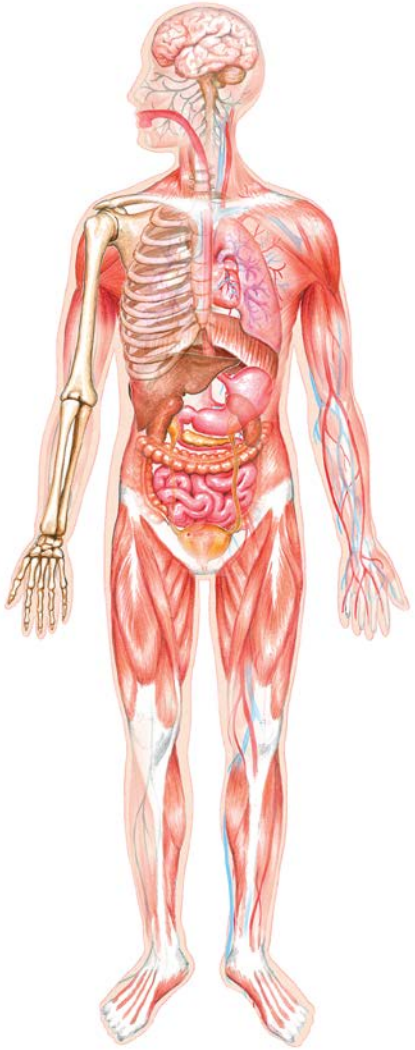
THE HUMAN BODY

A Science A–Z Life Series

Word Count: 1,217



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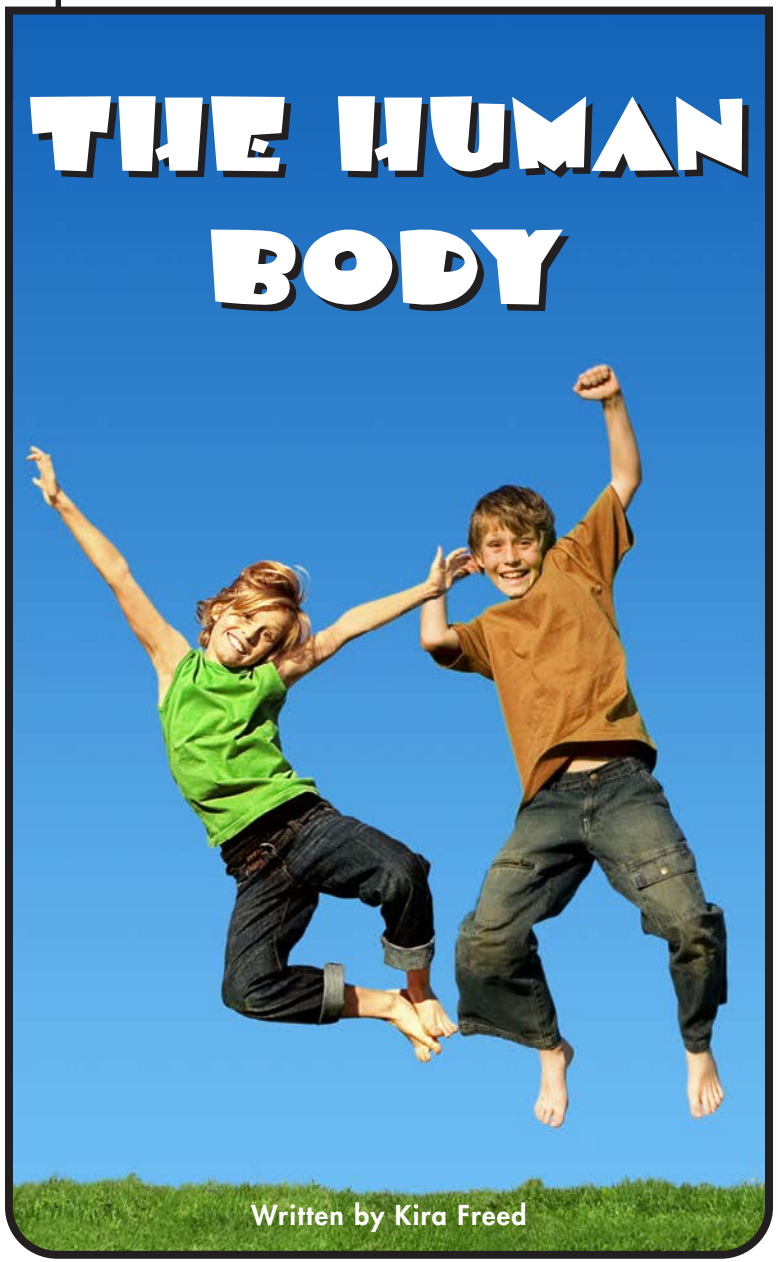

