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1 Health

Let's speak!

- Who can you see in the picture?
- What is happening?
- When was the last time you had a vaccination?

Health and Illness

Health is a state of physical and mental well-being. When you are healthy, you feel well. Illness is the opposite of health. You feel tired and your body does not work properly. Symptoms, like coughs, pain, or fever indicate that the body is ill.

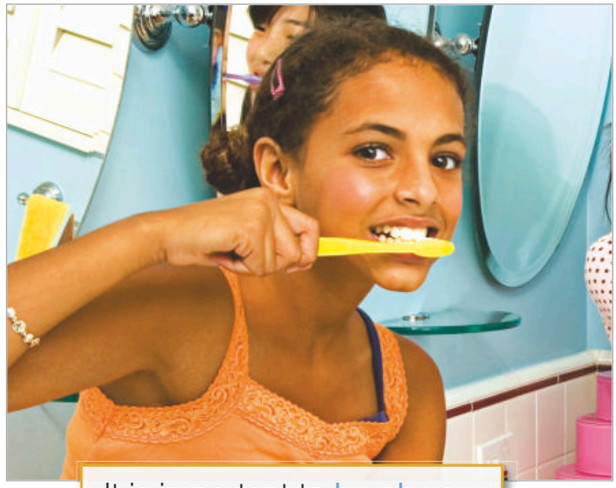
Fever is a symptom of illness.

Regular physical activity is important for good health.

Healthy Habits

To stay well, healthy habits are necessary. It is important to:

- sleep eight or nine hours every night and rest when tired.
- eat a balanced diet.
- eat five meals a day and always eat breakfast.
- maintain good hygiene. Wash hands before meals and take a shower every day.
- breathe fresh air and avoid places where people are smoking.



It is important to brush your teeth after every meal.

It is important to always eat breakfast.

Can you...?

Identify healthy habits with your partner.

You: *I play tennis twice a week.*

Your partner: *I eat fruit every day.*

What Causes an Illness

When were you last ill? What was the problem?

Types of Illness

An illness can be non-infectious or infectious:

- Non-infectious illnesses have different causes. Injuries or poor diet can cause illness.
- Infectious illnesses are caused by harmful bacteria or viruses. These illnesses can be contagious or non-contagious.
- An illness is contagious when a sick person transmits the illness to a healthy person. Flu and measles are contagious illnesses.
- Tetanus and salmonellosis are non-contagious illnesses.

A broken arm is a non-infectious illness.

Illness: Bronchitis

Affected area: bronchi in the respiratory system

Symptoms: persistent cough, fever, and general discomfort

Bacteria

Bacteria are unicellular microorganisms.

There are two types of bacteria:

- beneficial bacteria like those used to make yogurt.
- harmful bacteria that can cause illnesses. These bacteria are called pathogenic bacteria.

Pathogenic bacteria cause these illnesses:

Illness: Bacterial Meningitis

Affected area: nervous system

Symptoms: fever, stiff neck, and severe headaches

Illness: Salmonellosis

Affected area: digestive system

Symptoms: diarrhea, vomiting, stomach pain, and fever

Can you...?

With a classmate, identify the symptom that bacterial meningitis, salmonellosis, and bronchitis have in common.

Other Microorganisms

There are other microorganisms that can cause illnesses. These can be unicellular or multicellular.

Name: Amoeba
Type: unicellular microorganism
Illness caused: intestinal illness
Symptoms: diarrhea and fever

Name: Plasmodia
Type: unicellular microorganism
Illness caused: malaria
Symptoms: periodic, high fevers

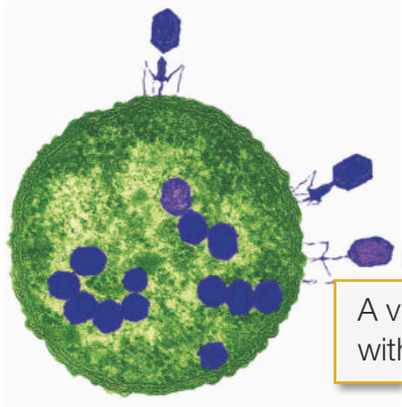
Name: Candida (yeast)
Type: unicellular microorganism
Illness caused: damages the skin
Symptoms: itchy skin

Name: Fungi
Type: multicellular microorganism
Illness caused: athlete's foot
Symptoms: itchy skin

Viruses

Viruses cause infectious illnesses such as flu, measles, herpes, and AIDS.

A virus is not a living thing, but it needs cells to replicate itself.



A virus can be seen with a microscope.

Can you...?

True or false? Test a partner.

You: *Pathogenic bacteria cause illnesses.*

Your partner: *True.*

Preventing and Treating Infectious Illnesses

Pathogenic microorganisms can enter the body in different ways:

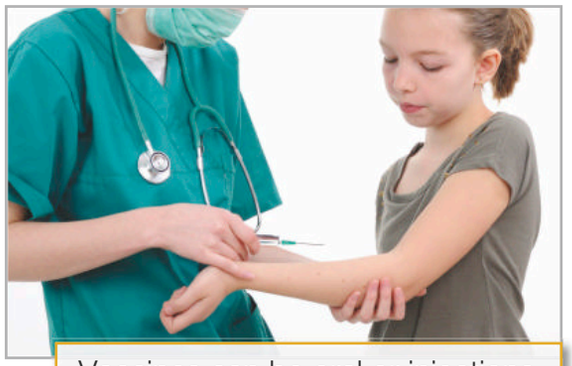
- through the respiratory system, by coughing.
- through the digestive system, by eating contaminated food.
- through wounds and cuts in the skin.

Preventing Infections

It is important to be hygienic by:

- disinfecting wounds.
- washing hands before eating or handling food.
- washing uncooked food.
- covering the mouth when coughing or sneezing.
- not sharing eating utensils.

Wear flip-flops in swimming pools and changing rooms.



Vaccines can be oral or injections.

Vaccines

Vaccines can prevent some illnesses caused by viruses or bacteria.

Vaccines introduce into the body the microorganism or virus that makes us ill. The body reacts to the virus and produces substances to destroy it.

If the microorganism or virus returns, the body will recognize it and fight against it.

Can you...?

Look at the illustrations and answer the question.

Can pathogenic microorganisms enter the bodies in the illustrations? How?

1

2

Underline the correct words to complete the sentences.

a. A vaccine is a substance which *prevents* / *spreads* some illnesses.

b. A vaccination is the *production* / *introduction* of a microorganism or virus into the body.

Treat Infections

When microorganisms enter the body and cause an infection, doctors prescribe different treatments.

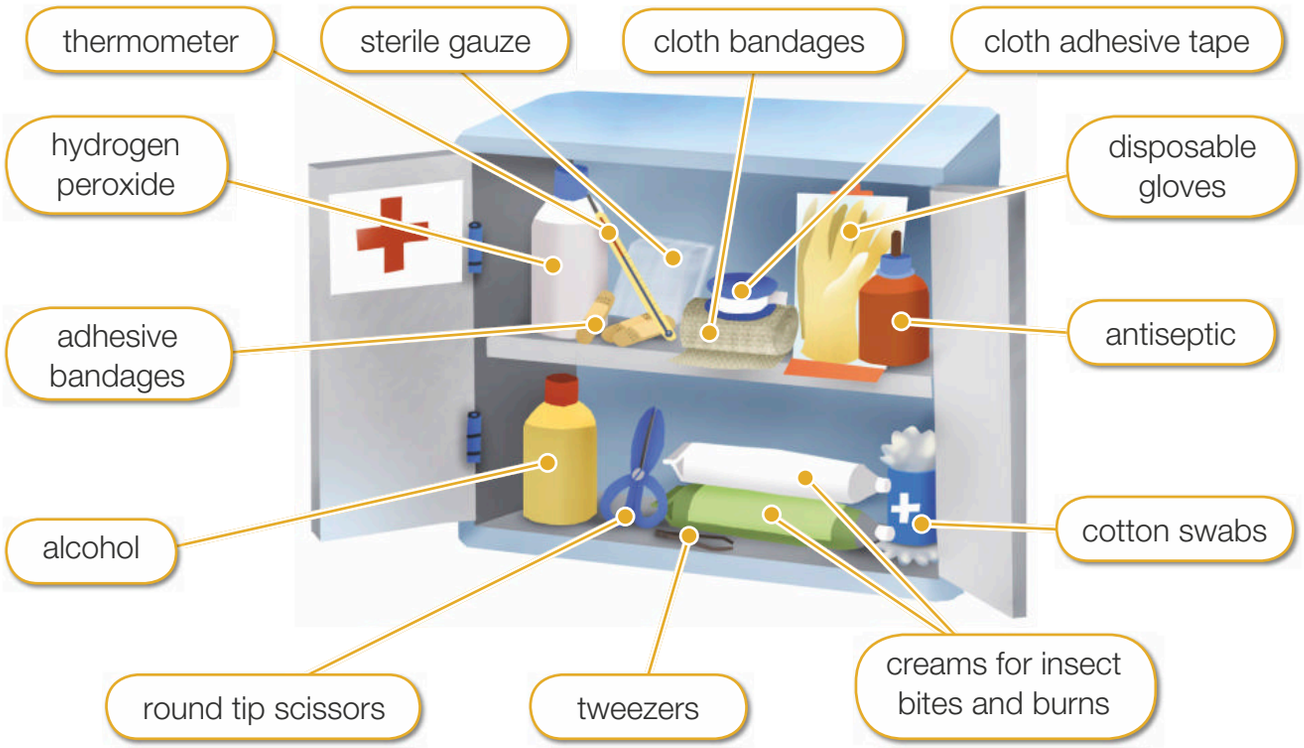
Generally, antibiotics are taken by mouth.

