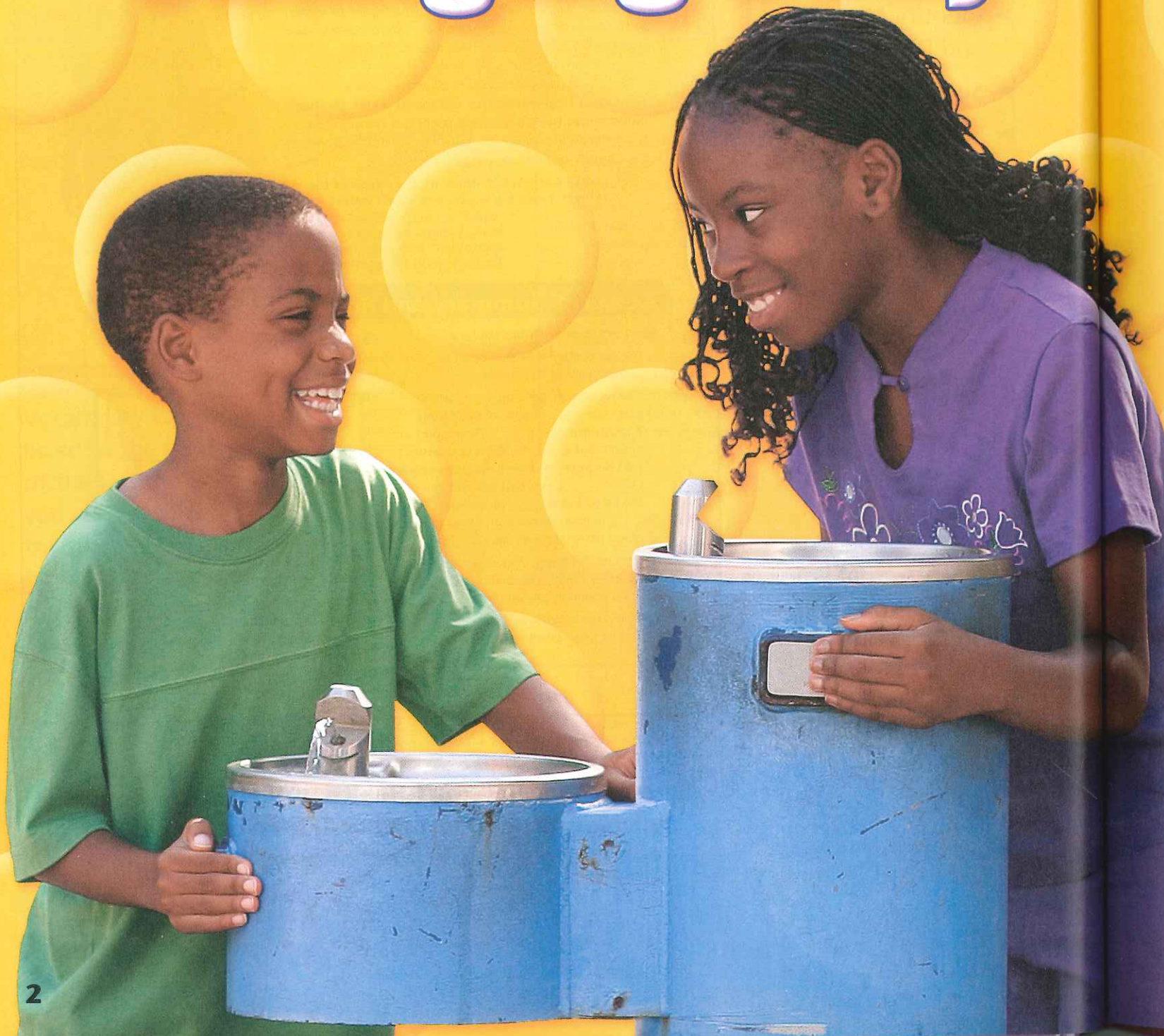
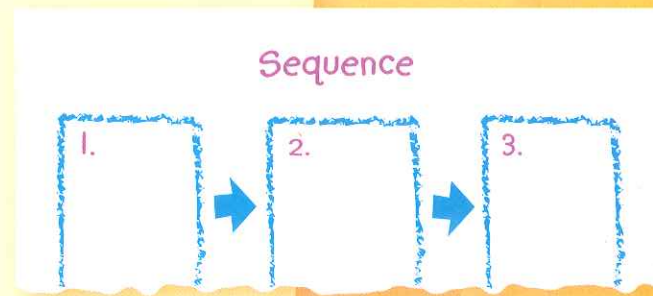


A Growing and Changing Body



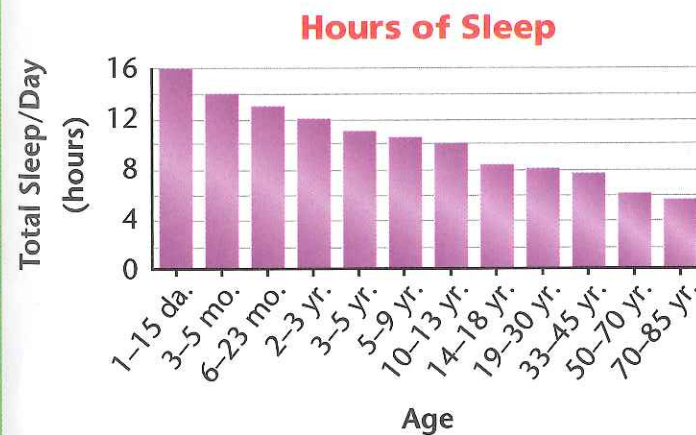
Reading Skill

SEQUENCE When you sequence events, you place them in the order in which they happen. Use the Reading in Health Handbook on pages 372–383 and this graphic organizer to help you read the health facts in this chapter.



Health Graph

INTERPRET DATA Sleep patterns change as people grow older. Infants spend most of their time asleep, sometimes as much as sixteen hours each day. Adults, on the other hand, sleep eight hours or less each day. About how long does a ten-year-old child sleep each day?



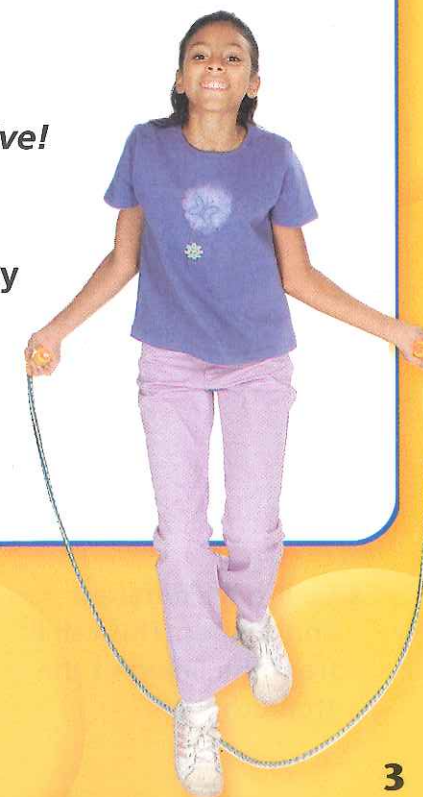
Daily Physical Activity

Regular physical activity helps keep all your body systems working and growing the way they should.



Be Active!

Use the selection, Track 1, Saucy Salsa, to get your whole body moving.



Body Transport Systems

Lesson Focus

Four systems transport materials throughout the body.

Why Learn This?

Understanding how transport systems work together can help you keep them healthy.

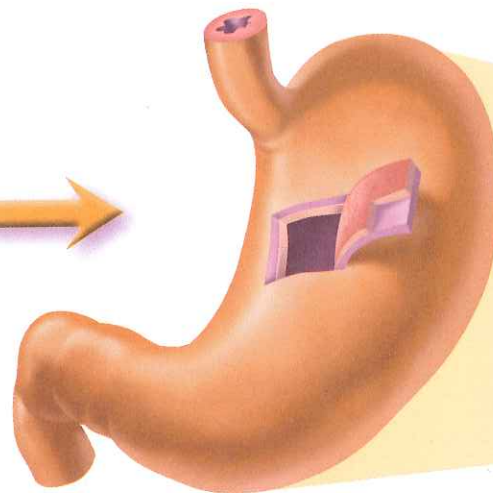
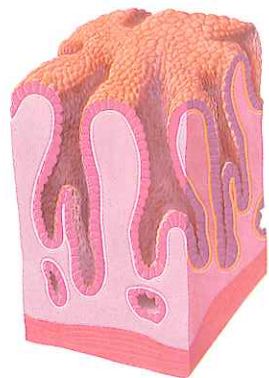
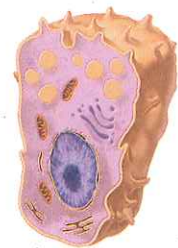
Vocabulary

cell
tissue
organ
system
capillaries
alveoli
nephrons

From Cells to Systems

The basic unit of structure of all living things is the **cell**. Your body is made up of trillions of cells, but they aren't all the same. Different types of cells do different jobs in your body. For example, red blood cells, which are disc-shaped, carry oxygen that other cells need. Muscle cells, which are long and slender, can *contract*, or get shorter. The contracting and relaxing of muscle cells makes your body move.

Cells that look alike and work together make up a **tissue** (TISH•OO). Each kind of tissue works to carry out the jobs of the cells that form it. For example, muscle cells that make up heart tissue don't tire as easily as other muscle cells. This kind of muscle tissue is found only in the heart. Another type of muscle tissue lines the walls of the stomach. This tissue helps digestion.



▲ Cells have different sizes and shapes. This cell is from the lining of the stomach.

▲ One tissue that lines the stomach helps protect the stomach from the strong acid it produces.

▲ Several kinds of tissues make up an organ. The stomach is one of the organs that breaks down the food you eat.

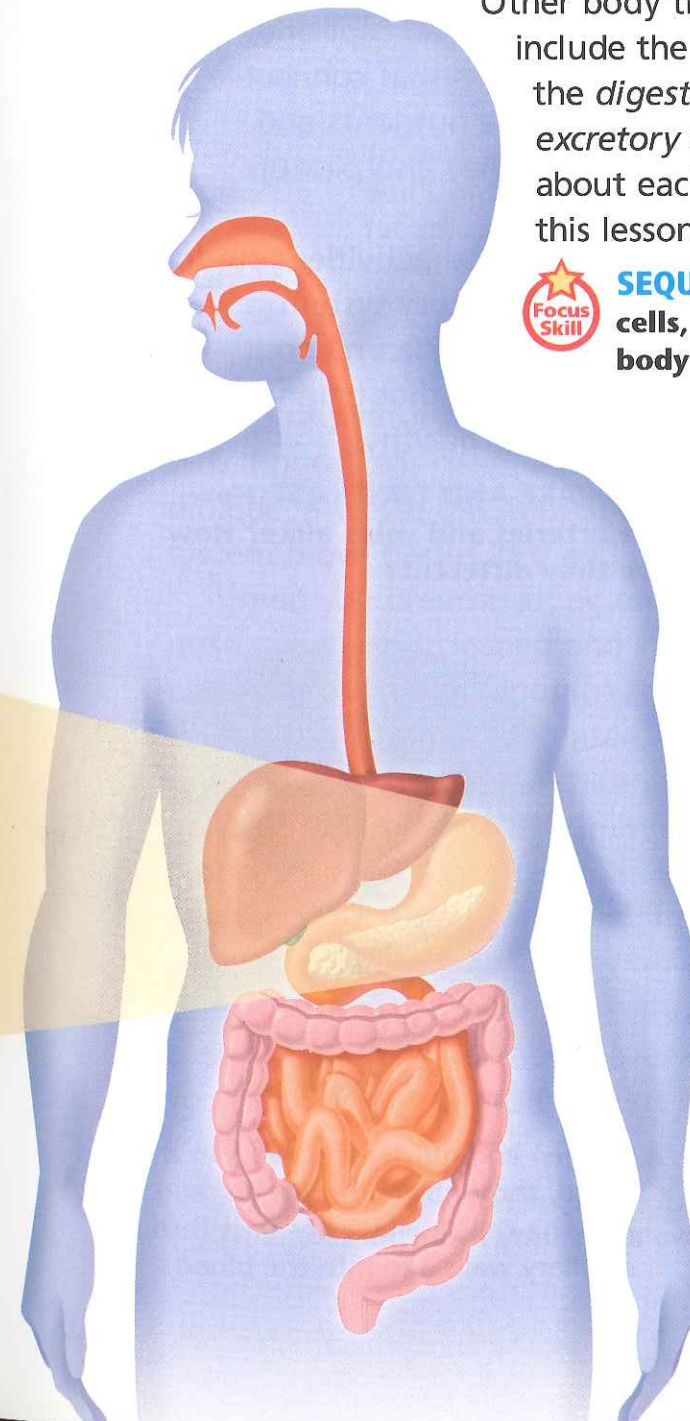
Many body parts are made up of several tissues. A group of tissues that work together to do a job is called an **organ**. The heart is an organ. It is made up of muscle and other tissues. The heart's job is to pump blood to all parts of your body.

