



ESSENTIAL QUESTION

# What Are Organs and Body Systems?



## Engage Your Brain

Find the answer to the following question in this lesson and record it here.

What part of your body serves the same function as the part of the octopus shown here?

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## ACTIVE READING

### Lesson Vocabulary

List the terms. As you learn about each one, make notes in the Interactive Glossary.

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### Main Ideas and Details

Detail sentences give information about a main idea. The information may include examples, features, characteristics, or facts. Active readers look for details that support the main idea.



# Building a BODY

Your body has hundreds of different parts! These parts work together to keep you healthy.

**ACTIVE READING** As you read these two pages, circle each lesson vocabulary term and underline its definition.

**E**very living thing needs certain things to survive. An **organism** is a living thing. It is made of parts that work together to meet its needs. Some parts are extremely small. Others are large.

An **organ** is a body part that is made up of smaller parts that work together to do a certain job. For example, your eye is an organ. It is made of a clear lens, a colored iris, and other parts that work together to enable you to see.

Groups of organs work together. An **organ system** is a group of organs that work together to do one type of job. Your mouth and stomach are part of one organ system. They work together to supply your body with energy from food. You have many organ systems in your body.

## Eyes

Eyes are organs that help you \_\_\_\_\_. They send information about the world around you to another organ, your brain.

## Teeth

Your teeth are bones, and bones are organs. What do teeth do?

## Muscles

Muscles are organs that help you \_\_\_\_\_. Messages from your brain tell your muscles what to do.



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Animals are organisms. Plants are organisms, too. Did you know that plants have organs? Roots absorb nutrients and water for the plant. Leaves use sunlight to make food for the plant. Stems support the leaves. Stems also transport water from the roots and food from the leaves. A protective layer covers the plant and keeps the plant from drying out.

Like plants, humans have organs that work together to help us stand. We have an organ that protects us from drying out. We have organs that supply us with food. Plant and animal organs are different, but they are all alike in one way: They all help an organism meet its needs so it can live.

## Match It!

► Draw a line to connect the plant part to an animal part that does a similar job.

### Bones

Bones support your body. They enable you to stand. Each bone in your body is an organ.



### Mouth

Your mouth brings food into your body. Your lips, teeth, and tongue work together to help you chew and swallow food.



### Skin

What's the largest organ in your body? Your skin is. It protects your body from germs and keeps your body from drying out.



### Bark



### Stems



### Leaves



# The Information HIGHWAY

Keep your eye on the ball! In just seconds you can see a ball, run toward it, and swing a racket! How does the body relay all of the information needed to do this? Read on to find out.

**ACTIVE READING** As you read this page, underline the names of parts of the nervous system.

**S**ensing your surroundings and communicating information within the body are the main jobs of your *nervous system*. Your nervous system is made of tiny structures called *nerve cells*. Chains of long nerve cells make up nerves. Nerves carry information to and from the **brain**. The brain is the organ that processes information. It's like a computer made of millions of nerve cells working together.

A rope-like bundle of nerves, called the *spinal cord*, runs along your backbone. Your spinal cord is the main pathway for information traveling to and from the brain. Nerves connect to your spinal cord from all over your body.

Some of these nerves send information to the brain. Others receive signals from the brain.

Imagine that you're playing tennis. Nerves in your eyes sense light. These nerves, like other nerves in your head, send information directly to your brain without routing the signal through your spinal cord. You see the ball coming toward you. Your brain decides on an action. It sends instructions through your spinal cord to nerves in your body. The messages from your brain "tell" your legs to run across the court and your arms to swing the racket and hit the ball. All of this communication takes place in seconds!





# Information Relay

Fill in the blanks to describe the path that a nerve signal might take in this tennis player.

1. The boy's \_\_\_\_\_ sense the ball coming toward him.

2. His \_\_\_\_\_ processes this information.

3. Messages from the \_\_\_\_\_ travel down the \_\_\_\_\_.

4. \_\_\_\_\_ in his arms deliver the message from his brain to swing the racket.

# SENSING

## Surroundings

A carnival is a feast of sights, sounds, tastes, and smells! How do you sense all of that information?

**ACTIVE READING** As you read this page, draw a box around phrases that describe sensory structures.

**S**enses are your body's way of gathering information about the world around you. Special structures in certain parts of your body can detect light, sound, and chemicals in the air and in the food you eat.