- Infections caused by bacteria are treated with antibiotics.
- Infections caused by fungi are treated with anti-fungal medicines.
- Infections caused by viruses are only treated with medicines that help to reduce symptoms. Doctors can also prevent these infections with vaccines.

First-Aid Kit

It is important to have a first-aid kit at home to treat minor injuries.

It should include the following items:



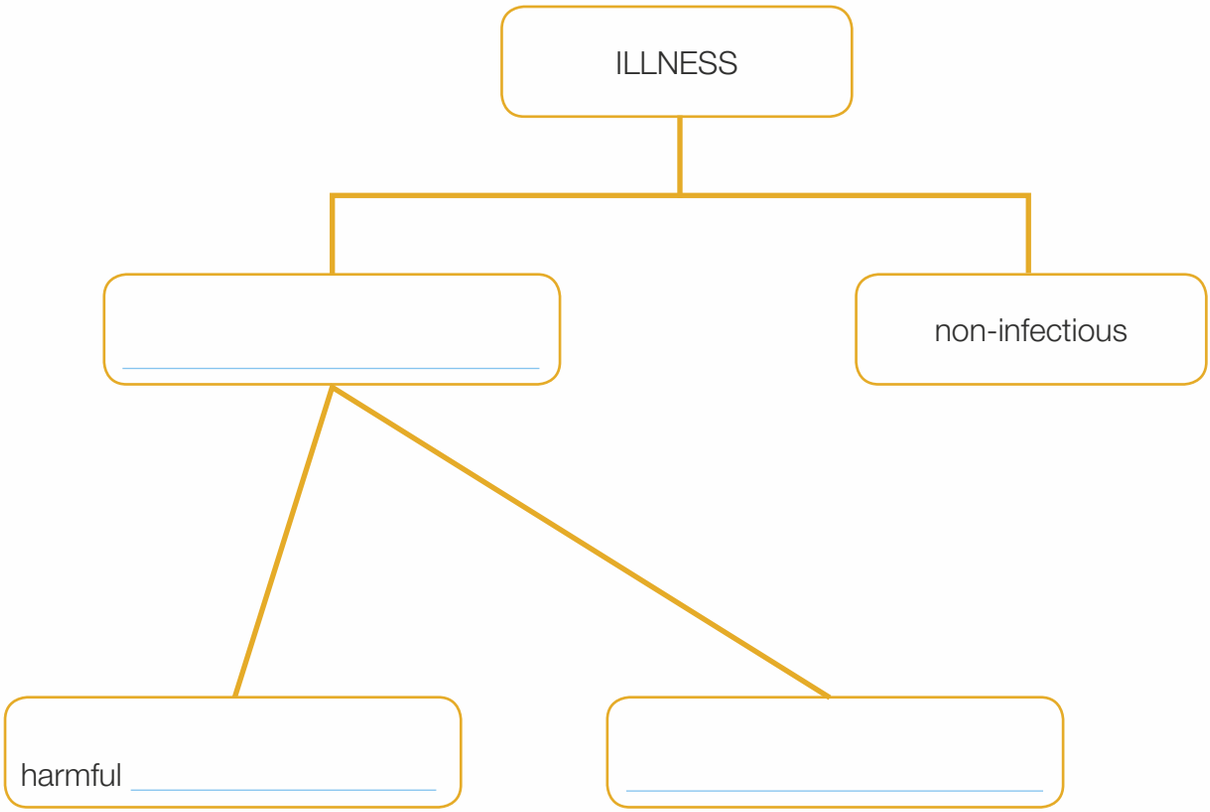
Can you...?

Ask your partner about infectious illnesses.

How do microorganisms enter our body?

In different ways. For example, through the respiratory system…

1. Complete the word map about illnesses.



2. Put a check (✓) next to the healthy habits or a cross (✗) next to the unhealthy habits.

a. sleep for eight or nine hours ____
b. go swimming ____
c. breathe fresh air ____
d. take a shower once a month ____
e. eat lots of candy ____
f. play soccer ____
g. go to bed late ____
h. eat fruit every day ____

3. Match the columns.

problem	treatment
bronchitis •	• medicine to reduce fever
a broken bone •	• antibiotics
flu •	• immobilize the affected area
high temperature •	• stay in bed

4. Write *T* (true) or *F* (false).

a. Illnesses caused by viruses are treated with antibiotics. ____

b. Viruses are pathogenic microorganisms. ____

c. Viruses are microscopic organisms. ____

d. Viruses cause infections. ____

5. Read the text and answer the questions.

Smallpox is a viral illness which killed millions of people in the eighteenth and nineteenth centuries. A massive vaccination program took place all over the world. By the middle of the twentieth century, the illness was eradicated.

Poliomyelitis, or polio, is another serious viral illness. In the past, it caused paralysis in many children and adults. Scientists discovered a vaccine for polio in the 1950s and 60s. Today, polio is much less frequent than before. Scientists hope that they can eradicate it completely in the near future.

a. Which two illnesses are mentioned in the text?

b. Which illness has disappeared?

c. What causes these illnesses?

d. Why is polio less common today?

e. What do scientists want to do about polio?

f. One of the illnesses is also called “infantile paralysis.” Which one?

Choose the best title for the text.

a. No Hope for the Future b. A World Epidemic Is Coming c. Working to Eradicate Illness

2 Sensitivity and Coordination

Let's speak!

- What is the boy doing?
- What do you think he is going to do next?
- Which smells make you feel hungry?

Stimulus and Response

The function of sensitivity is to produce a response to a stimulus that we receive.

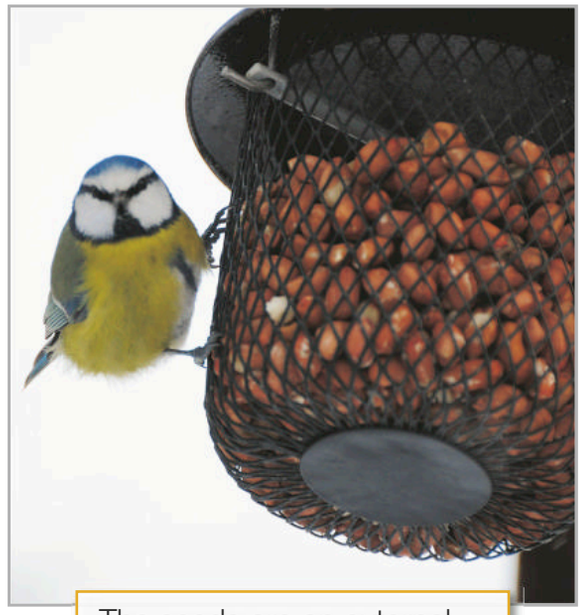
Stimuli

A stimulus is anything you see, hear, touch, smell, or taste. There are two types of stimuli:

- Internal stimuli come from inside the body, such as the feeling of thirst.
- External stimuli come from outside the body, such as the smell of a cake or the texture of something.

