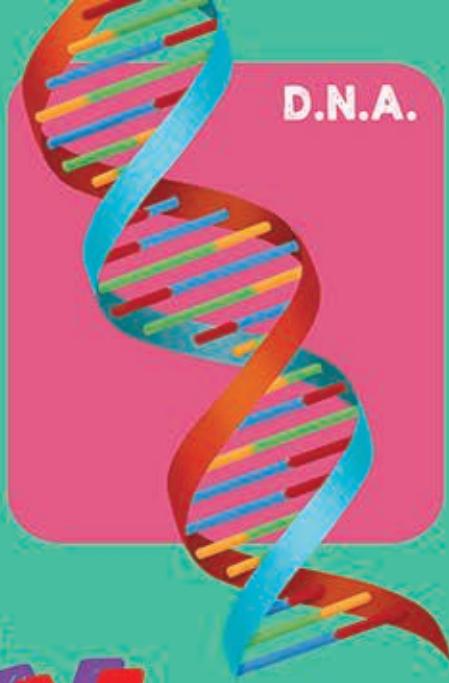
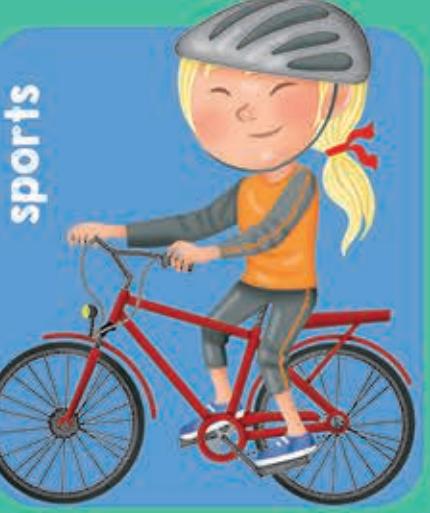
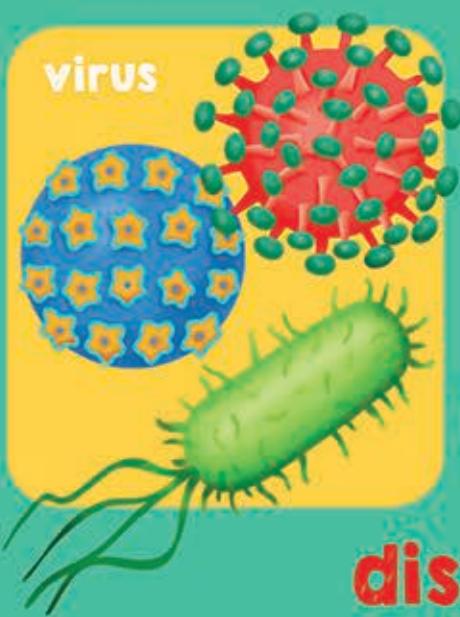
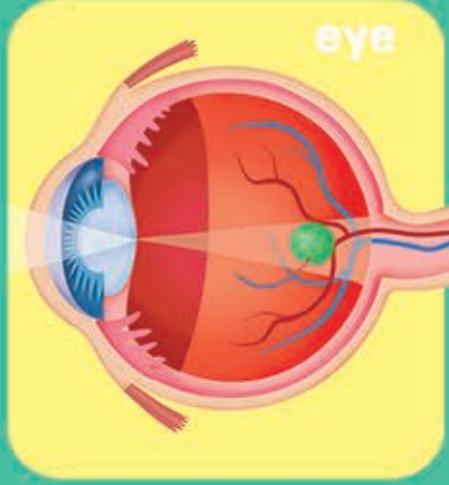
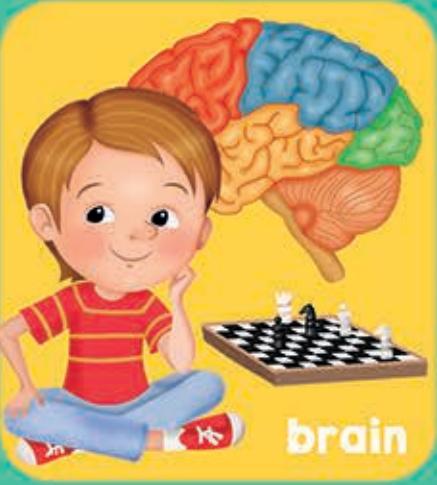
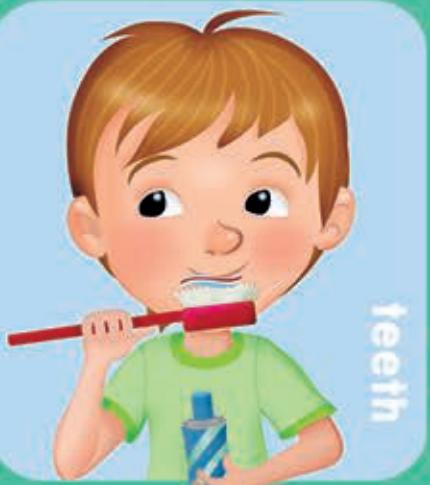
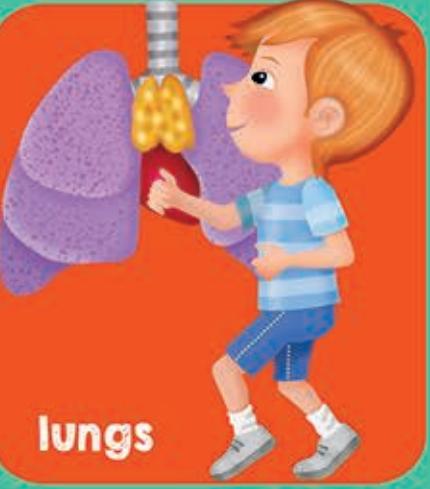
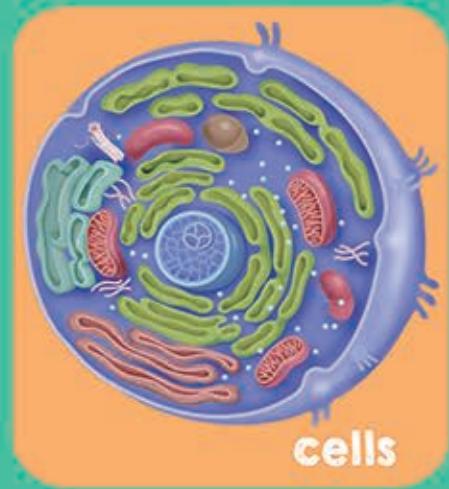
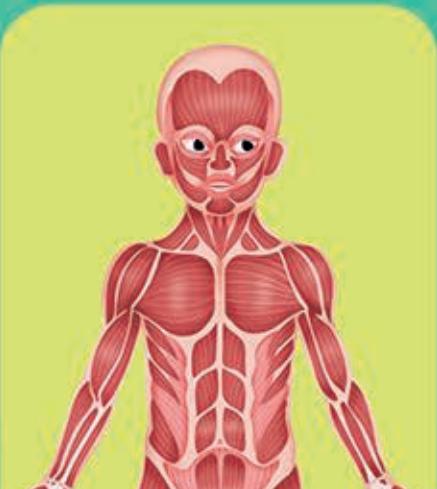
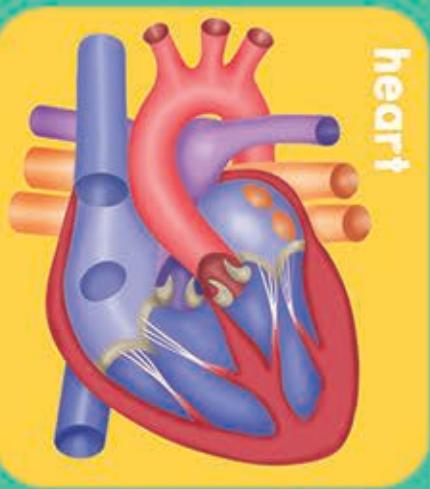