Each organ in your body is part of a body system. A **system** is a group of organs that work together to do a job. The heart, for example, can't *transport*, or carry, blood to all parts of the body on its own. To transport blood to all parts of the body, the heart depends on blood vessels, which are also organs. The heart, blood vessels, and blood make up the *circulatory system*.

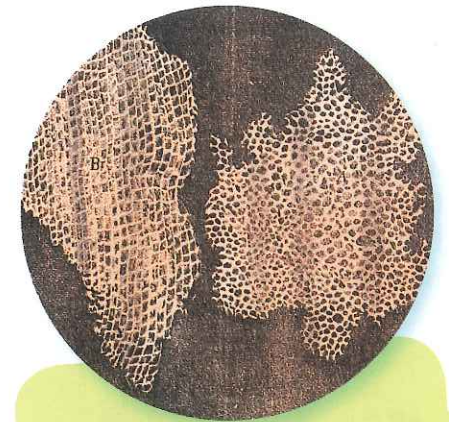
Other body transport systems include the *respiratory system*, the *digestive system*, and the *excretory system*. You will learn about each of these systems in this lesson.



SEQUENCE Beginning with cells, in which order are body systems built?



◀ The stomach is part of a body system that digests food, transfers digested food into the blood, and stores wastes.



Did You Know?

In the mid-seventeenth century, Robert Hooke, a scientist and inventor, coined the term *cell* after he viewed thin slices of cork through a microscope. The boxlike structure of the cork cells reminded Hooke of the cells, or rooms, of a monastery. The photograph above shows cork cells like the ones Hooke observed.

Circulatory System

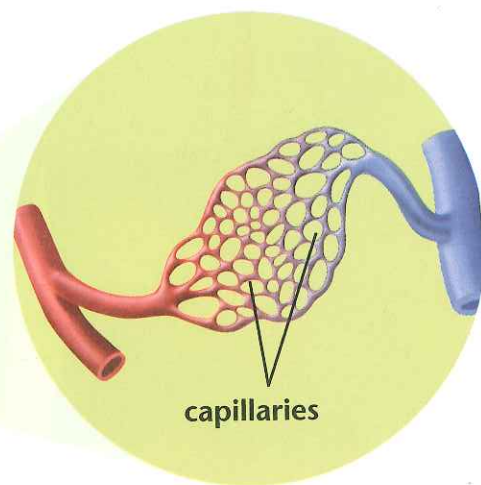
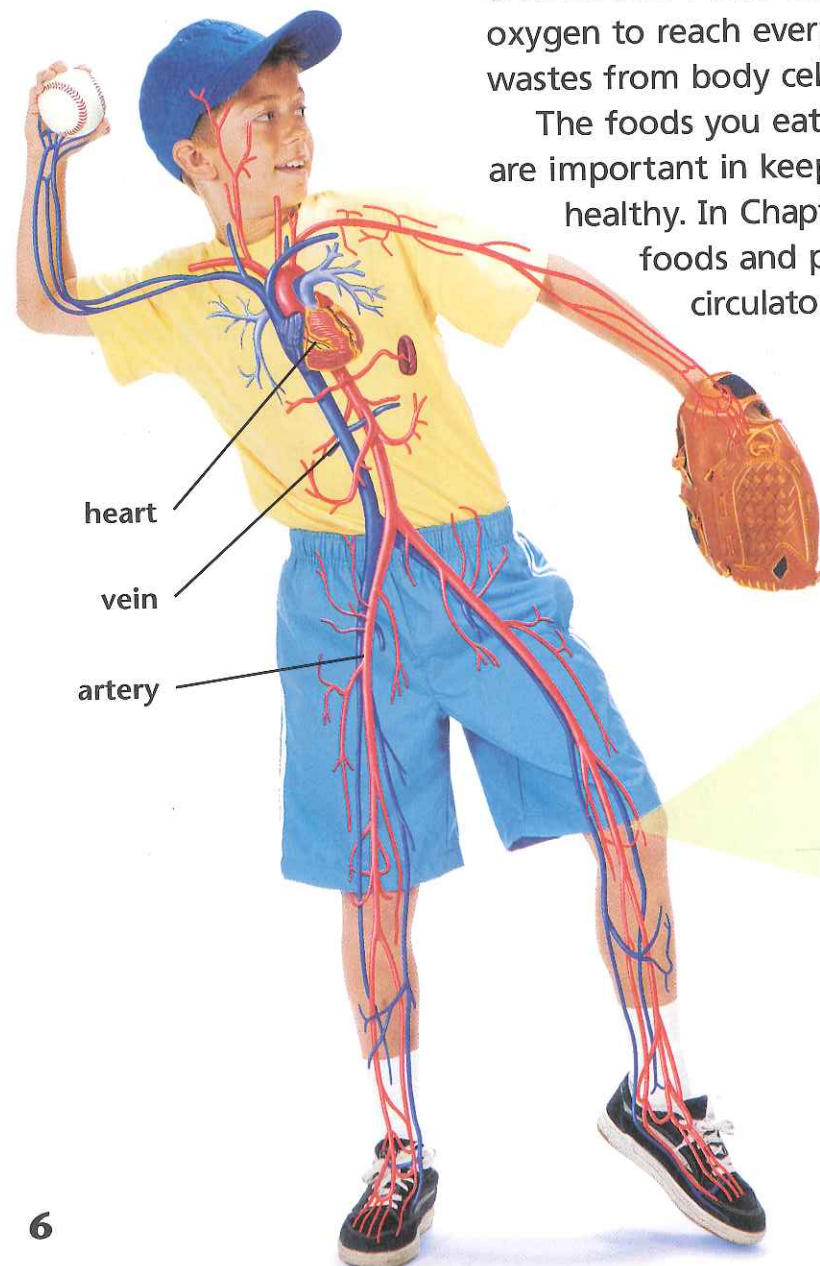
Your body depends on your circulatory system to deliver important materials throughout your body. These materials are carried by blood, which circulates through your body in blood vessels. The circulatory system also helps remove wastes. In other systems, organs such as the lungs and kidneys help the blood get rid of the wastes.

Blood is carried throughout your body by three kinds of blood vessels—arteries, veins, and capillaries. Most arteries carry needed materials, such as oxygen, to body tissues. Most veins carry wastes, such as carbon dioxide, away from body tissues. **Capillaries** (KAP•uh•lair•eez) are tiny blood vessels that connect arteries and veins. Capillaries enable nutrients and oxygen to reach every body cell. They also pick up wastes from body cells.

The foods you eat and the physical activities you do are important in keeping your circulatory system healthy. In Chapters 3 and 4 you'll learn about foods and physical activities that help your circulatory system stay healthy.

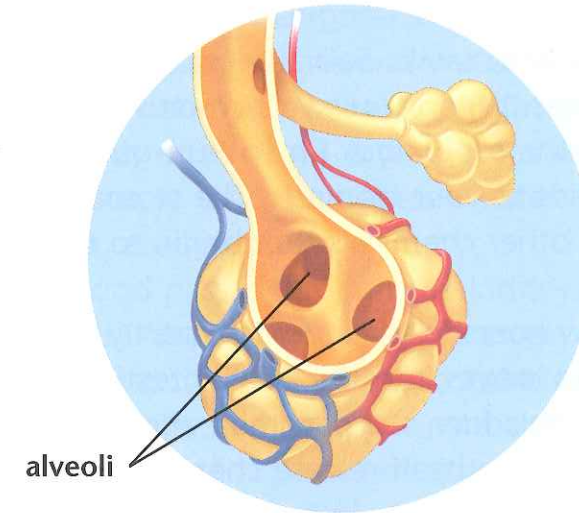
COMPARE AND CONTRAST How are arteries and veins alike? How are they different?

Blood circulates throughout your body in one direction. Your heart provides the force to push the blood. Arteries carry blood away from the heart and to all parts of the body. Veins carry blood from all parts of the body back to the heart. ▼



▲ Oxygen and nutrients pass from the blood, through capillary walls, and into the cells. Cell wastes pass through capillary walls and into the blood.

▼ Oxygen in the air enters the blood through capillaries that surround the alveoli. Carbon dioxide leaves the blood through these capillaries and enters the alveoli.



To keep your respiratory system healthy, don't smoke, and avoid other people's tobacco smoke. Also, avoid air pollutants and get plenty of exercise. ►

Respiratory System

The respiratory system's job is to take in oxygen, which body cells need, and to get rid of carbon dioxide, a waste gas. Muscles help your respiratory system move gasses into and out of your body.

When you breathe in, air enters through your nose, where it is cleaned and warmed. The air then passes through the windpipe, or *trachea* (TRAY•kee•uh). A branch of the trachea enters each lung.

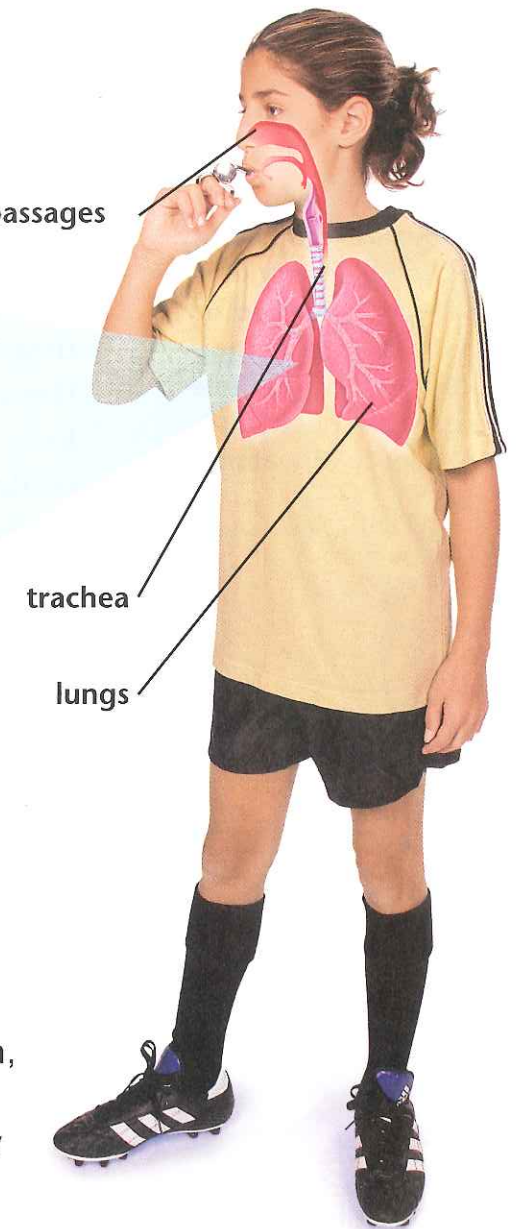
The lungs are the major organs of the respiratory system. They are filled with air tubes, air sacs, and blood vessels. In each lung the air tubes branch again and again. At the ends of the smallest branches are the air sacs, called **alveoli** (al•VEE•uh•ly).

In the alveoli oxygen from the air enters the blood and carbon dioxide leaves the blood. When you breathe out, carbon dioxide is forced out of your body.



SEQUENCE What happens to air right after it enters through your nose or mouth?

nasal passages



Quick Activity

Write an Explanation
Write a paragraph that explains how the circulatory and respiratory systems work together.