The body has different receptors to receive different types of stimuli:

- Internal receptors receive the internal stimuli the body produces. They are all over the body. They stimulate hunger or pain.
- External receptors receive external stimuli. They are in the sensory organs: the eyes, nose, tongue, ears, and skin.



The seeds are an external stimulus to the bird. Hunger is an internal stimulus.

Chewing is a muscular response.

Responses

A response is the body's answer to a stimulus. There are two types of responses:

- Muscular responses are the movements muscles make in response to stimuli.
- Glandular responses occur when glands produce various substances in response to stimuli. For example, sweat glands produce sweat in response to heat.

Can you...?

Ask a partner if these are external or internal stimuli.

- smelling a flower
- feeling tired
- remembering a joke
- touching a dog's fur
- having a toothache
- looking at a glass of water

The Senses

Which sense do you think is the most important?

Sight

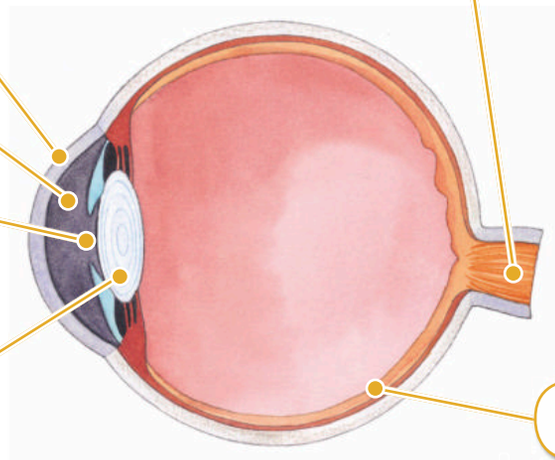
The eye is the organ of sight. The eyeball is part of the eye. The eyebrows, eyelids, and eyelashes protect it.

1 Light goes through the cornea.

iris

2 Light passes through the pupil, the opening of the iris.

3 Light passes through the lens, which focuses the image on the retina.

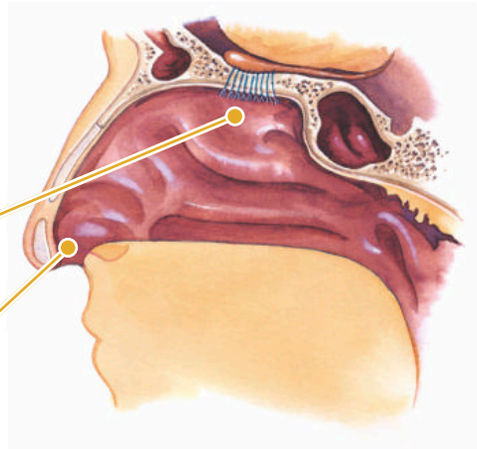


retina

4 Information in the retina travels to the brain through the optic nerve.

Smell

The nose is the organ of smell. The receptors of smell are in the pituitary gland, inside the nostrils.



pituitary

nostrils

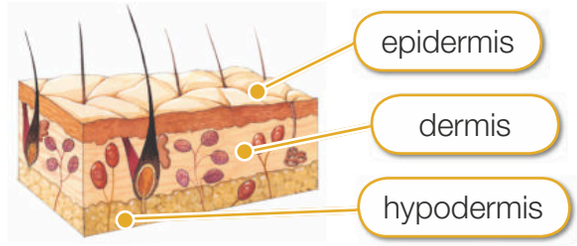
Can you...?

Explain the process of sight to a partner.

First, … Then … After that, … Finally, …

Touch

The skin is the organ of touch. It is made up of three layers: the epidermis, the dermis, and the hypodermis.



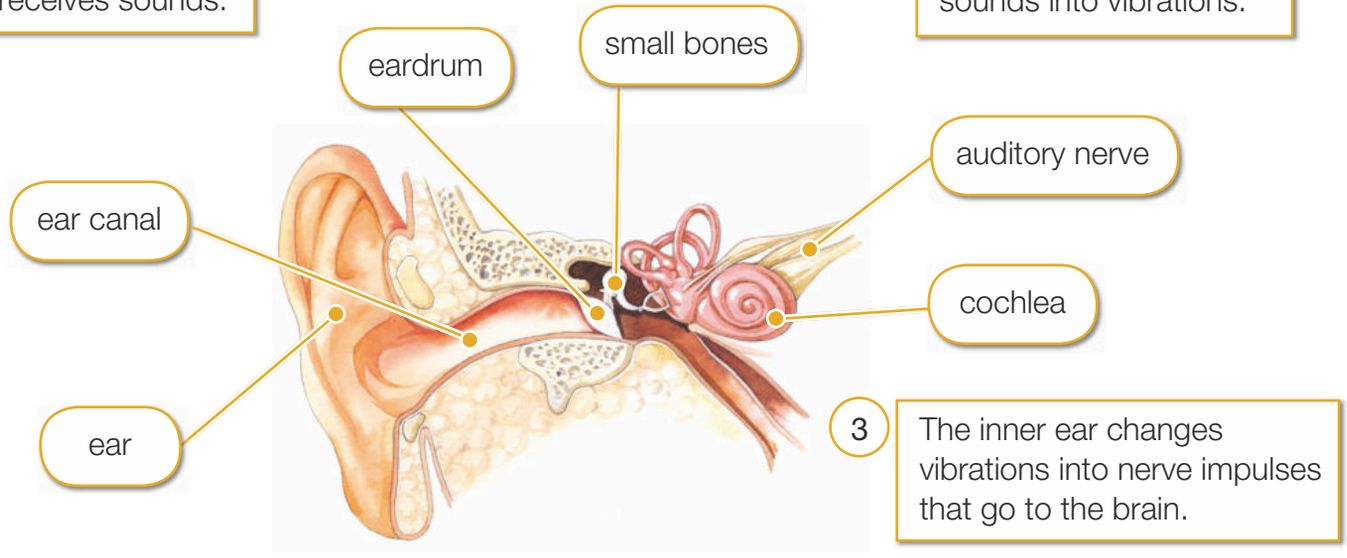
Hearing

The ear is the organ of hearing. It has three parts:

- The outer ear includes the ear and ear canal.
- The middle ear includes the eardrum and the small bones.
- The inner ear includes the cochlea and the auditory nerve.

1 The outer ear receives sounds.

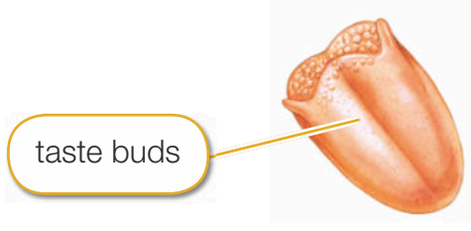
2 The middle ear changes sounds into vibrations.



3 The inner ear changes vibrations into nerve impulses that go to the brain.

Taste

The tongue is the organ of taste. The receptors of taste are in the taste buds. There are taste buds all around the tongue.



Can you...?

Decide with a partner if the sentences are true or false.

- The middle ear changes vibrations into nerve impulses.
- The brain receives nerve impulses.

What is the nervous system?

The nervous system is made up of nerve centers and nerves.

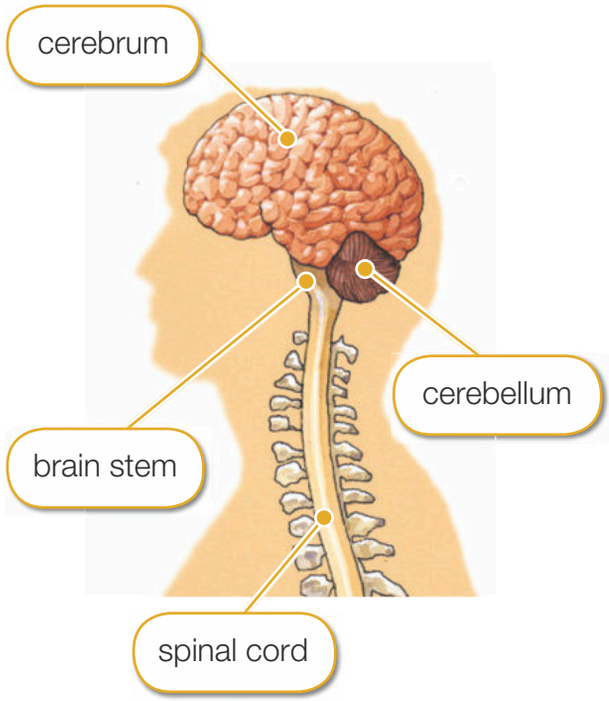
- Nerve centers interpret the information and develop responses. They form the central nervous system.
- Nerves transmit information. This forms the peripheral nervous system.