**A Sight:** The part of the eye that gives us our eye color is a muscle called the *iris*. Light enters the eye through a hole in the iris called the *pupil*, passes through the lens, and hits the back of the eye, called the *retina*. Inside the retina are special nerve cells that detect light. They send signals that travel along nerve pathways to the brain. The brain interprets this information and we see.

**B Hearing:** The part of your ear that you see is called your outer ear. The outer ear funnels sound into the middle ear. In the middle ear, sound causes the eardrum to vibrate. The vibrations are passed to tiny bones called the hammer, anvil, and stirrup. These bones pass vibrations to the inner ear. There, a fluid-filled structure called the cochlea [koh•klee•uh] passes vibrations to tiny hairs attached to nerves. The nerves send messages about the vibrations to the brain, and you sense sound.

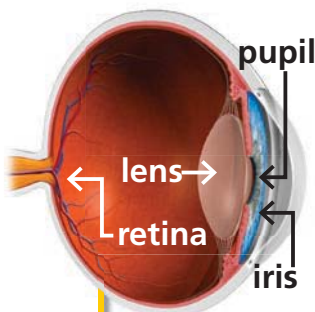
**C Smell:** When you breathe, air travels through your nose. Inside your nose are structures that sense chemicals in the air. They are attached to nerve cells in the olfactory bulb that send messages to the brain about the chemicals they sensed. This makes up your sense of smell.

**D Taste:** Have you ever noticed small bumps all over your tongue? These bumps are called *taste buds*. They sense the chemicals in food. Taste buds are attached to nerves that send messages to the brain about the chemicals they sense. The brain interprets this information as the sense of taste.



## A Eyes

Light enters the eye through the \_\_\_\_\_, passes through the \_\_\_\_\_, and hits the \_\_\_\_\_, where special structures detect \_\_\_\_\_.



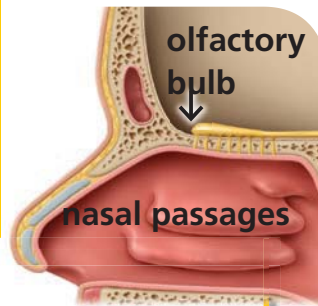
## B Ears

Sound enters the ear. Vibrations pass from the \_\_\_\_\_ to tiny bones, through the \_\_\_\_\_, to tiny hairs attached to nerves.



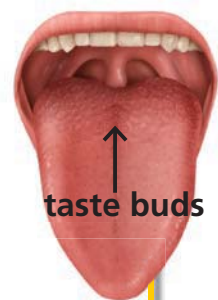
## C Nose

When you breathe, structures in the nose detect \_\_\_\_\_ that are carried in the air.



## D Tongue

When food enters the mouth, special structures on the tongue sense \_\_\_\_\_ in food. These structures are called \_\_\_\_\_.



# Sensory OVERLOAD

All organisms have sensory structures that help them survive. Flies have compound eyes. Instead of 1 lens, they have over 5,000!

**ACTIVE READING** As you read these two pages, find and underline four facts about plant and animal senses.

## Animal Senses

Draw an animal that you are familiar with. Label its sensory organs, and describe how it uses them.



### Sight

Snails have their eyes on the ends of stalks. The eyespots can sense light and dark. You can see eyespots on the tip of each eyestalk shown here.

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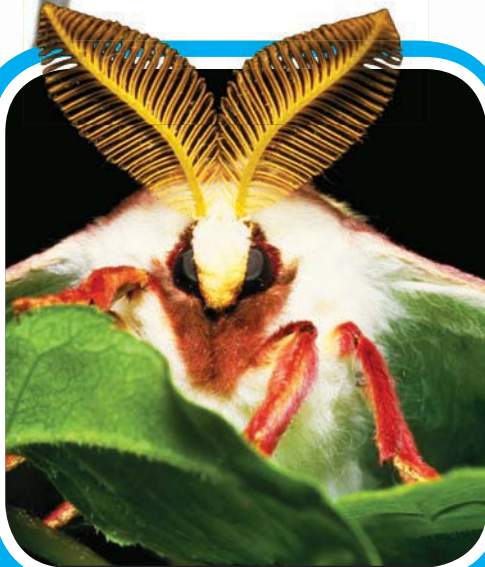
## Sound

Bats “see” with their ears! They make squeaking noises and listen for the sounds to echo back to them. The way the sound bounces and the amount of time it takes for the sound to return let the bat know what is in its path. Dolphins use a very similar system under water.



## Smell

Moths have “noses” on the tops of their heads. The moth’s antennae [an•TEN•ee] have structures that sense chemicals in the air.



