatory, digestive, respiratory, and excretory systems**.

- **Eat well.** Following a balanced eating plan will keep your heart and bloodstream healthy. Foods rich in calcium build strong bones. Drinking plenty of water aids your digestive and excretory systems.
- **Get plenty of physical activity.** Teens, should get an hour of physical activity most days. Physical activity makes muscles, bones, and joints stronger. Proper warm-ups and cooldowns are also important to muscle and bone health. Aerobic activity helps your heart and lungs work more efficiently.
- **Maintain a healthy weight.** This will put less stress on your bones and organs. It will also make it easier for your heart to pump blood throughout your body.

Go Online

Visit glencoe.com and complete the Interactive Study Guide for Lesson 1.

What

Teens

THINK



How can a person avoid injury when playing sports or other physical activities?

Someone can avoid injury while playing a sport by stretching before playing. This allows your muscles to warm up and get loose. You also need to wear the right protective gear for the sport you are playing. Finally, when the season is done, don't stop exercising. Keep stretching and running to stay in shape for the next season.

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- **Play it safe.** Make sure to wear the right gear. A helmet can protect your skull and your brain. Elbow and knee pads will help prevent broken bones. Pay attention to your skill level. For example, if you are just learning how to ski, don't try the most difficult course on the mountain.
- **Avoid alcohol and drugs.** Alcohol can seriously damage the liver and other important organs. Smoking damages the lungs. Drugs of all kinds can damage the nervous system.

Reading Check

Give Examples Name two habits that keep your body systems healthy.

Lesson 1 Review

After You Read

Review this lesson for new terms, major headings, and Reading Checks.

What I Learned

1. **Vocabulary** Define *tissues*.
2. **Give Examples** What is the function of the circulatory system?
3. **Recall** Name some behaviors that keep the skeletal system healthy.

Thinking Critically

4. **Synthesize** Give an example of a risk a teen might take. Show how this behavior affects one or more body systems.

5. **Analyze** How might an injury to your nervous system affect your muscular system?

Applying Health Skills

6. **Accessing Information** Different types of safety helmets are used for different physical activities. Using reliable print or online resources, research different types of approved helmets. What kind of helmet would be best to wear while riding a bike? How about when you play football?