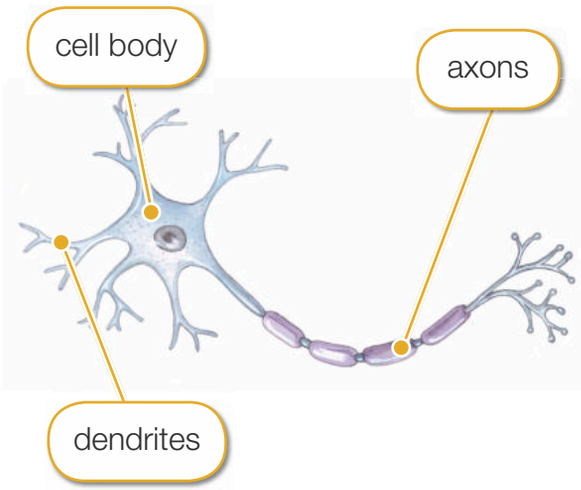
The central nervous system has two parts:

- The brain is inside the skull. It is made up of the cerebrum, the cerebellum, and the brain stem.
- The spinal cord is made up of many neurons. It is protected by vertebrae.

The peripheral nervous system is made up of:

- sensory nerves, which transmit information from the sensory and internal organs to the central nervous system.
- motor nerves, which transmit responses from the central nervous system to the muscles and glands.





Neurons

Both the central and peripheral nervous systems are made up of specialized cells called neurons.

Neurons are made up of a cell body, dendrites, and axons.

Neurons receive information from other neurons through the dendrites and transmit them through the axons.

Can you...?

Complete the sentences.

- The central nervous system is made up of the _____ and _____.
- The peripheral nervous system is made up of _____ and _____ nerves.

Voluntary and Involuntary Movements

The body reacts to stimuli in different ways.

Voluntary Movements

When we see clouds, our sensory nerves inform the brain of this.

Our brain processes the information and produces a response: deciding to look for an umbrella.

Our motor nerves transmit a response to the muscles, making them move to take the umbrella and open it.

Involuntary Movements

The spinal cord produces a response in the case of involuntary movements:

- Sensory nerves transmit information about involuntary movements to the spinal cord.
- The spinal cord produces a very fast response and transmits it to the muscles through the motor nerves.

The cup is hot. The girl touches it and she quickly takes her hand away. The brain does not take part in that decision.

Can you...?

Think of other situations in which you make involuntary movements and share them with a partner.

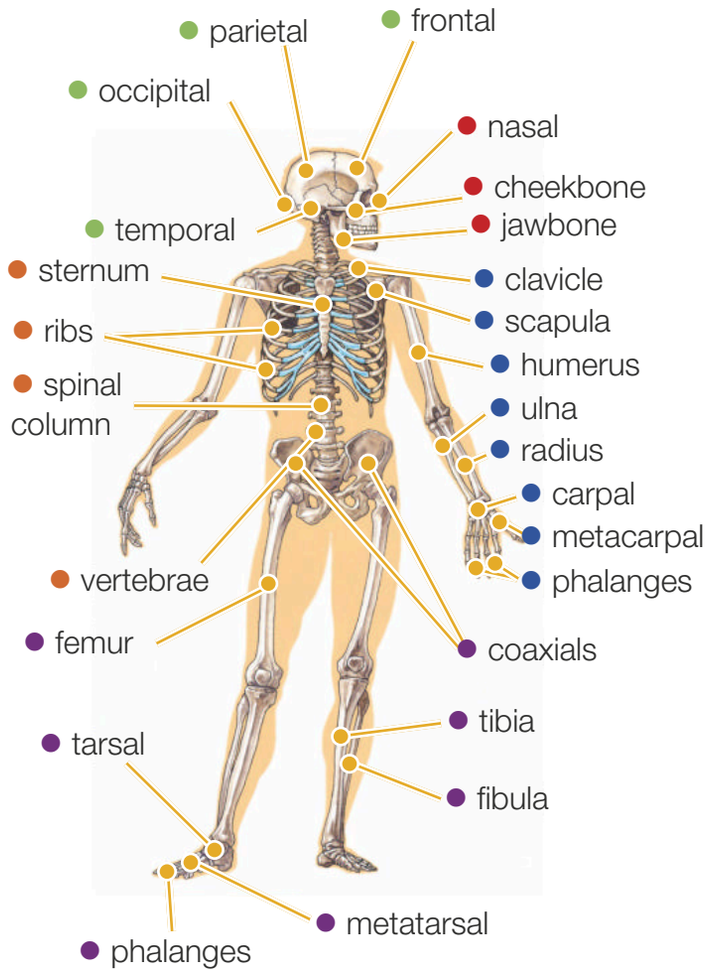
The Skeletal and Muscular System

The skeletal and muscular system carries out muscular responses created by the nervous system. It is made up of the skeleton and the musculature.

The Skeleton

The skeleton is made up of all the bones in the body:

- Head bones. There are two groups: skull bones and facial bones. The skull bones protect the brain.
- Trunk bones. There are two groups: the spine and the rib cage. The spine protects the spinal cord and the rib cage protects the heart and the lungs.
- Limb bones. There are two groups: the upper limb bones and the lower limb bones. The upper limb bones are in the arms and the lower limb bones are in the legs.



Joints

The joints are located where two or more bones meet. Bones are connected by resistant fibers called ligaments.

There are three types of joints:

- Movable joints. The bones can move a lot. The elbow is a movable joint.
- Semi-movable joints. The bones can move a little. The vertebrae are semi-movable joints.
- Fixed joints. The bones are joined and cannot move. The skull is a fixed joint.

Can you...?

Ask a partner questions about the skeleton.

Where is the tibia?

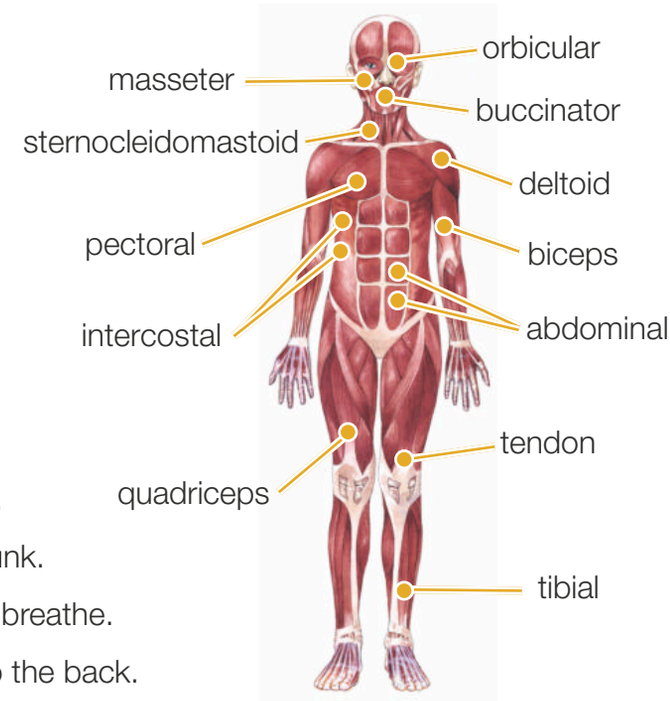
In the lower limb bones.

The Musculature

The musculature is the set of muscles in the body. Locomotor muscles are connected to the bones. When they contract or relax, they move the bones.