Digestive System

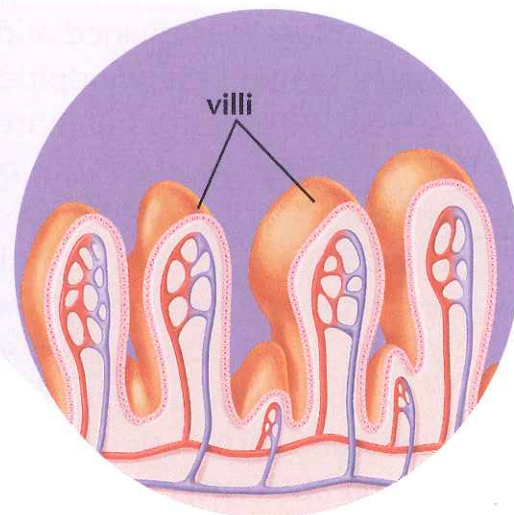
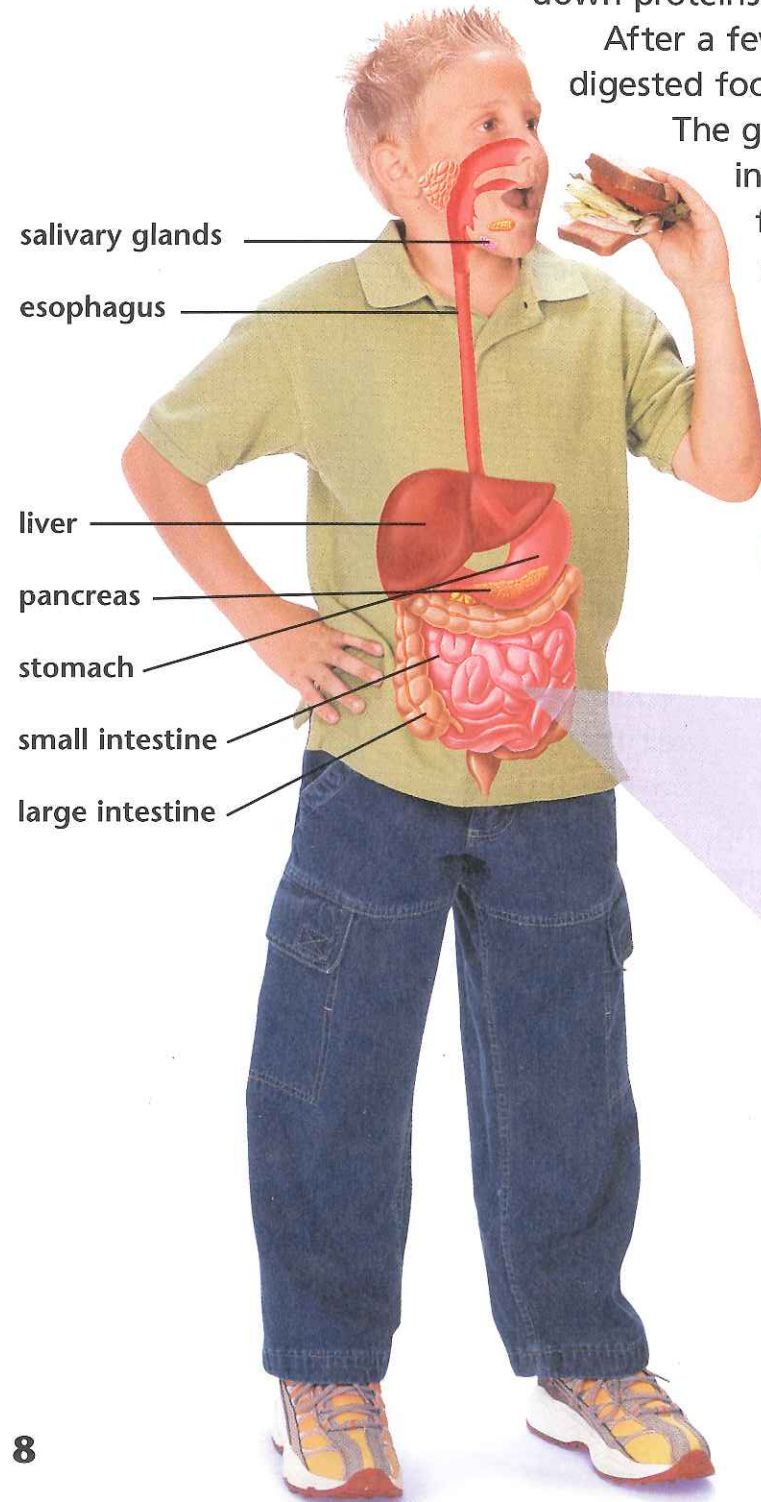
You can help keep your digestive system healthy by eating a variety of low-fat foods, including fruits, vegetables, and foods made with whole grains. You should also drink plenty of water. ▼

The food you eat cannot be used by your body until it is *digested*, or broken down. This is the job of the digestive system. This process begins in your mouth, where food mixes with saliva. Saliva begins breaking down carbohydrates. When you swallow, muscles push the food through the *esophagus* (ih•SAHF•uh•guhs), a long tube that leads to your stomach. The stomach contains acid and other chemicals that begin to break down proteins.

After a few hours in the stomach, partly digested food moves into the small intestine.

The gallbladder, the pancreas, and the small intestine itself release chemicals to finish the job. In the small intestine, materials from digested food move into the blood. Undigested food passes into the large intestine. There, minerals and water move into the blood, and solid wastes are stored temporarily.

SUMMARIZE List the organs of the digestive system, and tell the role of each.



▲ Materials from digested food enter the blood through projections called *villi* in the walls of the small intestine.

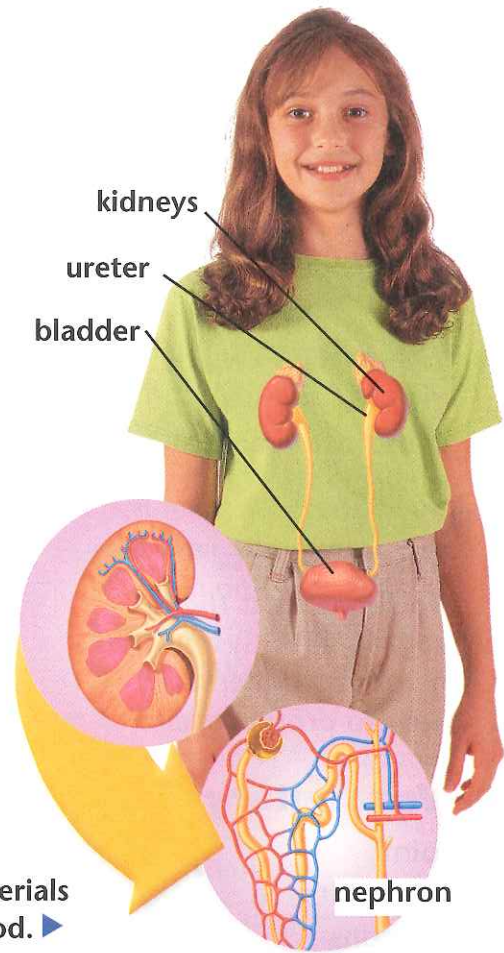
Excretory System

The kidneys and bladder are the major organs of the excretory system. This system takes certain wastes from the blood and removes them from the body as *urine*. Urine is collected wastes and water. This job is important because it keeps the right amount of water in the body at all times. It also helps keep wastes from building up in the body. These wastes, in large amounts, are harmful.

As blood passes through the kidneys, **nephrons** (NEF•rahnz) filter out wastes and excess water. Cleaned blood leaves the kidneys and continues through the body. The urine, which contains the wastes, is stored in the bladder until it passes out of the body.

CAUSE AND EFFECT What are the effects of the kidneys' removing wastes and excess water?

In the kidneys, capillaries pass through microscopic filters called nephrons. Materials the body needs are returned to the blood. ►



Lesson 1 Summary and Review

1 Summarize with Vocabulary

Use vocabulary from this lesson to complete these statements.

Groups of cells make up ____, which make up _____. Groups of these body parts then make up _____. Tiny blood vessels that enable materials and wastes to pass between the blood and body cells are called _____. Gases pass into and out of the blood in the ____ of the lungs. The ____ remove wastes from blood as the blood passes through the kidneys.

2 Critical Thinking

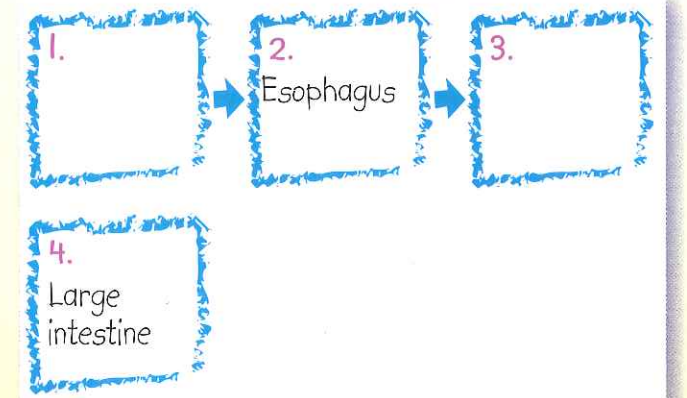
Why do you think the air tubes in the lungs branch again and again until they are very small?

3

Why is the removal of wastes by the kidneys important to the body?

4 Focus Skill SEQUENCE

Draw and complete this graphic organizer to show the order in which organs work to digest food.



5 Write to Inform—Explanation

Write a paragraph that explains why the circulatory, respiratory, digestive, and excretory systems are considered transport systems for the body.

Body Coordination Systems

Lesson Focus

Three body systems coordinate your body's movements.

Why Learn This?

Knowing what the coordination systems do helps you understand how to protect them.

Vocabulary

- joint
- ligaments
- tendons
- neurons
- reflex action

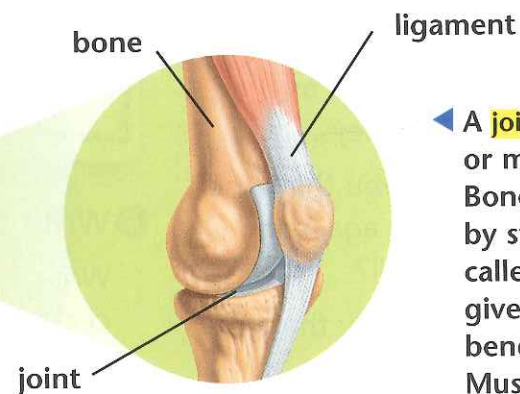
Skeletal System

You probably know that your skeletal system is mostly bone, but did you know it is made of other tissues, too? Your outer ear, the tip of your nose, and the ends of many bones are made of *cartilage*. This tough material is softer and more flexible than bone.

Your skeletal system supports your body. It also protects organs, such as the brain, heart, and lungs. The skeletal system's role in helping you move also makes it one of the body's coordination systems. Even the simplest body movements, such as changing positions in a chair, involve the skeletal system and other body systems.

Physical activity is important to the health of your skeletal system. So is eating foods that contain calcium—which helps build strong bones.

SUMMARIZE List three jobs of the skeletal system.



◀ A **joint** is a place where two or more bones fit together. Bones are attached at joints by strong bands of tissue called **ligaments**. Ligaments give joints flexibility for bending and stretching. Muscles also attach to bones near joints.

An adult's skeleton has 206 bones. ▶

Muscular System

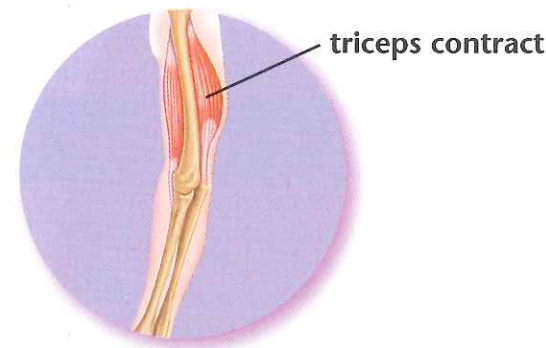
Your skeletal system wouldn't be able to move without your muscular system. The muscles that make your body move are attached to bones. For this reason they are called skeletal muscles. A skeletal muscle has a bulging middle and narrow tendons near each end.

Tendons are strong, flexible bands of tissue that attach muscles to bones near the joints.

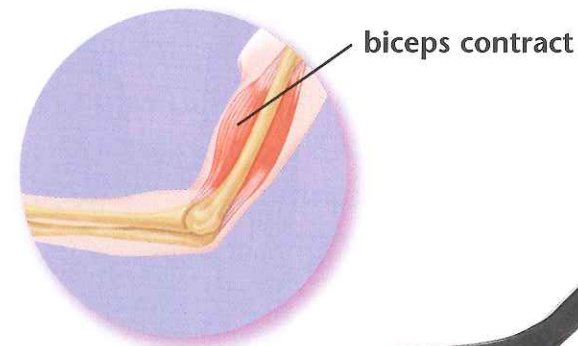
Skeletal muscles work in pairs. When one muscle contracts, it pulls on the bone it's connected to. The bone moves. To move the bone back again, a muscle on the other side of the bone must contract.

You can protect your muscles by warming up and stretching before doing strong physical activity. Be sure to ease out of activity, too, so muscles won't get sore.

CAUSE AND EFFECT What causes a bone to move?