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THE HUMAN BODY

Written by Kira Freed

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KEY ELEMENTS USED IN THIS BOOK

The Big Idea: Humans have a common bond with all other life on Earth. All living things are made up of key parts that help them meet their needs. These parts must work together to keep an organism healthy. An understanding of how our bodies work can raise our awareness of our own health, leading us toward safe and healthy practices. In this way, we can protect our most important asset—our body.

Key words: arteries, bladder, blood, bloodstream, body, bone, bone marrow, brain, brain stem, carbon dioxide, cardiac muscle, cells, cerebellum, cerebrum, circulatory system, digestive system, excretory system, exhale, healthy, heart, human, inhale, joint, kidneys, large intestine, liver, lungs, muscles, muscular system, nerves, nervous system, organs, oxygen, pelvis, pulse, respiratory system, ribs, saliva, skeletal muscles, skeletal system, skull, small intestine, smooth muscle, spine, stomach, sweat, system, tissue, veins

Key comprehension skills: Classify information
Other suitable comprehension skills: Compare and contrast; cause and effect; main idea and details; identify facts; elements of a genre; interpret graphs, charts, and diagrams

Key reading strategy: Summarize
Other suitable reading strategies: Ask and answer questions; connect to prior knowledge; visualize; using a table of contents and headings; using a glossary and bold terms

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nerves thin fibers that carry signals between the brain and other parts of the body (p. 10)

skeletal muscles strong muscles that connect to bones and allow the body to move (p. 9)

small intestine the thin, coiled part of the digestive system in which nutrients are removed from food and put into the bloodstream (p. 16)

smooth muscle muscle that moves substances without a person's control and is found in many internal organs (p. 9)

spine a column of bones that provides the main support for the body; the backbone (p. 6)

stomach the organ where food is mixed and partially digested (p. 9)

veins blood vessels that carry blood from the body's cells toward the heart (p. 15)

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Introduction

Your body is like a busy city. A city has homes, stores, streets, a power station, and much more. Like a city, your body has many systems that work together to keep you alive. The systems are working all the time, and they all need to stay healthy to do their jobs.

Do You Know?

Check your knowledge before reading this book. What do you know about each of the ten systems in your body?

- skeletal system
- muscular system
- nervous system
- respiratory system
- circulatory system
- digestive system
- excretory system
- reproductive system
- endocrine system
- immune system

Glossary

arteries blood vessels that move oxygen-rich blood away from the heart toward the body's cells (p. 14)

bone marrow spongy material that produces blood cells and is found in the center of bones (p. 7)

brain the control center of the nervous system (p. 5)

cardiac muscle the type of muscle found in the heart (p. 9)

heart the organ that pumps blood throughout the body (p. 5)

kidneys a pair of excretory organs that filter waste products from blood (p. 18)

large intestine the thick, lower end of the digestive system in which water is removed from digested food (p. 17)

liver a large excretory organ that filters blood and helps with digestion (p. 19)

lungs two spongy organs that bring oxygen to the blood and remove carbon dioxide from the blood (p. 5)

muscles body tissues that let the body move by contracting and relaxing (p. 8)

Conclusion

You have just read about the main jobs of some of your body systems. Each system has many more jobs as well. All your body systems are working all the time to keep you healthy.