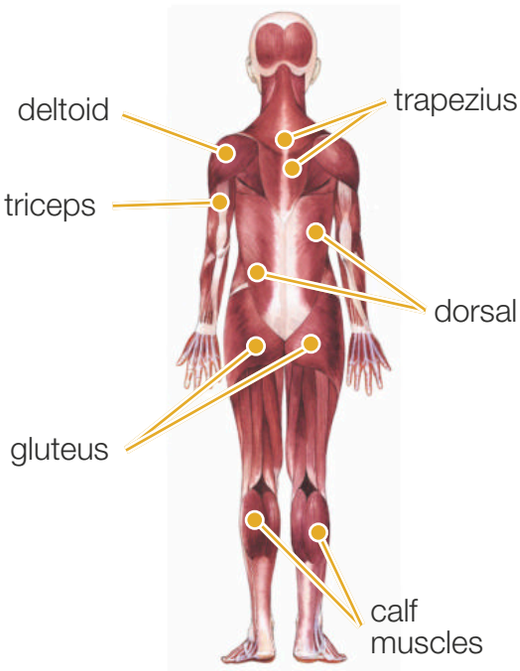
Head Muscles

- The masseter muscles help you to chew food.
- The buccinator muscles help you to open and close your lips.
- The orbicular muscles help you to open and close your eyes.



Trunk Muscles

- The sternocleidomastoid muscles move the head.
- The abdominal and pectoral muscles bend the trunk.
- The intercostal muscles move your ribs when you breathe.
- The trapezius connects the head and shoulders to the back.



Limb Muscles

- The biceps help you to bend your arms, the triceps help you to lower them, and the deltoid helps you to raise them.
- The quadriceps help you to extend your legs, the gluteus helps you to move them, and the calf muscles help you to extend the feet.

Tendons

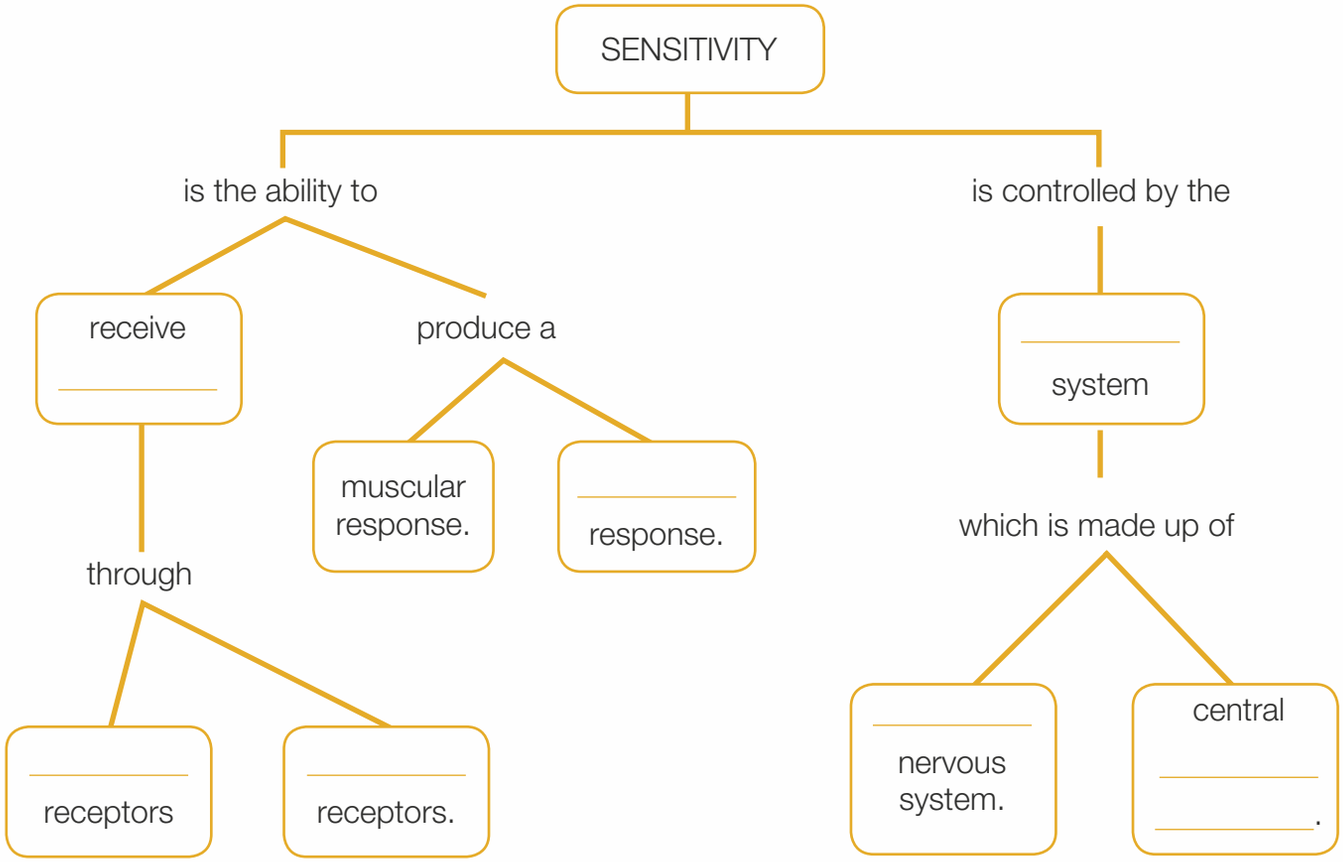
Tendons are made of flexible and fibrous tissue. They connect muscles to bones. They cannot contract or relax like muscles.

Can you...?

Complete the sentence.

The muscles of the body are in the _____, _____, and _____.

1. Complete the word map about sensitivity.



2. Write the name of the sense organs.

a. It has three parts: the outer, middle, and inner part. _____

b. It has three layers, the dermis, epidermis, and hypodermis. _____

c. Light enters it through the cornea. _____

d. There are taste buds all over it. _____

e. It has a pituitary gland. _____

3. Read and write *stimuli* or *response*.

a. You see a friend. _____

b. You laugh at a joke. _____

c. You smell a cake. _____

d. You listen to a song. _____

e. You feel hungry. _____

4. Match the stimuli and responses. Write *G* (glandular) or *M* (muscular) next to each answer.

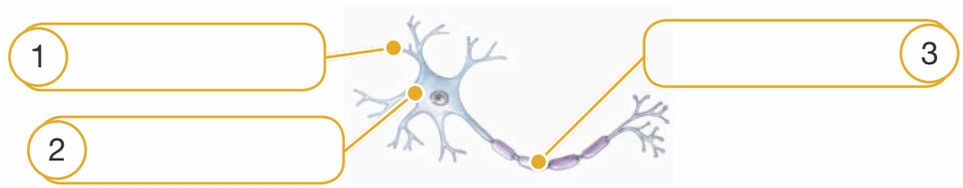
We feel sleepy. •	• We scratch it. _____
We touch a hot plate. •	• We open our mouths to yawn. _____
We cut an onion. •	• Saliva comes into our mouth. _____
We smell fresh bread. •	• We take our hand away quickly. _____
Our arm feels itchy. •	• We get tears in our eyes. _____

5. Read and complete the text.

type • shapes • microscope • purpose • cells

Our body is made up of lots of (a) _____, but they are not all the same. Each (b) _____ of cell has a different (c) _____. The cells also have different (d) _____. We need a (e) _____ to see cells properly.