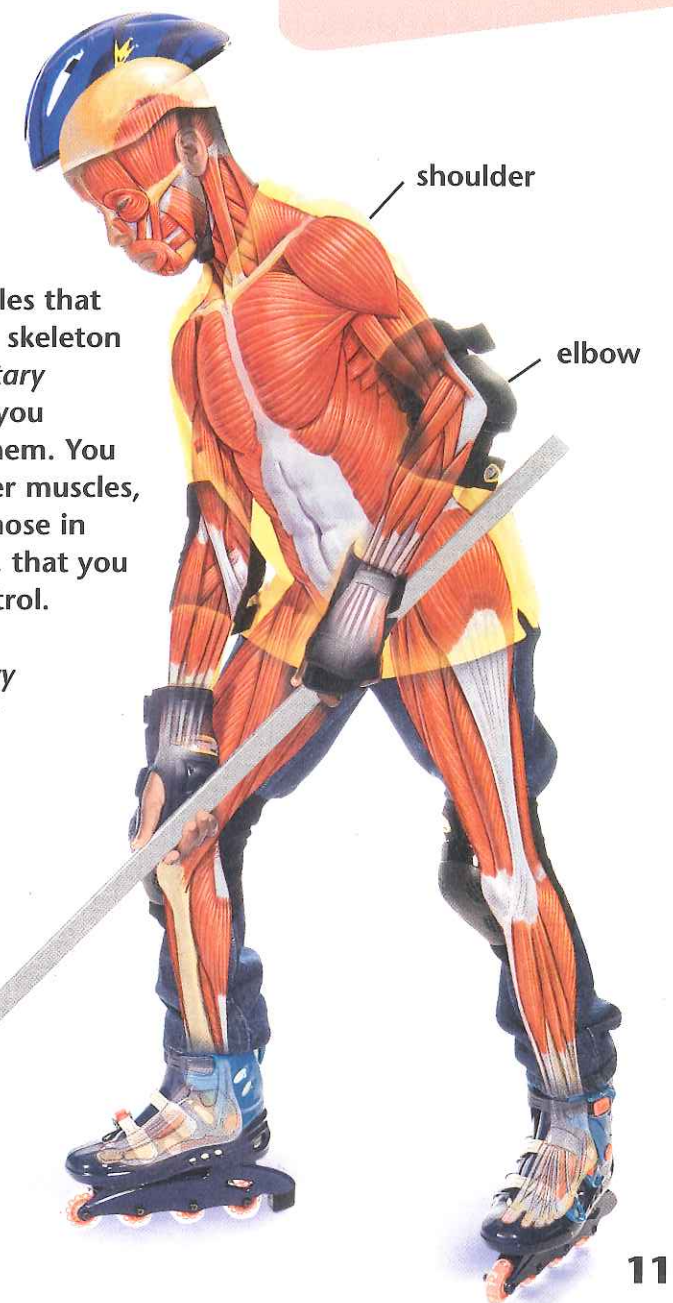
Muscles can pull bones but can't push them. Arm movement requires a pair of muscles—the triceps and the biceps.



The muscles that move the skeleton are *voluntary muscles*—you control them. You have other muscles, such as those in the heart, that you can't control. These are *involuntary muscles*. ▶

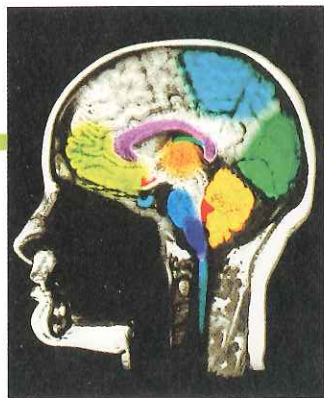
Consumer Activity

Make Buying Decisions
Some advertising suggests you need expensive equipment to exercise. Don't let the lack of equipment stop you. Look for less expensive or used equipment, or choose a different activity. There are many ways to keep physically active.



Health & Technology

Studying the Brain Brain research used to be done on diseased brains. Now, the use of brain imaging has enabled scientists to study healthy brains. As a result, scientists have made many discoveries about the brains of adolescents. For example, scientists have suggested that teenagers may be more emotional than adults because they use a different part of the brain to interpret emotions than adults do.



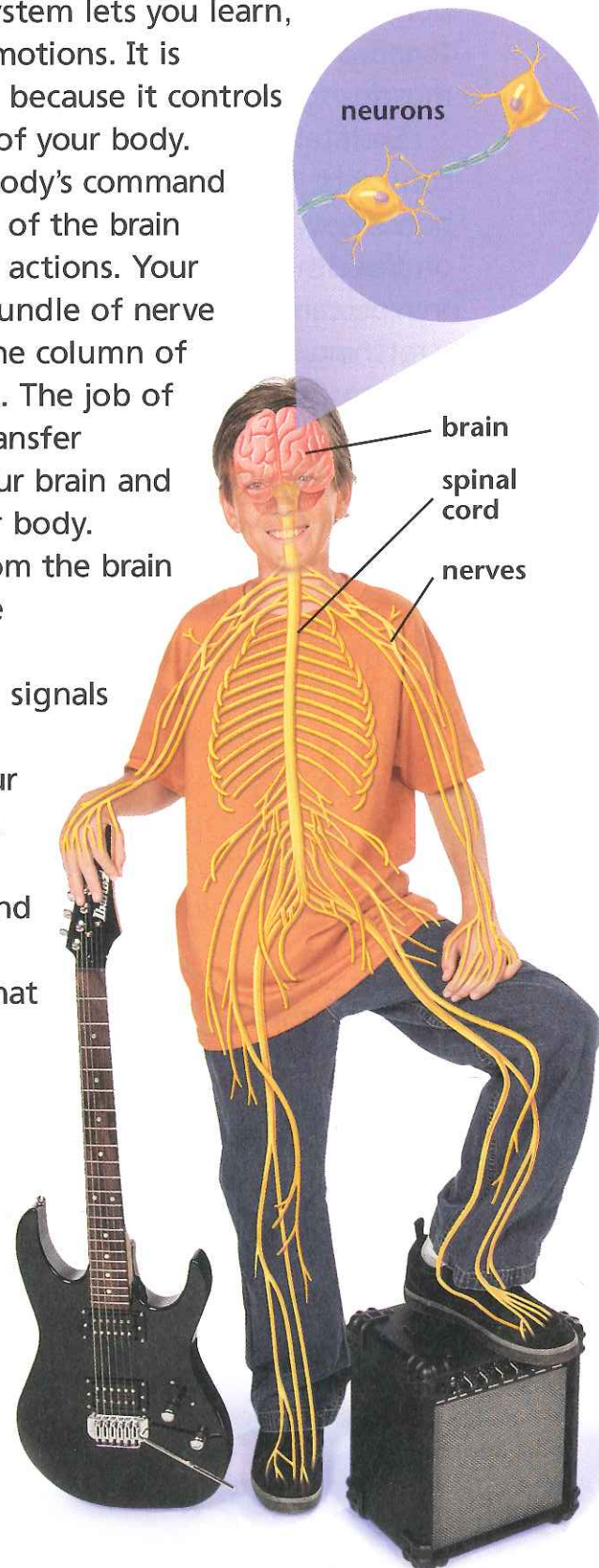
Nervous System

Your nervous system is responsible for your thoughts and your body's movements. It keeps your heart beating and makes sure your lungs take in oxygen. It enables you to see, smell, hear, taste, and touch. Your nervous system lets you learn, remember, and feel emotions. It is important as a system because it controls most of the activities of your body.

Your brain is your body's command center. Different parts of the brain control different body actions. Your spinal cord is a thick bundle of nerve tissue located inside the column of bones along your back. The job of the spinal cord is to transfer messages between your brain and different parts of your body. Nerves that branch from the brain and spinal cord receive information from the environment and send signals to muscles.

Sense organs in your body have nerves that gather information about conditions around you. Your skin, for example, has nerves that sense heat, cold, and pressure. Your eyes detect light, and your

The nervous system includes the brain, spinal cord, and nerves. Nerves are bundles of cells, or **neurons**, which send messages to and receive messages from other neurons. ▶



ears pick up sound waves. Your sense organs provide information to prepare you for most situations.

Most of the time, information from sense organs travels to the brain. The brain receives and analyzes the information. If a response is needed, the brain sends out signals to muscles to take the necessary action.

In some situations, such as the one shown at the right, a response is needed right away. In a case like this, a **reflex action**, or automatic response, involving the spinal cord, but not the brain, may occur.

You can protect your nervous system in several ways. Don't take illegal drugs, and don't take any medicines unless they are given by your doctor or a parent. Eat a variety of healthful foods. Use safety gear when participating in sports.

CAUSE AND EFFECT What causes a muscle to respond?



▶ This girl reacts to the hot pan before she even feels the pain. Nerves in her hand, sensing heat, send a message directly to nerves in her spinal cord that control muscles in her arm and hand.

Lesson 2 Summary and Review

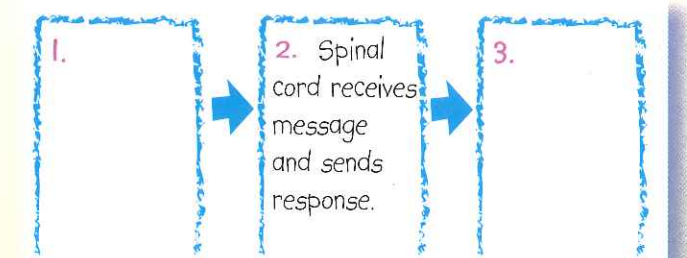
1 Summarize with Vocabulary

Use vocabulary from this lesson to complete these statements.

Bones fit together at _____. Bones are attached to one another by _____. Muscles are attached to bones by _____. Messages from the brain travel to muscles through nerves, which are made up of _____. In an emergency, a _____ may occur to prevent injury.

- 2 How can you keep your skeletal, muscular, and nervous systems healthy?
- 3 **Critical Thinking** Besides the heart, where might involuntary muscle be found?

- 4 **Focus Skill** **SEQUENCE** Draw and complete this graphic organizer to show the order of events in a reflex action that occurs when someone touches a hot pan.



- 5 **Write to Inform—Description**

Write a paragraph that describes how the coordination systems work together when you bend your arm.

LESSON
3

Growth, Heredity, and the Endocrine System

Lesson Focus

Both heredity and environment affect your growth.

Why Learn This?

If you know what affects your body's growth, you can make choices to help your body grow.

Vocabulary

heredity
environment
hormones
glands

Heredity and Environment

Is your hair light or dark? Do you play a musical instrument? Are you good at math? Whatever your traits may be, where did they come from?

Heredity and environment combine to affect who you are and the way you grow. **Heredity** (huh•RED•ih•tee) is the passing of traits from parents to children.

You inherited a set of traits, such as your eye color, hair color, and the shape of your nose. Instructions for these traits are carried in your cells. The combination of traits you inherited from your parents affects the way you look and act.



Your parents give you guidance to help you make good choices. Close ties with family and friends enable you to develop your abilities. This helps you grow as a person.

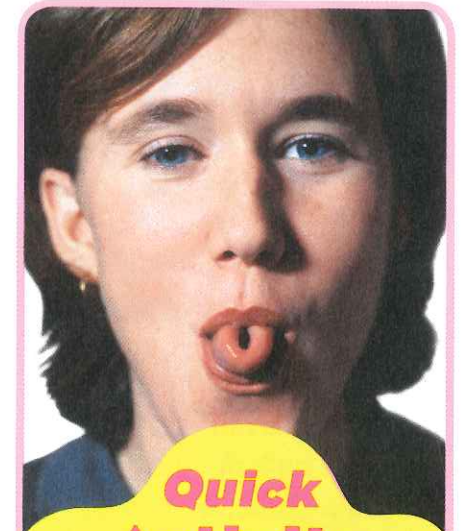
Some inherited traits aren't easily noticed. One of these is the rate at which you grow. No two people grow at exactly the same rate or in the same way.

Your body and some of your talents were determined by your heredity before you were born. However, as you grow, the way your body, talents, and other traits develop also depends on your environment (en•vy•ruhn•muht). The **environment** is all the things that surround you every day.

An environment that is good for growth includes clean air to breathe, clean water to drink, nutritious food to eat, and a safe neighborhood to live in. As you get older, you become more responsible for your environment. Healthful choices, such as avoiding the use of drugs, alcohol, and tobacco, encourage growth and help you stay well.

Your parents gave you your inherited traits. They also do their best to provide you with a healthful environment. You will take on more and more responsibility for your development as you grow. Your parents, other trusted adults, and friends will continue, however, to be an influence.

SUMMARIZE Explain how environment and heredity influence growth.



Quick Activity

Take a Survey Take a survey to determine how many of your classmates can roll their tongues. This trait is passed from parents to their children.



◀ Has anyone ever said you look like someone else in your family? Inherited traits can make family members look very much alike.

Did You Know?

About one in ten young people experience "growing pains" in their legs. The pains usually happen at night, and the aching can wake you up. Fortunately, growing pains normally do not last long and can be helped by massage, heat, or medication.

Endocrine System

Heredity and environment affect your growth, but your body's systems actually make growth happen. One system, the *endocrine system*, is especially important in determining how your body grows. The endocrine system sends messages in the form of chemicals throughout your body. The chemicals, called **hormones** (HAWR•mohnz), travel in your blood to the organs and tissues of your body systems.