You can take care of all your body systems by eating healthy food and getting enough exercise and sleep. Take good care of your amazing body, and it will take good care of you!

Your body knows how to do an amazing number of jobs.

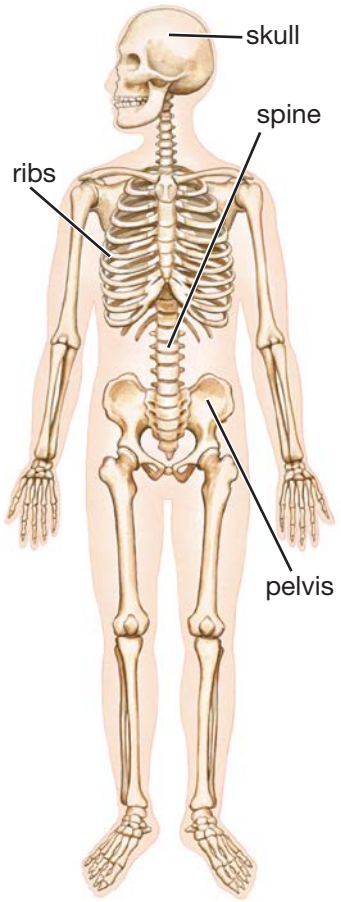
Every minute of your life, your **heart** pumps blood through your body. Messages move to and from your **brain**, and your **lungs** carry oxygen to cells. Your body kills bad germs, controls your temperature, and gets rid of waste products. It also does thousands more jobs—even while you are sleeping!

In this book, you will learn about seven important body systems. As you read, think about all the jobs each body system does to keep you alive and healthy.

The Skeletal System

The bones of your skeletal system support the rest of your body. Like the steel beams inside the walls of buildings, they support all the other systems. Without bones, you would be a mushy blob! Bones also help you to move, and they protect your organs.

The Skeletal System



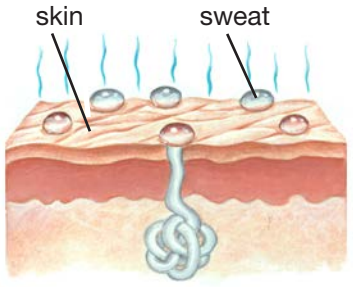
Your **spine**, the main support, is a long column of twenty-six bones. Your skull protects your brain from getting hurt. Your ribs wrap around your chest, protecting your heart and lungs. Your pelvis helps to protect the organs in your belly.

Do You Know?

You have two kidneys, but you can live with just one. People who have had one kidney removed can live a long, healthy life. The kidney that remains grows bigger and does the work of two kidneys.

Your **liver** is another large organ that helps filter out waste products. It helps change poison gases into harmless liquids.

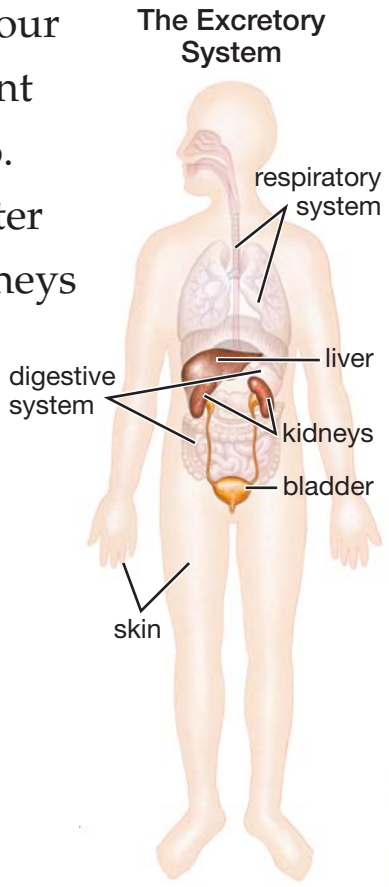
Your skin is part of your excretory system, too. Tiny glands in your skin make sweat that comes out at the surface as drops. Your sweat glands help your body get rid of extra water. They also help remove extra chemicals and heat.