6. Label the parts of the neuron.



7. Match the bones to the corresponding parts of the body.

jawbone •	• foot
vertebrae •	• head
humerus •	• leg
femur •	• back
metatarsal •	• arm

8. Unscramble the words to answer the questions.

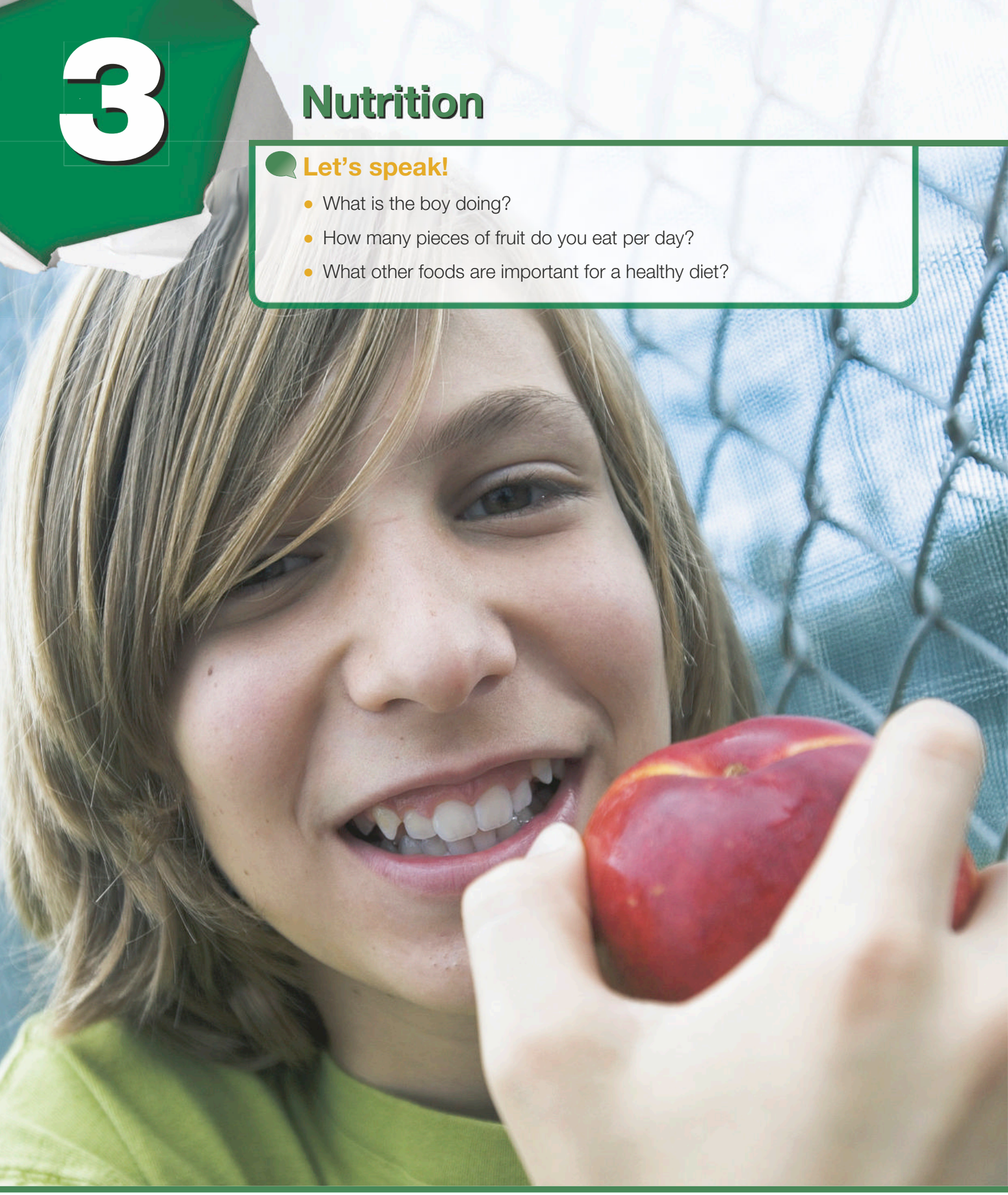
a. Which muscles help you to chew food? STESEMAR _____

b. Which muscle bends the arm? SPEBIC _____

c. Which muscles bend the trunk? DABALNIMO _____

d. Which muscles open and close the eyes? RALUCIBRO _____

3 Nutrition



Let's speak!

- What is the boy doing?
- How many pieces of fruit do you eat per day?
- What other foods are important for a healthy diet?

Nutrition

The function of nutrition is essential to life. Nutrients give cells all the energy they need.

The digestive system, the respiratory system, the circulatory system, and the excretory system carry out the function of nutrition.

The Digestive System

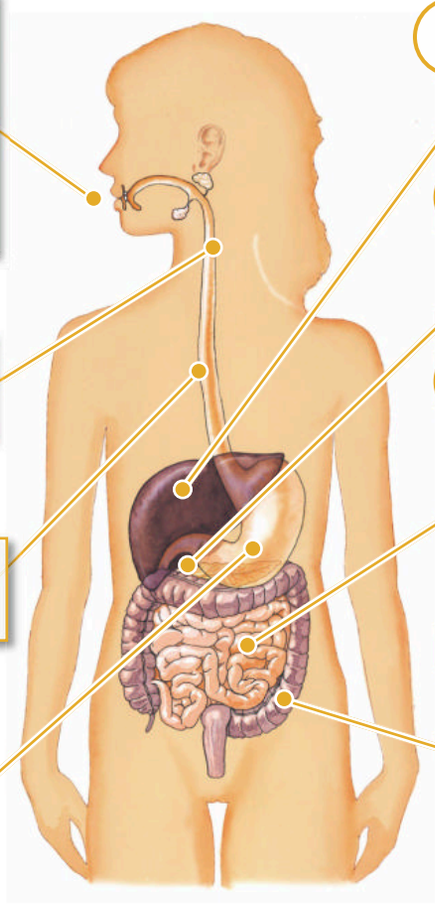
The digestive system transforms food into nutrients. It has two parts: the digestive tract and the digestive glands. Food moves all through the digestive tract while salivary glands release chemicals into the digestive tract to help with digestion.

1 The mouth has salivary glands that produce saliva, teeth that chew food, and a tongue that mixes chewed food with saliva to form a ball of food.

2 The pharynx connects the mouth and oesophagus.

3 The oesophagus transports the food to the stomach.

4 The stomach is where the food mixes with gastric juices.



5 The liver secretes bile.

6 The pancreas helps in the digestion of proteins.

7 The small intestine is the longest part of the digestive tract. Nutrients pass into the blood through its walls.

8 The large intestine absorbs water, which passes to the blood. Finally, undigested substances are expelled through the anus.

Can you...?

Ask true or false questions to test your partner.

The mouth is part of the digestive tract.

True.

The Respiratory System

The respiratory system is in charge of breathing. Breathing involves two movements:

- First, you inhale air and it goes into the lungs.
- Then you exhale air and send it out of the lungs.

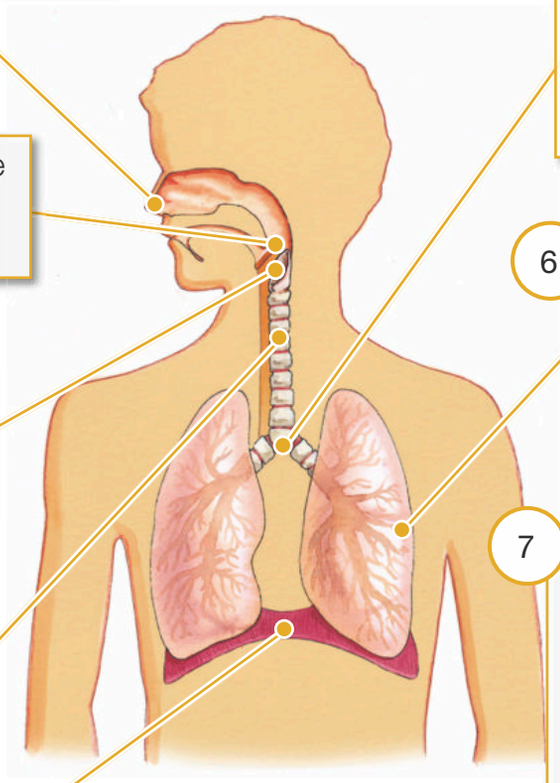
The diaphragm is the muscle that makes the movements involved in breathing.

1 The nostrils are two openings in the nose. They filter the air that you breathe.

2 The pharynx connects the larynx, the oesophagus, and the trachea.

3 The larynx contains the vocal cords. They produce sound.

4 The trachea is a tube that takes air into the bronchi.



diaphragm

5 The bronchi are two branches of the trachea. They take air to the lungs.

6 The lungs are spongy organs made up of small sacs called alveoli.

7 When you breathe, the oxygen in the air goes to the blood through the alveoli, and the carbon dioxide from the blood is released outside the body.

Can you...?

Answer the question with a partner.