## Touch

The Venus’ flytrap has special leaves that are sensitive to touch. When a fly lands on them, the fly touches trigger hairs. The hairs send a message to the leaves of the plant, and the leaves snap shut. The fly is trapped!



# The SKIN You're In

Some people don't think of skin as an organ, but it is. Our bodies couldn't survive without it.

**ACTIVE READING** As you read, circle the different parts of the integumentary system described below.

Covering your body is a protective layer called **skin**. Skin is part of the *integumentary* [in•teg•yoo•MEN•ter•ee] system. Fingernails, toenails, and hair are, too. This system helps to protect the inside of your body.

Skin keeps germs out. If you've ever had a cut that got infected, you know how important it is to keep germs from entering your body. At the same time, skin keeps water in. Your waterproof skin keeps you from becoming dehydrated.

What happens when you get too hot? Sweat helps cool your body. Also, tiny blood vessels near the surface of the skin help to cool your blood.

But what if you get cold? Hair helps to keep your head warm in cold weather. Hair also helps to protect your scalp from injury and shades your scalp from the sun's harmful rays.

## Fingerprinting

Draw your own friction ridges in the circles at the tips of these fingers.



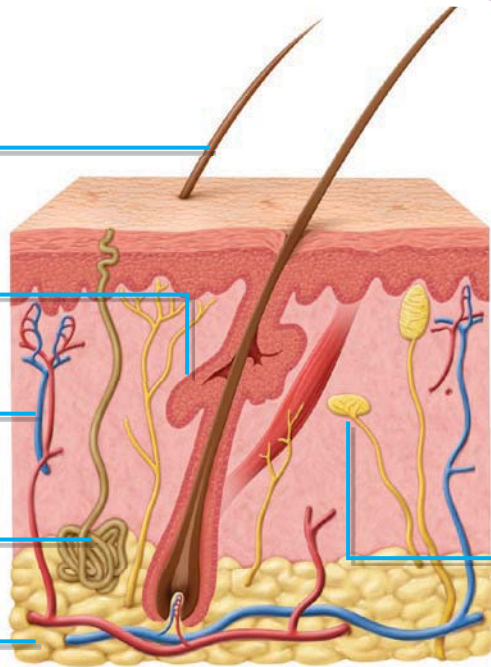
hair

oil  
gland

blood  
vessels

sweat  
gland

fat



## Epidermis

This is the outer layer of the skin. It is thin in some places, like your eyelids, and thick in others.

## Dermis

This is the inner layer of the skin. It contains hair follicles, sweat glands, blood vessels, and nerve endings.

## Nerve endings

These are special structures that sense touch, heat, cold, pain, pressure, and vibration.



Look at your fingers. Do you see swirls, loops and waves? These are friction ridges, which form your fingerprints. They allow your fingers to be more sensitive to touch.

# Plant and Animal COVERINGS

Would you want to pet a cactus?  
There are many different kinds of  
plant and animal coverings. They all  
protect the plant or animal.

**ACTIVE READING** Circle the different  
types of plant and animal coverings that are  
listed below.

**T**ake a look at the examples of animal  
coverings on these pages. Can you identify  
them? Animals such as monkeys, horses, and  
rabbits are covered in soft fur. Birds are covered  
with feathers. Fish and snakes are covered in  
scales. Some animals, such as lobsters and turtles,  
have hard shells.

Plants do not have skin, but they do have  
special coverings. Many trees are covered with a  
thick, hard bark to protect the inner plant. Plant  
leaves have a waxy coating that keeps the plant  
from drying out.

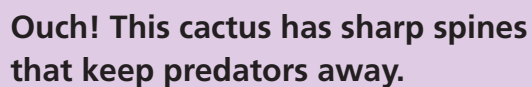
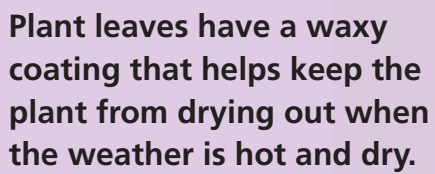
Even though plant and animal coverings may  
look different, they still protect the organisms  
from predators, disease, injury, and drying out.



These colorful feathers cover  
the bird's skin. They keep the  
bird warm and keep water  
out. Feathers on the wing  
help the bird fly.

tree bark





## Use a Scale



Look at these magnified scales from a banded rainbow fish. The black line on the picture is a scale showing how many scales are in 1 centimeter. If the body of the fish is 12 cm long, how many scales long would the fish's body be?

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**This monkey has thick fur. Fur helps to keep the monkey warm in cold weather.**