Hormones are produced by **glands**, or groups of specialized cells. Each gland has certain organs, or target organs, that its hormones act on. The whole endocrine system has many glands. The diagram below shows the locations and roles of several of the body's endocrine glands.

1 The pituitary gland (pih•TOO•uh•tair•ee) controls growth. The pituitary is sometimes called the master gland because it makes hormones that control other glands.

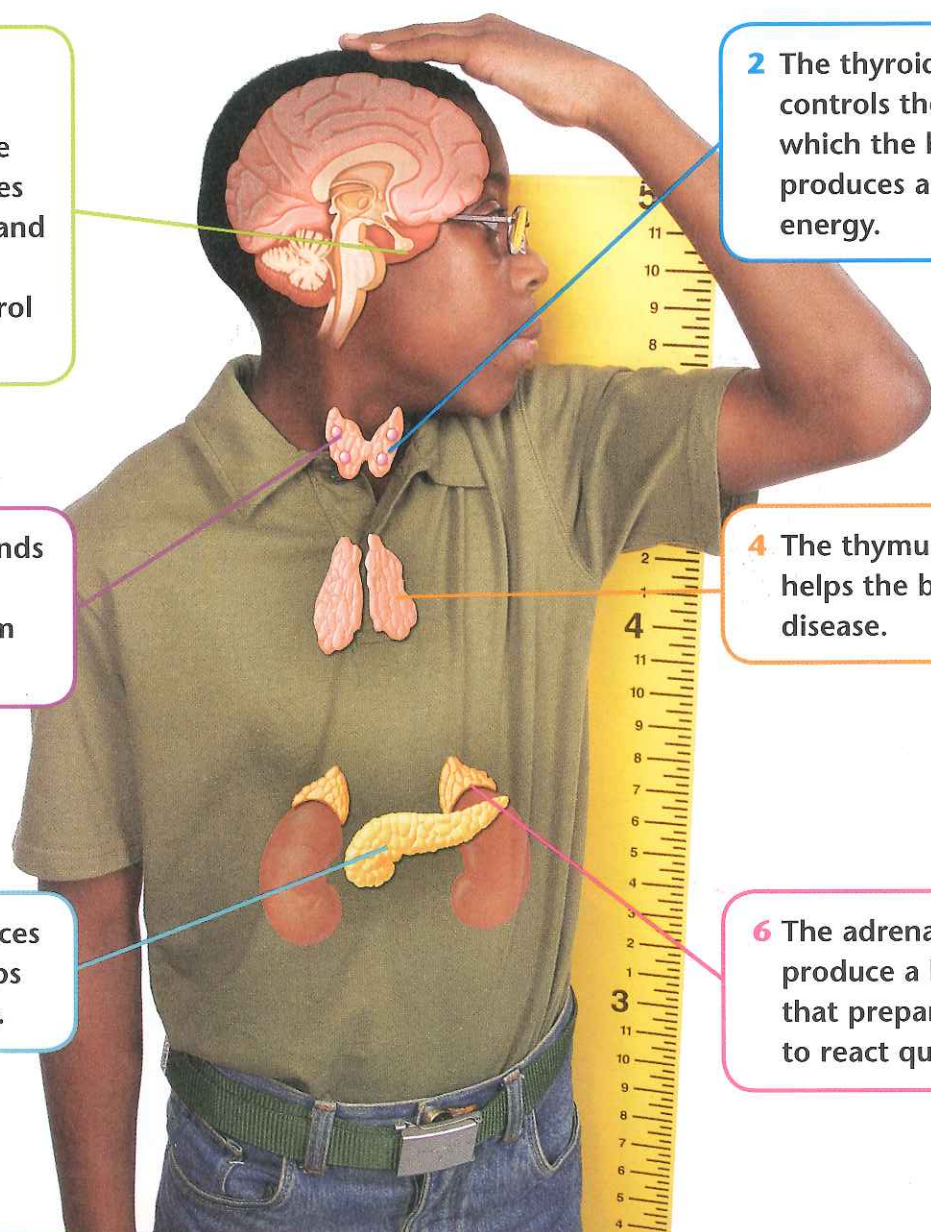
2 The thyroid gland controls the rate at which the body produces and uses energy.

3 The parathyroid glands help regulate the body's use of calcium and vitamin D.

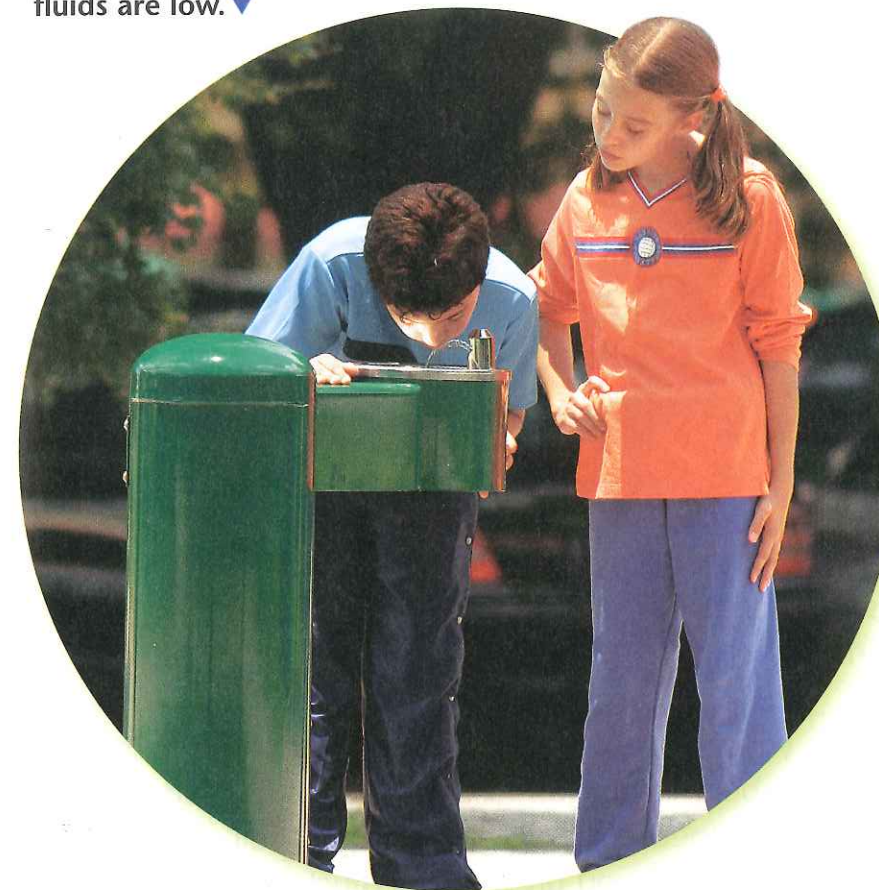
4 The thymus gland helps the body fight disease.

5 The pancreas produces a hormone that helps body cells use sugar.

6 The adrenal glands produce a hormone that prepares the body to react quickly.



Hormones cause you to feel thirsty if your body fluids are low. ▼



Most glands make and release several different hormones. Every body function controlled by the endocrine system is controlled by more than one hormone. Hormones work together. If the level of one hormone is too high or too low, the level of another hormone changes to fix the problem.

Several hormones affect body growth. Growth hormone, which is produced by the pituitary gland, controls how much and how fast you grow. It affects the growth of your bones and skeletal muscles. Growth hormone causes the rapid growth that many teenagers experience. Other hormones aid in growth, too.

CAUSE AND EFFECT What effects do the pituitary, parathyroid, thymus, and thyroid glands have on the body?

Hormones

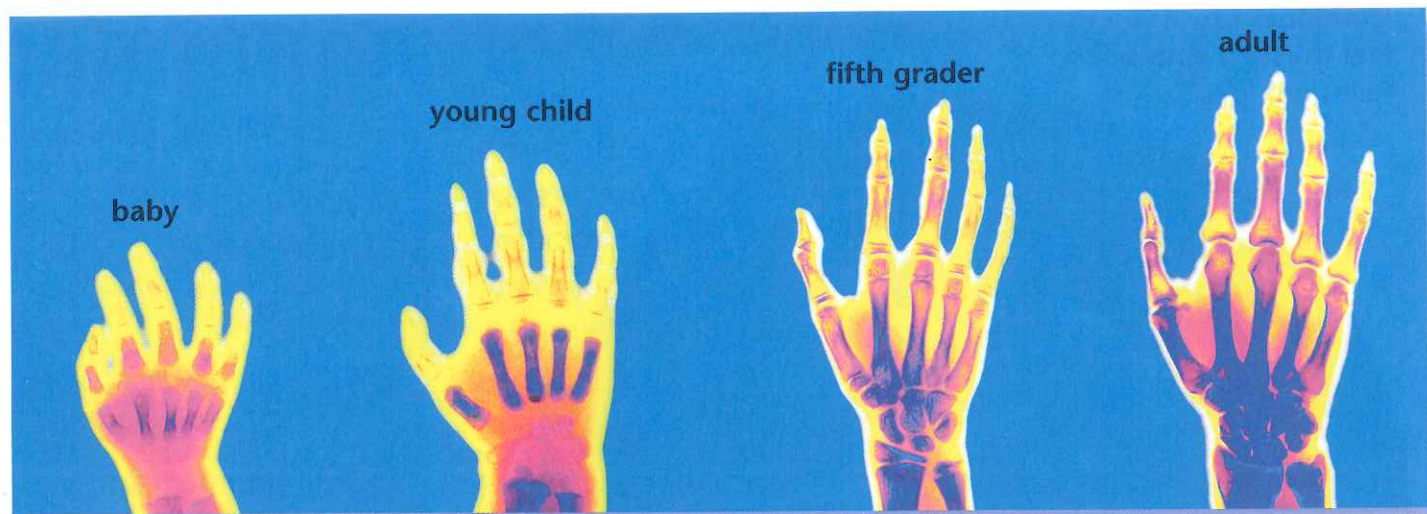
- 1 prepare you to react quickly for your own safety when you are frightened.
- 2 keep your body working steadily while you rest.
- 3 help your body use nutrients.
- 4 determine your body's rate of growth.



Myth and Fact

Myth: Sports drinks are better than water if you are really thirsty.

Fact: Water is just as good as sports drinks for people who are really thirsty. Sports drinks may be better, however, for people who exercise for long periods, such as long-distance runners.

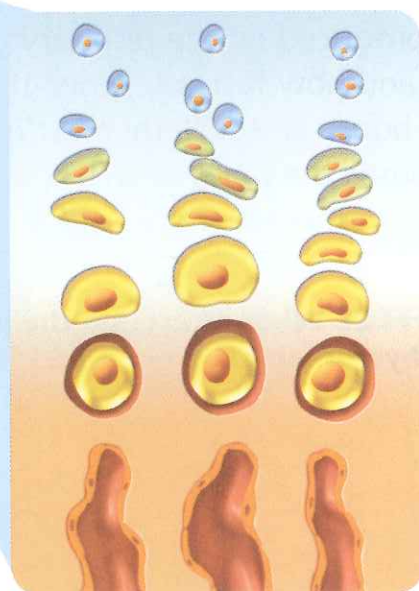


▲ These X rays show the hands of a baby, a young child, a fifth grader, and an adult. Notice how the bones of the hand change from one period of life to the next.

How Growth Occurs

You may think of your bones as hard, dry, dead body parts, but less than half of a bone contains hard material. About one-fourth is water. The rest is living tissue.

When you were a baby, your bones contained a lot of soft, rubbery cartilage. Cartilage bends instead of breaking. It helped protect you when you fell as you learned to walk. As you grew older, much of the cartilage hardened into bone. By the time you are twenty-five years old, your bones will be fully developed. Cartilage will remain only in places such as your knees and elbows. In these places cartilage works like a cushion so your bones can easily move against one another.



◀ Growth occurs at a bone's growth plates. In adults, growth plates are replaced with ordinary bone tissue. This change causes bone growth to stop.

Until you become an adult, your bones grow by making new cells. New cells increase the length and thickness of your bones. When you are a teenager, your bones will grow rapidly. They may grow several inches in a year's time.

Your muscles, too, grow in length and thickness. Like bones, your muscles stop getting longer after you become an adult. However, physical activity can make your muscles grow thicker and stronger. Physical activity will remain important for your muscles and bones even after you have finished growing. Throughout adulthood you will need to stay active to keep your muscles strong. The changes in your bones and muscles as they grow over the next few years will enable you to do more physical activities.

COMPARE AND CONTRAST Compare the growth of bones to the growth of muscles.



▲ The exercise this firefighter gets will tire his muscles. When he rests, his muscles will use materials from food for repair.

Lesson 3 Summary and Review

1 Summarize with Vocabulary

Use vocabulary and other terms from this lesson to complete these statements.