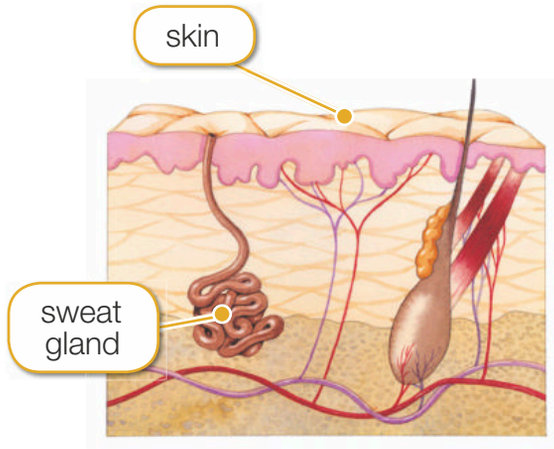
Is the air that you inhale different from the air that you exhale?

The Excretory System

The excretory system filters waste substances from the blood. It removes them from the body through excretion.

The excretory system is made up of:

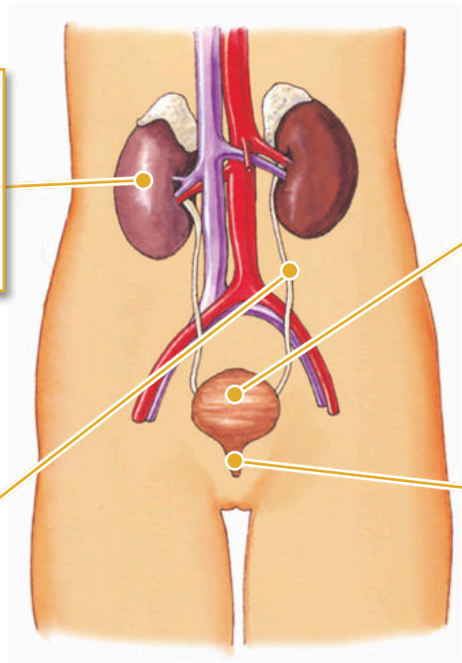
- sweat glands in the skin. They produce sweat.
- the urinary system. This is made up of the kidneys and the urinary tract.



The Urinary System

1 The kidneys are on both sides of the spinal column. They remove waste substances from the blood and make urine.

2 The ureters take urine from the kidneys to the bladder.



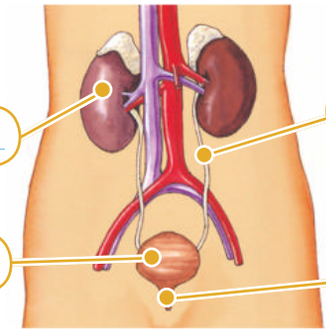
3 The bladder stores urine.

4 The urethra connects the bladder to the outside.

Can you...?

Answer the question and label the excretory system.

Which waste substances does the excretory system remove from our bodies?



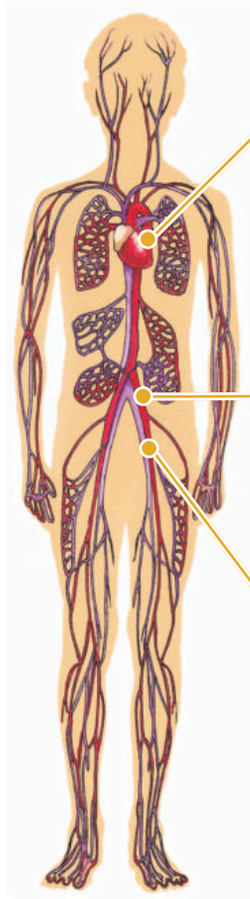
The Circulatory System

The circulatory system transports nutrients and oxygen to the cells. It is made up of the heart, blood, and blood vessels.

The blood vessels are the tubes through which blood circulates. The arteries, the veins, and the capillaries are blood vessels.

The blood collects oxygen from the alveoli and nutrients from the small intestine and transports them to all the cells. It also collects waste substances and takes them to the sweat glands and the urinary system.

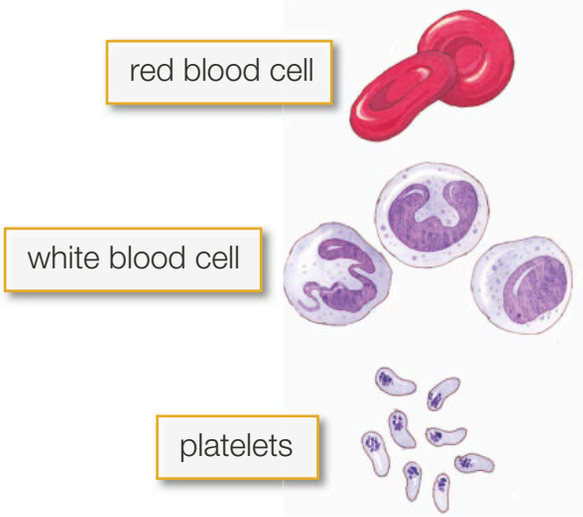
The capillaries are very thin vessels that reach all the cells of the body.



The heart is a muscular organ that pumps blood around the body.

The arteries carry blood from the heart to the rest of the body.

The veins carry blood from all over the body back to the heart.



The Blood

Blood is a red liquid made up of cells that float in a liquid called plasma.

There are three types of blood cells: red blood cells, white blood cells, and platelets.

- Red blood cells carry oxygen.
- White blood cells remove bacteria and viruses from the blood.
- Platelets are small fragments of cells that form blood clots when a blood vessel breaks.

Can you...?

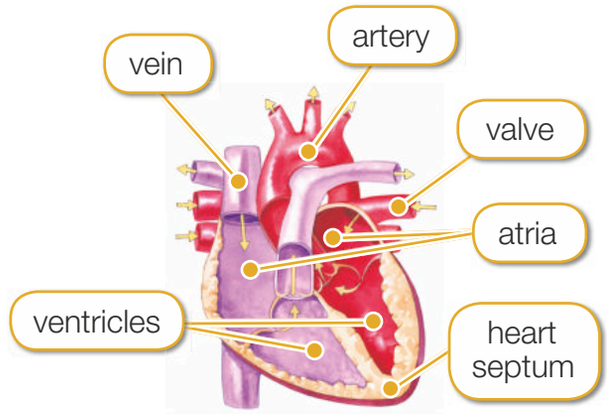
Answer the question.

What is the difference between veins and arteries?

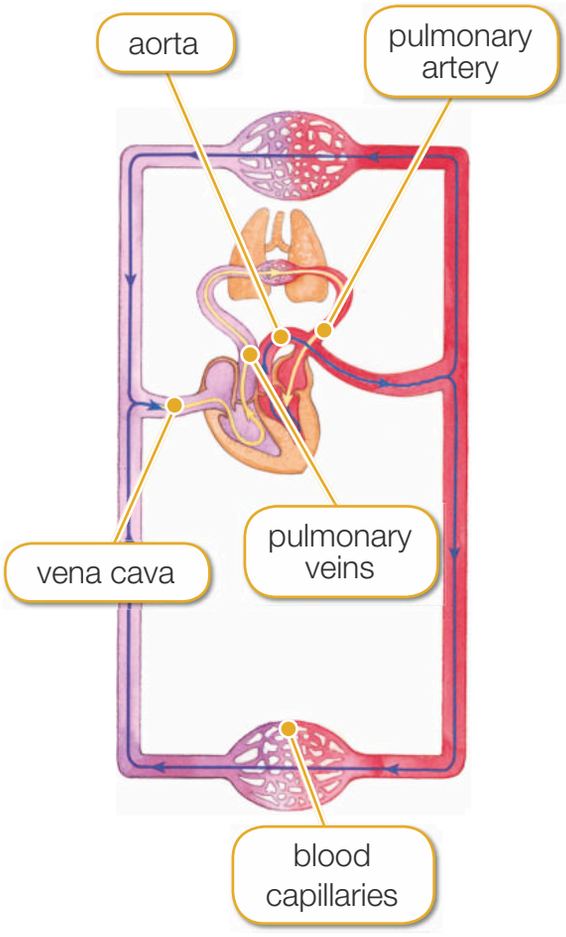
The Heart

The heart uses two rhythmic movements to pump blood around the body. Systole is the movement of contraction. Diastole is the movement of relaxation.