The Excretory System

Your body makes many things it does not need as you breathe air and digest foods and drinks. The excretory system gets rid of all these waste products.

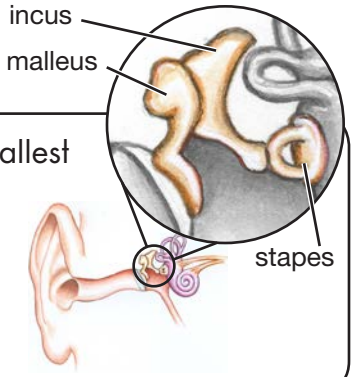
You have learned that your lungs help get rid of carbon dioxide and water. Your **kidneys** are important excretory organs, too. They work like a water treatment plant. Kidneys filter out waste chemicals and collect them.



This waste moves from your kidneys to your bladder. Then it leaves your body as urine.

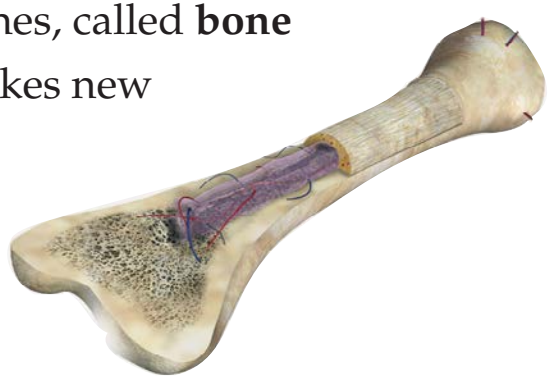
Do You Know?

Can you guess where the smallest bones in your body are? They're in your middle ears! Three tiny bones carry vibrations from your eardrums to your inner ears.



Long, strong bones support your arms and legs. Your hands, wrists, feet, and ankles have many smaller bones. Each of the 206 bones in your body has a special job.

Did you realize your bones are alive? Bones are made of living cells. This is why bones grow. Spongy stuff in the center of bones, called **bone marrow**, makes new blood cells.



The Muscular System

The muscular system works with the skeletal system so you can move. Unlike other body tissues, your **muscles** can contract (become shorter and tighter) or relax (become longer and looser).

The muscles that bend your joints work in pairs. When one contracts, its partner relaxes. Then they switch jobs.

Your body has three different types of muscles—skeletal, smooth, and cardiac.

The Muscular System

WOWSER!

Your body has more than 650 muscles! Almost half your weight is muscles.

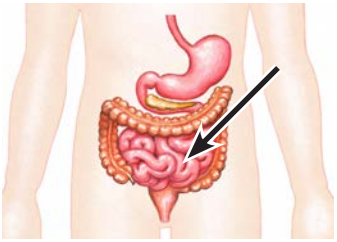
DO YOU KNOW?

Different foods take different amounts of time to move through your digestive system. Fruits and vegetables take less than twelve hours. A steak can take two or three days because meat is harder to digest.

The walls of the small intestine absorb nutrients from the food. They enter your bloodstream and move to your cells to nourish them. Any food that was not absorbed moves on to your **large intestine**, or colon. There, water from that food is absorbed into your body. The rest of the food keeps moving along. You don't need it, so it leaves the body.

WOWSER!