Both _____ and _____ affect the way you grow. The body system most responsible for your growth, however, is the _____. In this system, _____, or groups of specialized cells, produce _____ that cause changes in the tissues of the body. During growth, _____ changes to bone.

2 What substances should you stay away from to help keep your body healthy?

3 **Critical Thinking** How does the function of cartilage in a baby differ from its function in an adult?

4 **FOCUS SKILL** **SEQUENCE** Draw and complete this graphic organizer to show how the endocrine system sends a message to a target organ.



5 **Write to Inform—Explanation** Write a paragraph that explains why it is important to continue exercising throughout life.

Growth Comes in Stages

Lesson Focus

You go through several stages of growth during your lifetime.

Why Learn This?

Learning about the stages of growth will help you prepare for changes ahead.

Vocabulary

- prenatal
- growth spurt
- puberty
- body image

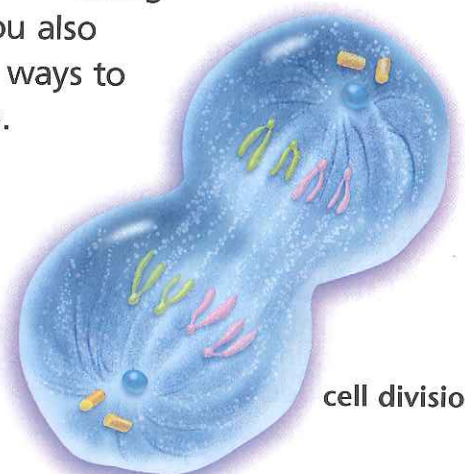
During the prenatal stage, new kinds of cells form and divide over and over again. From a tiny cell no bigger than the period at the end of this sentence, you grew into a baby. ▶

Growth Changes You

Imagine increasing your weight more than two billion times! That's just what you did in the nine months before you were born. You began growing inside your mother's body as a tiny single cell. During the **prenatal** (pree•NAYT•uhl) stage, or the time before birth, the single fertilized cell divided rapidly to form many new cells. These cells developed into different types of cells with different purposes. Your major body organs formed. By the time of your birth, your heart, lungs, stomach, and other organs were working together in systems. You could now live outside your mother's body.

In the prenatal stage, you went through a period of rapid growth, called a **growth spurt**. You went through a similar period during *infancy*, or babyhood. That growth spurt began the day you were born.

Throughout infancy, your appearance changed and so did the things you were able to do. At first, you depended on your parents for survival. During your first year, your brain, muscles, and bones grew quickly. Your increased strength made sitting, crawling, and walking possible. You also learned new ways to communicate.



cell division

How You've Grown

Growth Stage	Age	Characteristics
Prenatal	Before birth	You grow faster than at any other period in your life. While inside your mother's body, you develop all the body parts you need.
Infancy	Birth to two years	Your body becomes bigger and stronger. You change from an infant into a toddler who can sit up, crawl, walk, and talk.
Childhood	Two years to ten years	Growth is slow but constant. You get taller, stronger, and more coordinated. Your mental, emotional, and social abilities develop. You also develop better problem-solving and communication skills.



▲ Every child grows at his or her own rate.

In time you began to think problems through and do things that you couldn't do before. Infancy prepared you for the next growth stage—childhood. During childhood, your body and mind developed even more. As you grew taller, stronger, and more coordinated, you were able to do things such as dance and twirl, play games and sports, and type on a computer keyboard.

Mental, emotional, and social changes also occurred during childhood. You learned to read. You discovered new interests and skills in a variety of areas. You learned to write and do math. These skills help you communicate with other people. Also during childhood, you began to develop friendships, and you became involved in many kinds of social activities.

MAIN IDEA AND DETAILS The growth stages on the chart above are three main ideas. List two details for each main idea.

Information Alert!

Research on Human Growth As scientists develop new techniques for studying the human body, they learn more about changes that happen during each stage of growth.



For the most up-to-date information, visit The Learning Site. www.harcourtschool.com/health

ACTIVITY



Building Good Character

Caring A person who feels that he or she is too far ahead or too far behind in growth may feel awkward and shy in group activities. Name at least two things you could do to help such a person feel at ease in your group.

You Continue to Grow

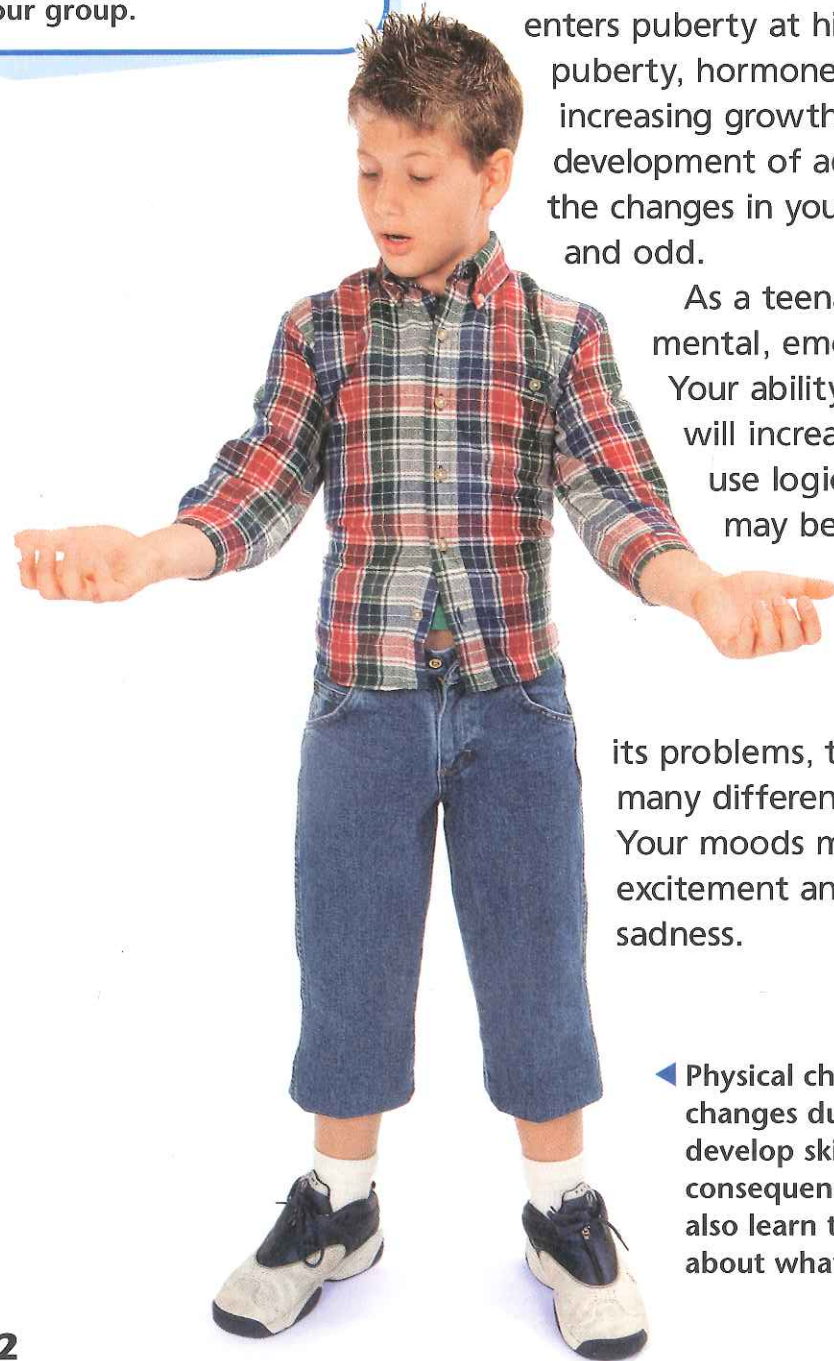
Like the boy in the picture, you may have noticed that some of your clothes are suddenly too small. Your body is getting ready to enter the next and final growth spurt of your life. The period of rapid growth and development from about age ten to age nineteen is called *adolescence* (ad·uh·LES·uhnts). You enter this period as a child and leave it as an adult.

The physical changing a person experiences during adolescence is called **puberty** (PYOO·ber·tee). Puberty can begin in girls as young as eight years of age and in boys as young as ten years of age. However, everyone enters puberty at his or her own time. During puberty, hormones affect the body not only by increasing growth but also by causing the development of adult characteristics. Some of the changes in your body may seem unfamiliar and odd.

As a teenager, you will also experience mental, emotional, and social growth. Your ability to think and solve problems will increase. You will be better able to use logic and reasoning. Your feelings may become stronger than they were before. Relationships with other people will become more important.

Adolescence is not without its problems, though. You may experience many different *moods*, or general feelings. Your moods may change quickly from great excitement and happiness to anger and sadness.

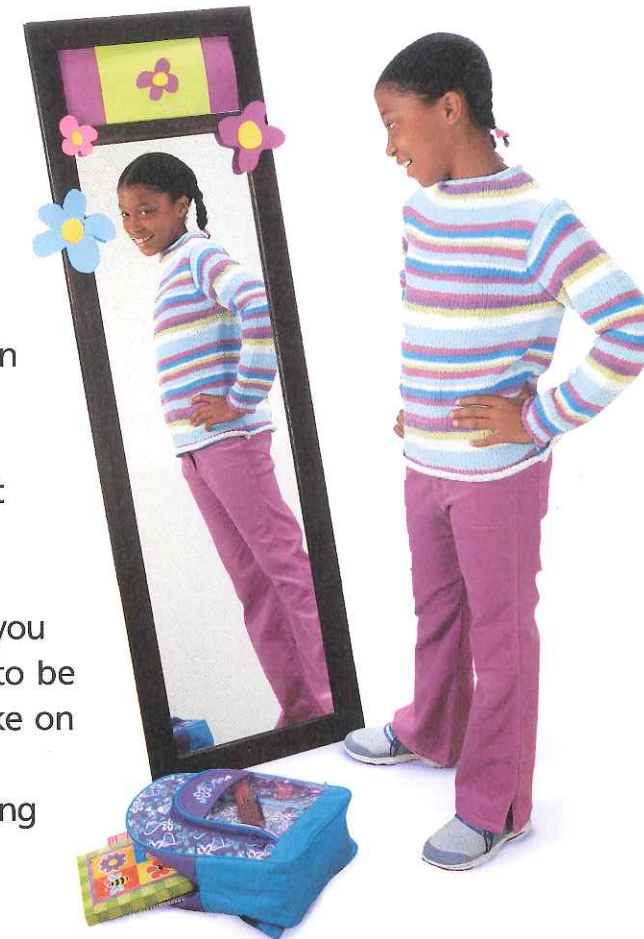
◀ Physical changes aren't the only changes during adolescence. You'll develop skills to help you deal with the consequences of your actions. You'll also learn to make better decisions about what is right and wrong.



Sometimes, feelings during adolescence are affected by physical changes. When people change physically, they may compare themselves with others. They may think of themselves as too tall, too short, too thin, or too heavy—even if they aren't. Such people have an unrealistic body image of themselves. **Body image** is how you think your body looks. People who develop an unrealistic body image may also feel low in self-esteem. They may become shy or try to change their looks by dieting or changing their hair. Most teenagers overcome an unrealistic body image as they get older.

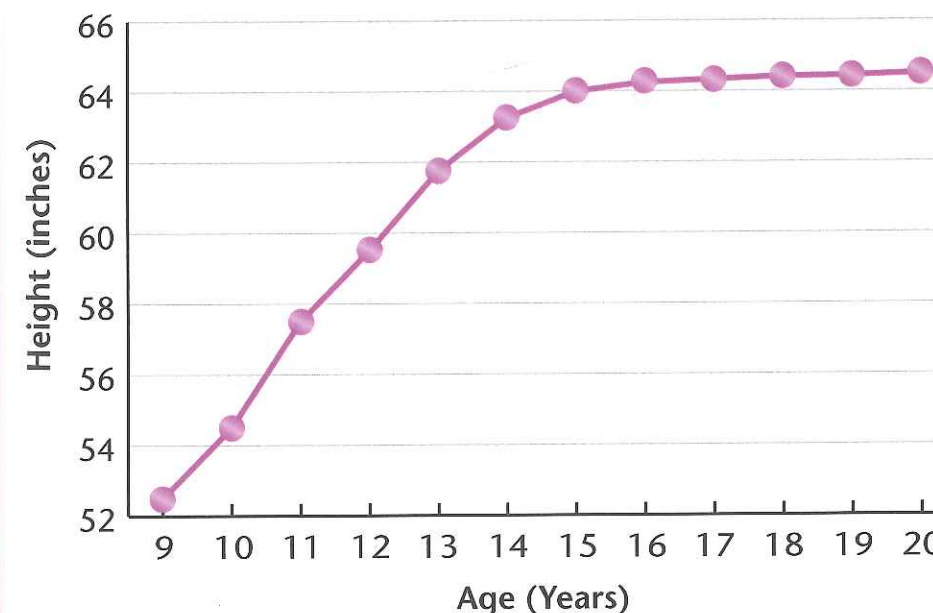
The physical, mental, and emotional changes you experience during adolescence help prepare you to be an adult. During adolescence you will learn to take on more responsibilities, and you will earn more privileges. Adolescence is sometimes called "coming of age." You grow up and become more independent.