Blood enters the atria through veins and passes to ventricles. Between the atria and the ventricles, there are valves that prevent blood from flowing back to the atria. Blood comes out of the ventricles through the arteries and travels throughout the body.



The heart is divided into four cavities, two atria, and two ventricles.



Human Circulation

Human circulation is closed. In mammals, the heart septum separates the two halves of the heart. This prevents blood containing oxygen from mixing with blood carrying carbon dioxide.

Human circulation is a dual process. Blood follows two routes:

- Pulmonary circulation. Blood containing carbon dioxide comes out of the right ventricle through the pulmonary artery.

  Then, in the alveoli, the blood releases carbon dioxide and takes in oxygen.

  Finally, blood containing oxygen reaches the heart's left atrium through the pulmonary veins.

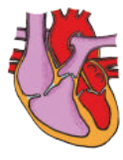
- Systemic circulation. Blood containing oxygen leaves the left ventricle through the aorta.

  Then blood distributes oxygen to all the cells of the body through blood capillaries and collects carbon dioxide.

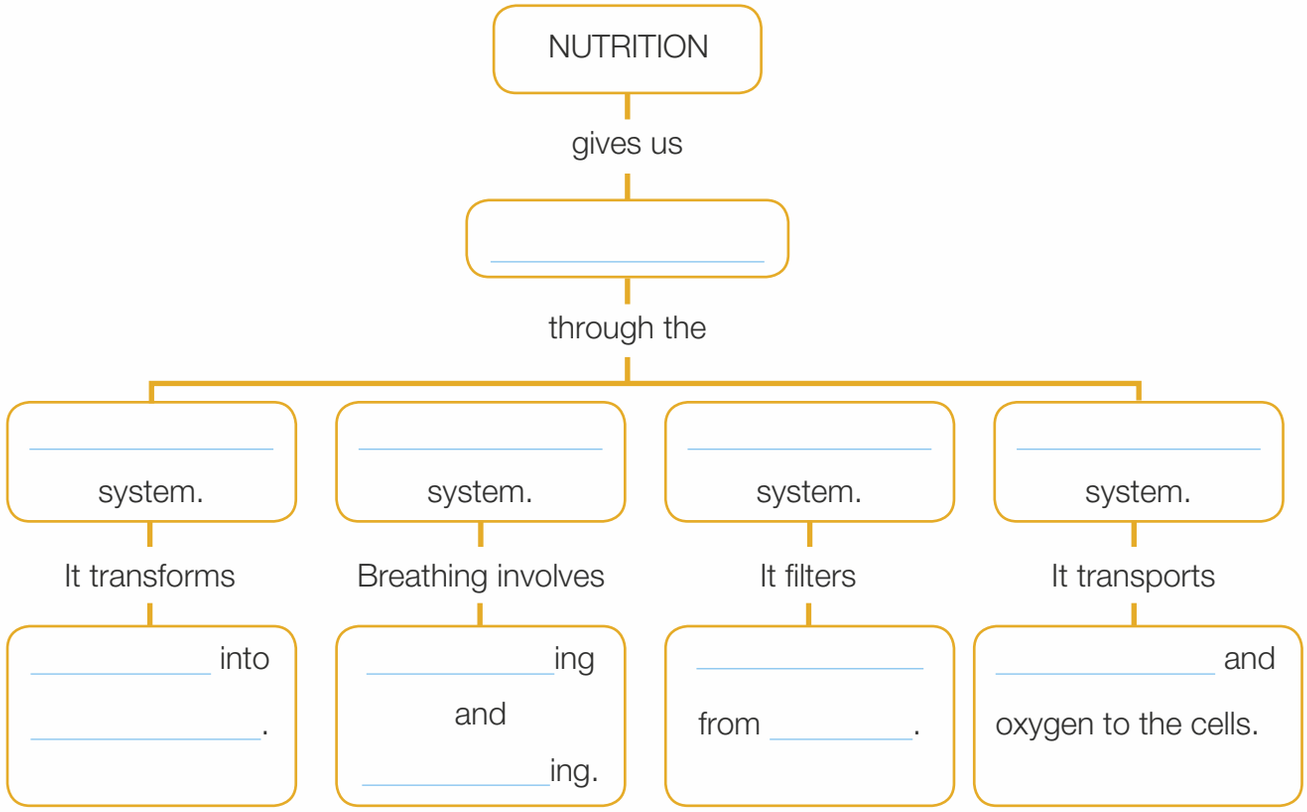
  Finally, blood containing carbon dioxide returns to the heart. It reaches the right atrium through the vena cava.

Can you...?

Explain to a partner how blood moves around the heart.



1. Complete the word map about nutrition.



2. Which body system is described? Complete the sentences.

a. It is in charge of circulation. The _____ system.

b. It is in charge of excretion. The _____ system.

c. It is in charge of breathing. The _____ system.

d. It is in charge of digestion. The _____ system.

3. Complete the text using the verbs below.

eliminates • transports • expels • involves • changes

a. The respiratory system takes oxygen from the air and _____ carbon dioxide.

b. Breathing _____ two processes: lung ventilation and the exchange of gases.

c. The excretory system _____ waste substances carried by the blood.

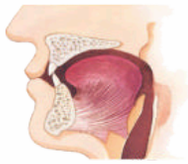
d. The circulatory system _____ nutrients and oxygen to the body's cells.

e. The digestive system _____ food into nutrients.

4. Label these organs.

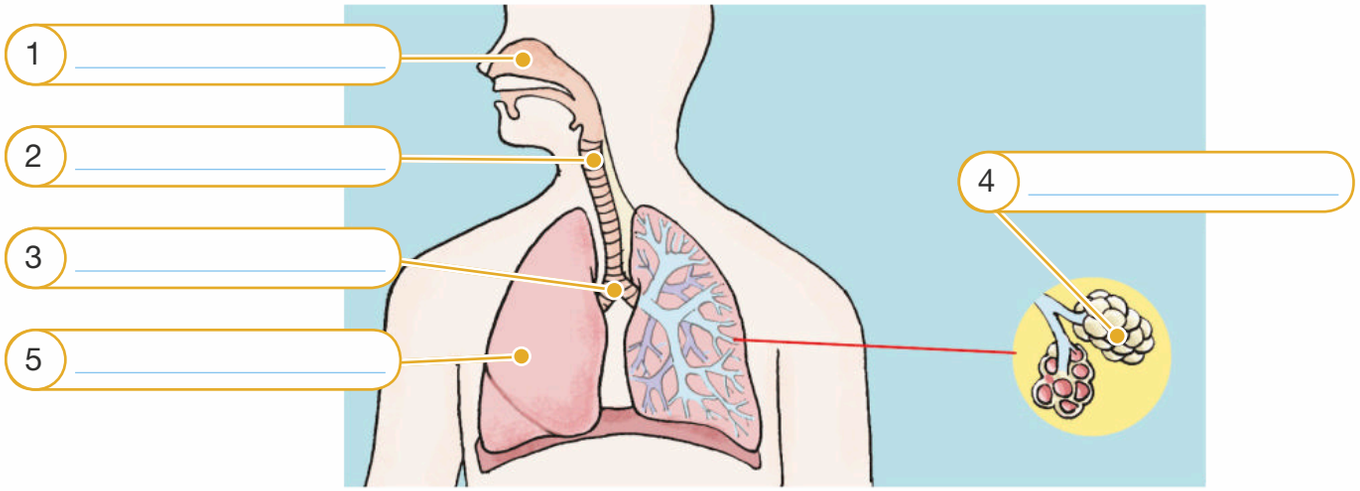
a 

b 

c 

d 

5. Label the parts of the respiratory system.



6. Match the two halves of the sentences.

Blood circulates •	• defend the body.
Platelets •	• is a muscular organ.
White blood cells •	• form blood clots.
The heart •	• are cavities in the heart.
The atria •	• separates the two halves of the heart.
The septum •	• through blood vessels.

7. Decide with a partner if the sentences are true or false.

a. Donating blood can save lives. _____

b. To be a blood donor you must be healthy. _____

c. Children can donate blood. _____

d. During a blood transfusion, the patient receives blood from another person. _____