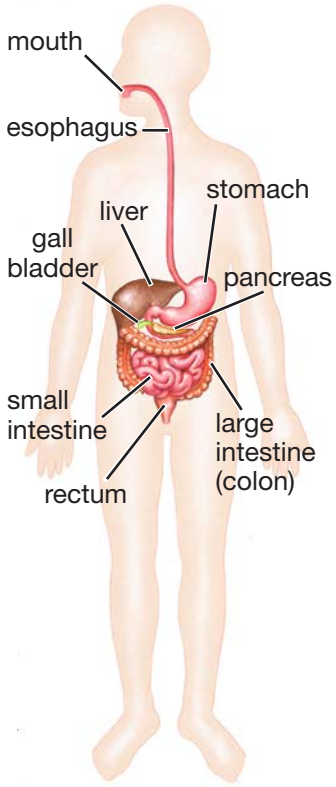
Your small intestine can be as long as 7 meters (23 ft.)! It fits in your body because it is coiled. No wonder it takes time for food to move through it.



The Digestive System

Your digestive system breaks down food so your body's cells can use it to make energy. Food enters your body through your mouth. As you chew, saliva mixes with the food and begins to break it down. When you swallow, the food moves down a long tube to your stomach.

The Digestive System



Your stomach muscles squeeze the food to break it into smaller pieces. Chemicals mix with the food and help break it down, too.

Next, the food moves to your **small intestine**. Other chemicals help break down the food even more.

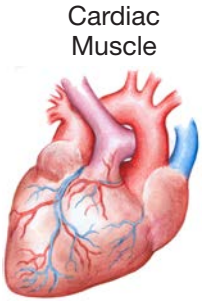
Try This

Sit on a chair. Place one hand on top of your thigh and the other hand under your thigh. Straighten and bend your leg. Can you tell when one muscle contracts and the other one relaxes?

Strong **skeletal muscles** connect to bones and help you move. These are the only muscles you can control.

Smooth muscle tissue moves things through your body. When you swallow, smooth muscle tissue moves food toward your **stomach**. Smooth muscle tissue also carries blood to every part of your body.

Cardiac muscle is found only in your heart. This amazing muscle works all the time for your whole life.

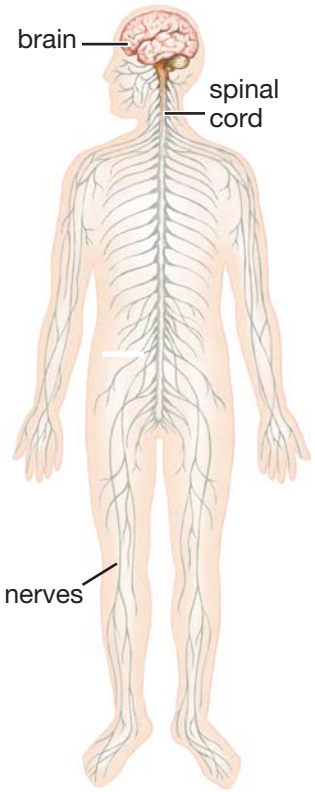


Smooth and cardiac muscles work without you thinking about them.

The Nervous System

Your brain is in charge of your nervous system. It controls just about all you do—speaking, thinking, feeling, and most movement. To do its jobs, your brain uses **nerves** to communicate quickly with every cell. Electrical signals move along the nerves, quickly carrying messages between your brain and other body parts.

The Nervous System



Thousands of nerves make up your spinal cord, which runs down your spine. Nerves branch off from your spinal cord to reach every part of your body.

WOWSER!

Each red blood cell lives for only about four months. But your body makes new cells all the time. During its short lifetime, a red blood cell moves over 482 kilometers (300 mi.) through your blood vessels!

Then blood moves back to the heart through your **veins**. Blood in veins is darker because it does not carry oxygen.

If you put your hand over your heart, you can feel your heartbeat. You can feel the same rhythm as blood moves through arteries close to your skin. This rhythm is your pulse.