MAIN IDEA AND DETAILS Describe adolescence, and identify the three types of growth people experience during this stage.



▲ Kesha likes the way she looks in a mirror. Her ideals aren't based on movie and TV stars, but on real people.

Growth



Quick Activity

Graphing Growth
This graph shows the growth of one person during adolescence. Start a similar growth chart to track changes in your own growth. If you keep track on a monthly basis, you may be amazed at how quickly you grow.

Becoming an Adult

Although you won't experience physical growth spurts after puberty, you will continue to grow emotionally, mentally, and socially. Entering adulthood, you'll probably continue your education, choose a career, and begin to support yourself financially. You'll develop close personal relationships. You may marry, have children, and take the responsibility of providing a healthful family environment.

As an older adult, you will change physically again. Some of your physical abilities will decline. However, you can help yourself stay healthy and active as an older adult by practicing good habits during all stages of your life. These habits include being physically active; eating healthful foods; getting plenty of rest; and avoiding alcohol, tobacco, and illegal drugs.

CAUSE AND EFFECT What is the effect of practicing healthful habits during all stages of your life?

▲ As you approach adulthood, you'll change less physically, but you'll "grow" in other ways.



Lesson 4 Summary and Review

1 Summarize with Vocabulary

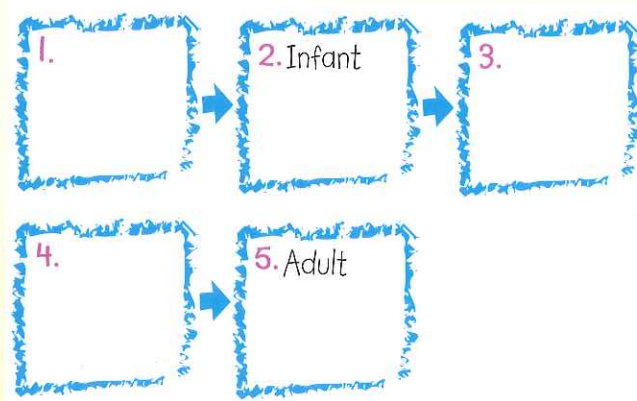
Use vocabulary and other terms from this lesson to complete these statements.

During the ____ stage, before birth, there is a(n) ____, or time of rapid growth. The stage after childhood is _____. You experience _____, the physical changing that makes you develop into an adult. Some people have a problem with changes in their appearance and develop an unrealistic _____.

2 What kinds of problems do adolescents sometimes experience?

3 **Critical Thinking** What are some ways a person becomes more independent at each life stage?

4 **Focus Skill** **SEQUENCE** Draw and complete this graphic organizer to show the order of growth stages.



5 **Write to Inform—Explanation**

Write a paragraph that explains the similarities and differences between the prenatal stage and infancy.

Trustworthiness

Building Good
Character

Building a Good Reputation

On the road to becoming an adult, there will be times when your character may be tested. For example, a test of your trustworthiness could be having the honesty to return something valuable that you have found. Making choices that show that you have good character can help you build a good reputation. Here are some tips for building a reputation of trustworthiness.

- **Have the courage to do what is right.**
- **Be honorable.**
- **Live by your principles, no matter what others say.**
- **Follow your conscience.**
- **Always tell the truth.**
- **Be sincere.**
- **Keep your promises.**
- **Be dependable.**
- **Return what you borrow.**
- **Be on time.**
- **Don't repeat gossip or say bad things about others.**

Activity

Make a character map about trust. Write the word *trust* in a circle at the center of a sheet of paper. In each corner of the paper, draw a large box connected to the circle by a line. During one day, take note of all the things you do that show that you can be trusted. Select four of those things, and describe them in the boxes of your map.



LESSON
5

Dealing with Adolescence

Lesson Focus

Physical, mental, and emotional changes accompany the growth spurt during puberty.

Why Learn This?

Knowing about the different kinds of changes during puberty will help you appreciate your own growth and development.

Vocabulary

concrete thinking
abstract thinking

Learning New Skills

It's easy to see how your growth spurt during puberty affects you physically. What isn't as easy to see is how it affects you mentally and emotionally.

During adolescence, new cells that are produced and the actions of hormones increase your ability to reason, solve problems, imagine, and invent. You add new thoughts, dreams, and opinions to what you already know. You may find that your interests change often. For the first time, you may become interested in different kinds of music, a team sport, or new hobbies.

Your new interests open doors to new friends, new activities, and new ideas. By following your interests, you add further to your abilities and knowledge. At this stage you are able to understand the value of practice in sports, schoolwork, and music. As your skills increase through practice, so does your self-confidence.

Quick Activity

Listing Interests

Make a list of all the things you did for the first time this year. Include new hobbies, skills, and interests. Then list three new things you might like to try in the next year.

As you enter puberty, you'll notice your mental growth as you discover new ways to accomplish tasks.



When you were younger, you were able to solve problems only by using things around you. For example, you could fit shapes together in a jigsaw puzzle, and you enjoyed sorting blocks by color and size. Solving problems involving real objects that you can see and touch is called **concrete thinking**.

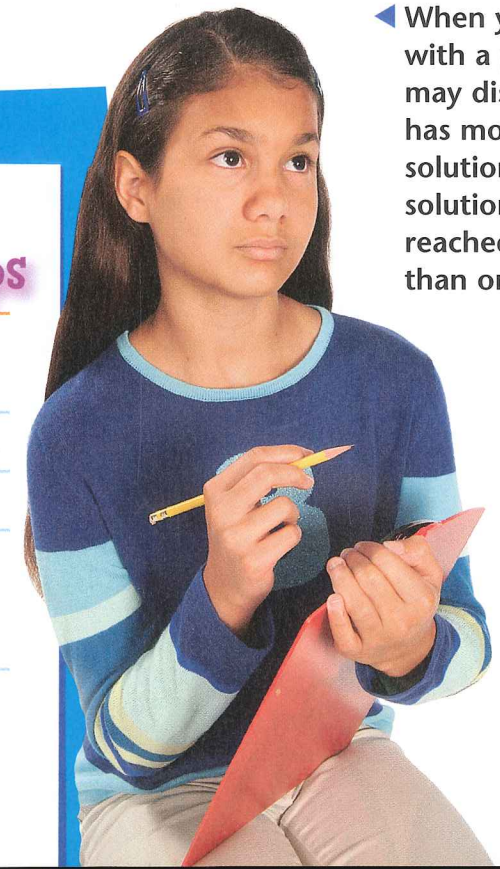
Over the years, your thinking abilities have changed. You've learned ways to analyze and solve more complicated problems. Now you are able to use a more complex kind of thinking, called **abstract thinking**. With abstract thinking, you are able to imagine different solutions to problems.

Your thinking abilities will continue to develop as you enter puberty. You will become even better at identifying problems, thinking about possible solutions, and testing those solutions in your own mind. Using this abstract-thinking process, you will be able to handle even harder problems and learn to share your opinions and ideas with others.

COMPARE AND CONTRAST How are your present thinking abilities similar to and different from those of a young child?

Problem-Solving Steps

- 1 Identify the problem and state it to yourself.
- 2 Brainstorm many possible solutions.
- 3 Choose the best solution.
- 4 Test the solution in your mind by thinking about what might happen if you try it.



◀ When you are faced with a problem, you may discover that it has more than one solution and that a solution can be reached in more than one way.

ACTIVITY



Life Skills

Communicate

Although she hasn't said anything yet, Sakari is upset about her sister's using her music player without asking. Now her sister has accidentally erased Sakari's favorite song. What "I" message could Sakari use to explain her feelings to her sister? An "I" message is a statement you make in which you use the word *I* to clearly explain your feelings about something.

Personal Health Plan

Real-Life Situation

Think of some decisions you made in the past year. Consider how you made each one and if you were satisfied with the results.

Real-Life Plan

Choose one decision that didn't turn out well. Identify some ways to improve the way you make similar decisions in the future.

Handling Feelings and Problems

The road to maturity is exciting, but at times it can be scary. As you grow up, you will have feelings and experiences you've never had before. You will also have important decisions to make and new problems to solve.

At this time of your life, you may be dealing with some personal problems. You may question who your friends are and what kinds of friends you want to have. You may want more independence from your family. New responsibilities may challenge you. Solving personal problems can require a great deal of effort and attention.

During adolescence you will learn how to reason through problems. You will learn that you have many options and that your choices bring both responsibilities and consequences. You will learn to make decisions after carefully weighing several possible outcomes.

As you travel toward adulthood, you will come across many challenges. Some will be like obstacles to get over or around. Other challenges will be rewarding and will be proof of your progress.

Adolescence is also a time when many people develop strong emotions and opinions. You may have mood swings, in which your mood changes often and quickly. You may feel happy one moment and sad the next, and your feelings may be stronger than ever before. As you learn to manage your emotional changes, you will need time to be alone with your thoughts. Talking about your feelings and problems with a parent or other trusted adult can also be helpful.

DRAW CONCLUSIONS Which events will likely be problems to overcome on your way to adulthood?

Lesson 5 Summary and Review

1 Summarize with Vocabulary

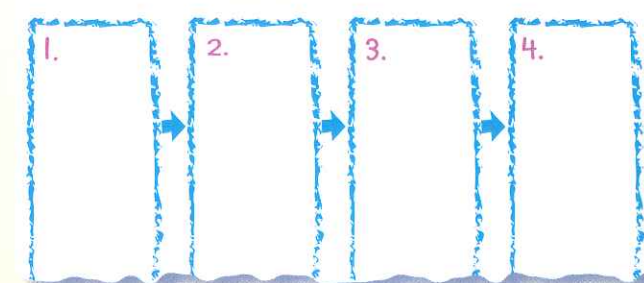
Use vocabulary and other terms from this lesson to complete the statements.

When you were younger, you used _____ thinking to solve problems involving real objects you could see and touch. Now you also can use _____ thinking, which helps you see many options during decision making. During adolescence you may experience _____, in which your moods change often and quickly.

2 Critical Thinking Do you use concrete thinking or abstract thinking when you decide whether to wear a coat to school?

3 How can the road to adulthood be both difficult and rewarding?

4 Focus Skill SEQUENCE Draw and complete this graphic organizer to show how to apply the steps for solving a problem.



5 Write to Entertain—Short Story

Write a short story titled "A Day in the Life of a Teenager." In your story, describe how your main character learns to handle a problem.



Resolve Conflicts

with Your Family About Becoming Independent

During adolescence you will start to make decisions for yourself. Some of your decisions may cause conflicts with parents because they are still responsible for your well-being. Using the steps for **Resolving Conflicts** can help you work out disagreements.

Cody's friends plan to go to a movie on a school night. Cody wants to go, too. His mother reminds him that school nights are for homework. What should Cody do?

1 Use "I" messages to tell how you feel.



Cody knows that school nights are supposed to be for studying, but he wants to join his friends.

2 Listen to the other person. Consider that person's point of view.



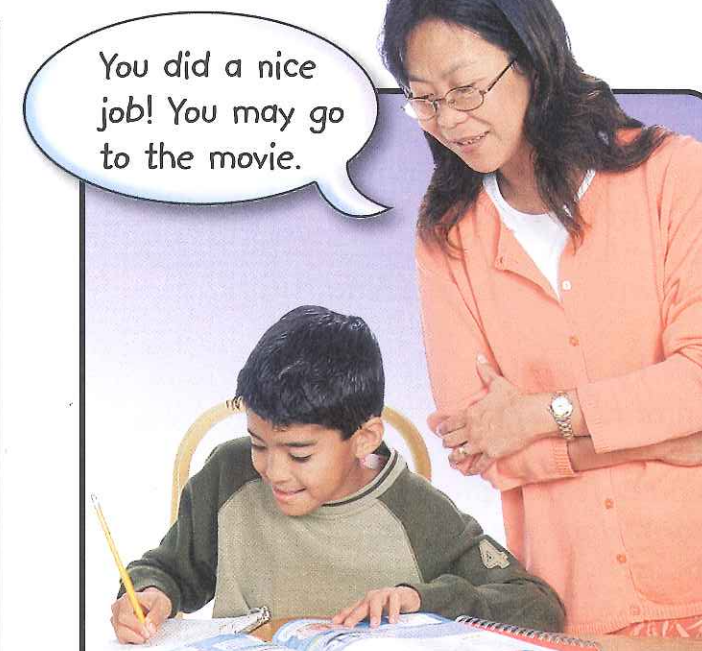
Cody and his mom listen to each other. Cody considers his mother's view and understands her rules.

3 Negotiate.



Cody offers a solution to satisfy both of them. His mother agrees but has a condition that must be met.

4 Find a way for both sides to win.



Cody does his homework—he knows his grades depend on it. His mother knows she has done what is best for Cody. And Cody gets to go to the movie.

Problem Solving

- Rashawn's father has told Rashawn to mow the lawn on Friday afternoon. At school on Friday, Rashawn learns that all his friends are getting together that afternoon for a basketball game. He wants to play, too, but he knows his father expects the lawn to be mowed.
 - Use the steps for **Resolving Conflicts** to help Rashawn handle the situation.
- Courtney has promised friends they can come to her house on Saturday to watch a movie. However, she knows her sister wants to watch her favorite TV program at the same time.
 - How could Courtney handle the conflict in a caring way?

LESSON
6

Choices You Make Affect Your Growth

Lesson Focus

Healthful choices about physical activity, diet, rest, and hygiene can make puberty a positive time of growth and development.

Why Learn This?

Information about healthful choices can help you develop a program for taking care of your body.

Vocabulary

hygiene

Personal Health Plan

Real-Life Situation

You're having trouble sleeping because you're worried about a test.

Real-Life Plan

Make a list of things you can do to stop your worrying about the test.

Exercise and Proper Diet Help Your Body Grow

Your body needs special care as it goes through the changes of puberty. Being physically active and eating properly are two important ways to support your growing body.

You probably know that exercise is good for you physically. People who exercise regularly increase their endurance, strength, and flexibility, and they are likely to sleep better. However, you may not know that physical activity is also good for you mentally and emotionally. Exercise helps you feel more confident and enables you to focus better, such as when doing schoolwork. Exercise also reduces emotional stress so

Physical activity is more fun when you work out with a friend and vary the kinds of activities you do. ▶



▲ Eating different types of foods, such as grains, fruits, meats, and vegetables, is the best way to get the nutrients you need. You will learn more about foods in Chapter 3.

that you are better able to solve any problems you might have. You will learn more about the benefits of exercise in Chapter 4.

Eating a healthful diet will supply you with energy and provide you with nutrients to help you grow. The food you eat affects how you look and feel, how well you resist diseases, and how well you perform mentally and physically. Since foods differ in the nutrients they provide, it's important to have variety in your diet. The photograph above shows many healthful food choices.

The amount of food you eat should match your body's needs. Eating too much food and getting too little exercise can make you gain weight. Eating too little food will make you become tired and too thin. Both extremes put your growth and health at risk. By choosing to eat healthfully and to exercise, you show that you are growing up and taking responsibility for yourself.

CAUSE AND EFFECT What can cause a person to gain weight?

Consumer Activity

Access Valid Health Information Packaged foods have labels that tell you what the foods are made of and what nutrients they provide. Read the labels of any packaged foods that make up your next few meals. Compare the nutrients they offer.



Other Choices Affect Your Growing Body

Sleep, too, is important to your growth and health. When you sleep, your body has time to recover from its daytime activities. It repairs tissues and releases built-up stress. Much of your body's growth takes place while you sleep.

Taking care of your body also includes making choices about personal **hygiene** (HY•jeen), or cleanliness. As your body changes, perspiration odors and skin problems can make hygiene important. Develop a daily routine you can follow before leaving for school in the morning or before going to bed. You will learn more about the importance of good hygiene in Chapter 2.

MAIN IDEA AND DETAILS Give details to support this statement: **Exercise, diet, rest, and sleep affect your growing body.**



Resting during the day has many of the same benefits as sleeping at night. Find various ways to rest during the day. ▶

Myth and Fact

Myth: If you eat a spicy food, such as pizza, at bedtime, you will have nightmares.

Fact: The only thing spicy foods may do when you eat them at bedtime is to keep you awake. That's because you will feel too full to fall asleep.

Lesson 6 Summary and Review

1 Summarize with Vocabulary

Use vocabulary and other terms from this lesson to complete the statements.

Many _____ you make can affect your growth. _____ reduces stress. Eating a healthful _____ supplies you with energy. Sleep and other kinds of _____ allow your body to recover. Practicing good _____ helps prevent body odor.

2 What are five benefits of exercise?

3 Critical Thinking If you feel tired after school and have only half an hour before soccer practice, what two things might you do to help restore your energy?

4 MAIN IDEA AND DETAILS

Draw and complete this graphic organizer to show the supporting details in this lesson.



5 Write to Inform—Explanation

Write a paragraph that explains the importance of sleep for a teenager.

ACTIVITIES



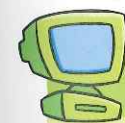
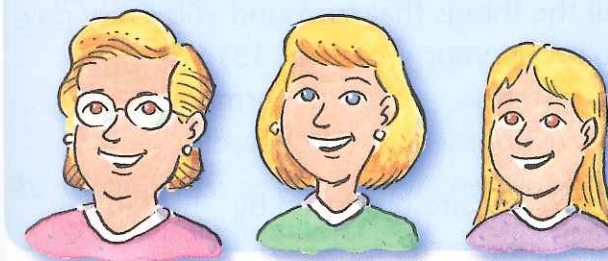
Physical Education

Perform a Song Select a song you like that has a strong beat. You can use the song's tune, but write your own lyrics about any or all of the body systems. Or, make up lyrics to go with your own tune. Perform your song as you exercise, skip rope, or bounce a basketball in time with the song's beat.



Science

Research Heredity Do research on heredity. What are some physical characteristics that children inherit from their parents? Can a child have characteristics that grandparents have but parents do not have? Describe your findings in a booklet, and place it in the class library.



Technology Project

With a computer, make a slide presentation about the main parts and the jobs of each body transport system. Present your slides to your family or classmates.



For more activities, visit **The Learning Site.**
www.harcourtschool.com/health

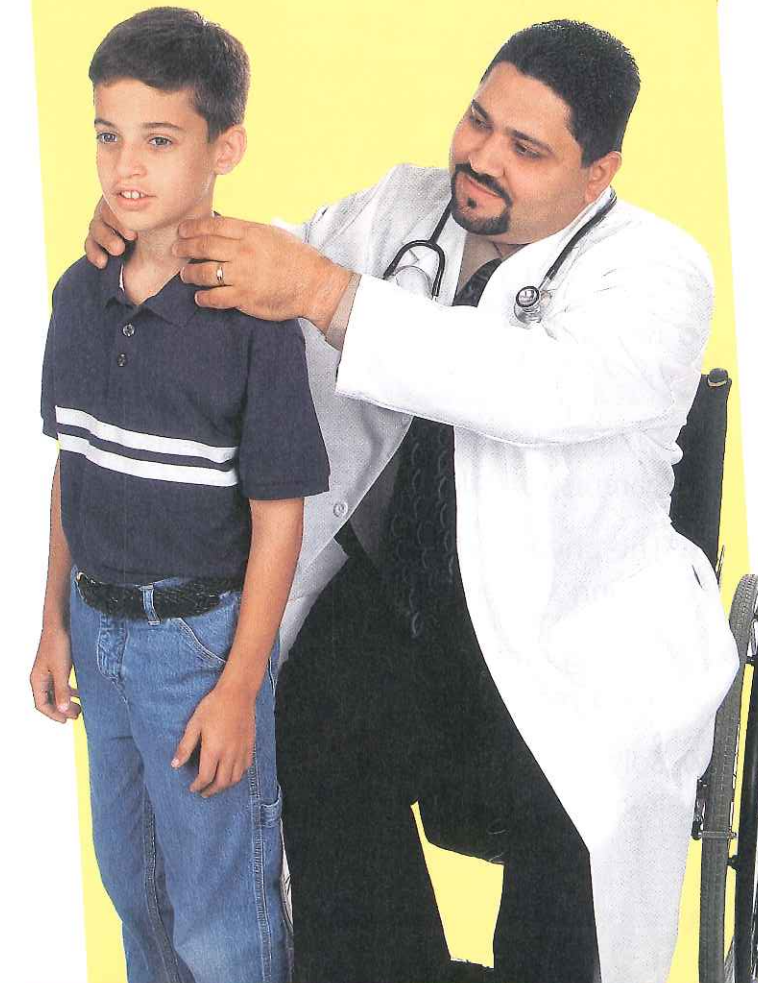


Home & Community

Communicating Make a poster encouraging teenagers who are having problems to talk with a parent or another trusted adult. Display your poster in your classroom or cafeteria.

Career Link

Endocrinologist Endocrinologists are doctors who specialize in the endocrine system. Suppose you are an endocrinologist. What might you say to an eleven-year-old boy who complains that he has not yet gone through puberty? Write your response in a paragraph.

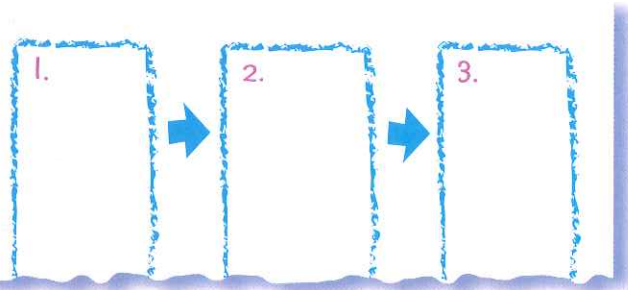


Chapter Review and Test Preparation

Focus Skill Reading Skill

SEQUENCE

Draw and then use this graphic organizer to answer questions 1 and 2.



- 1 Which organ of the circulatory system pumps blood to the rest of the body?
- 2 Which blood vessels allow oxygen and nutrients to pass through their walls?

Use Vocabulary

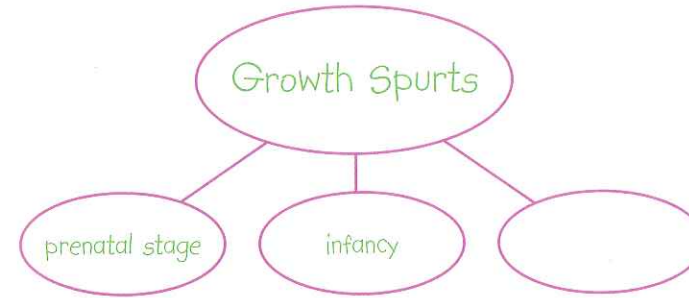
Match each term in Column B with its meaning in Column A.

Column A	Column B
3 Groups of organs	A abstract thinking
4 Groups of similar cells	B concrete thinking
5 Bands that connect bones at joints	C heredity
6 Bands that attach muscles to bones	D ligaments
7 Passing of traits from parents to children	E puberty
8 The physical changes during adolescence	F systems
9 Solving problems by using real objects	G tendons
10 Solving problems by imagining solutions	H tissues

Check Understanding

Choose the letter of the correct answer.

- 11 What are tiny air sacs in the lungs called? (p. 7)
A alveoli C nephrons
B capillaries D blood vessels
- 12 Blood passes through tiny filters in the kidneys, called _____. (p. 9)
F neurons H capillaries
G nephrons J glands
- 13 Places where two or more bones meet are called _____. (p. 10)
A ligaments
B tendons
C joints
D cartilage
- 14 What is another name for nerve cells? (p. 12)
F nephrons H alveoli
G systems J neurons
- 15 All the things that surround you every day make up your _____. (p. 15)
A systems C hormones
B environment D heredity
- 16 Hormones are produced by _____ in the endocrine system. (p. 16)



- 17 Which growth stage is missing from the graphic organizer? (p. 22)
A adolescence
B puberty
C independence
D adulthood
- 18 Your _____ is the way you think your body looks. (p. 23)
F puberty H body image
G adolescence J privilege
- 19 Sleep and other kinds of _____ allow your body to recover from the day's activities. (p. 34)
A nutrition
B exercise
C rest
D hygiene
- 20 Cleanliness, or _____, involves cleaning your whole body. (p. 34)
F puberty H perspiration
G hygiene J relaxation

Think Critically

- 21 How could a food label be helpful in choosing healthful foods?
- 22 If you had a problem with your esophagus, which body function would likely be affected?

Apply Skills

- 23 **BUILDING GOOD CHARACTER**
Trustworthiness You promised to meet a friend to go jogging after school. When you get home, you become interested in a TV show that won't end until after you are supposed to meet your friend. Use what you know about being trustworthy to make a decision about what you should do.
- 24 **LIFE SKILLS**
Resolve Conflicts You and your father disagree about whether you should get an expensive pair of basketball shoes for the upcoming season. He thinks you will grow out of the shoes too quickly. Use what you know about resolving conflicts to work out a fair agreement with your father.

Write About Health

- 25 **Write to Inform—Explanation** Explain why you might expect to face new problems during adolescence.