Try This

Here are two easy places to feel your pulse:

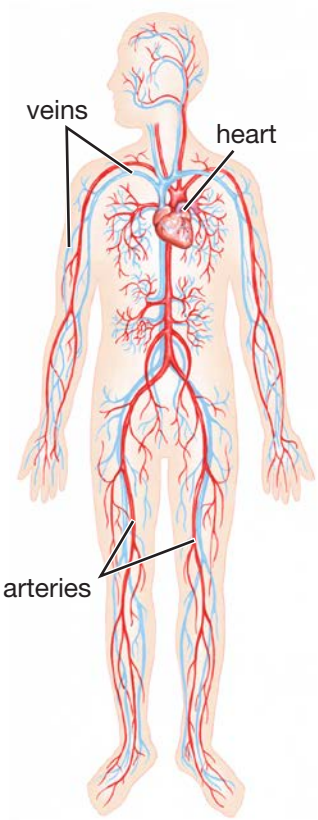
- on either side of your neck, just under your jaw
- on the inside of either wrist

The Circulatory System

Your heart is the center of your circulatory system. Your heart has a big job to do, pumping blood to every cell in your body without stopping.

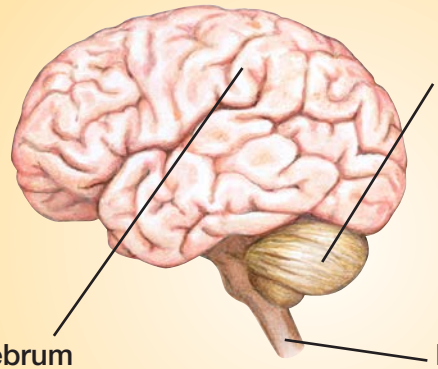
First, the heart pumps blood to your lungs to pick up oxygen. Then the heart pumps oxygen-rich blood to all your cells. Blood moves away from your heart through **arteries**. The blood in arteries is bright red because it carries oxygen.

The Circulatory System



After your blood gives its oxygen to cells, it picks up carbon dioxide and other waste products from the cells.

Parts of the Brain



The brain has three main parts, shown in the drawing. These parts work together to help you live, think, feel, and do other things. Which parts of your brain are you using right now?

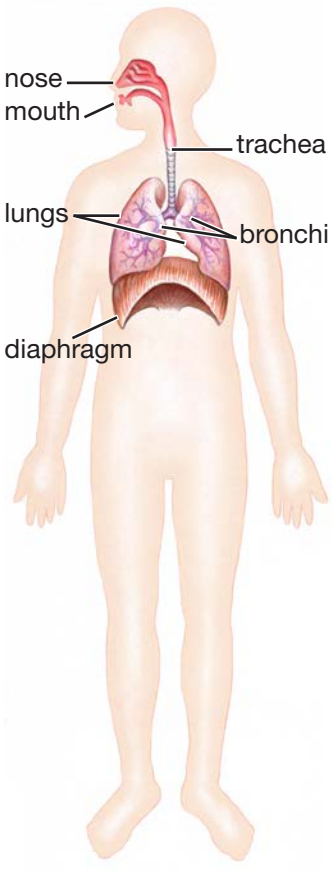
WOWSER!

Signals in your nervous system can move more than 290 kilometers (180 mi.) per hour. That's more than twice as fast as cars move on a freeway! That's why you notice it so soon if you stub your toe.

The Respiratory System

Your respiratory system is in charge of your breathing. When you breathe in, or inhale, you take in oxygen. Your respiratory system carries the oxygen to your blood. Then the blood carries oxygen to all of your cells. Cells need this oxygen to make energy for your body.

The Respiratory System



When you breathe out, or exhale, you release water and carbon dioxide into the air. The water and carbon dioxide are waste products left over from making energy in your cells.

Air enters your body through your nose and mouth. It moves down your windpipe into your chest. There, it divides into two branches that connect to your lungs. In your lungs, smaller branching tubes end in tiny air pockets surrounded by small blood vessels. Oxygen seeps out through the walls of these air pockets and enters your bloodstream. Then, red blood cells pick up the oxygen and carry it to all the cells of your body.

Your blood also carries unneeded carbon dioxide back from your cells to your lungs. It leaves your body when you exhale.

Do You Know?

All your cells need oxygen to stay alive, and they can only survive for a few minutes without it. Cells need oxygen to break down the food you eat and turn it into energy.