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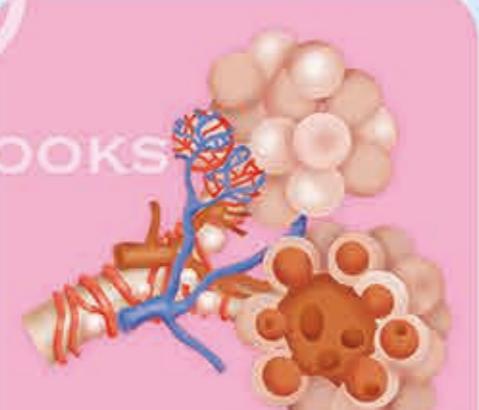
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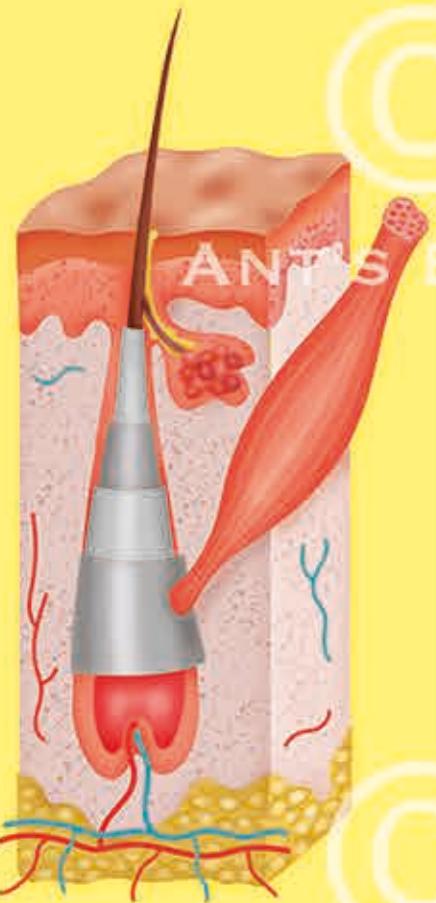
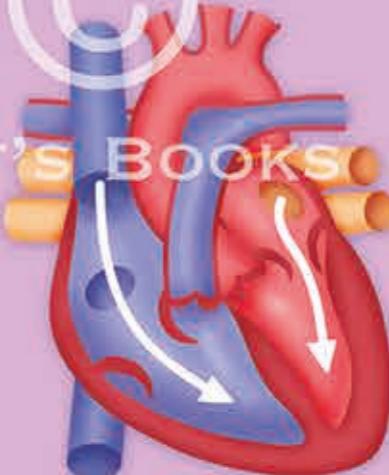


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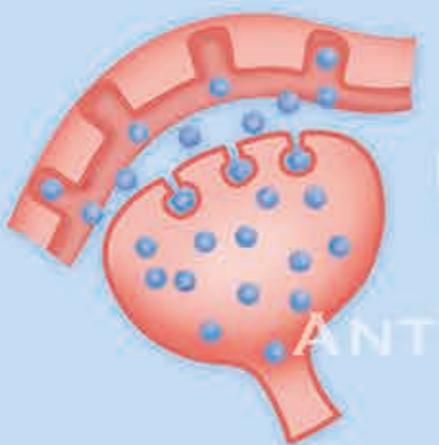


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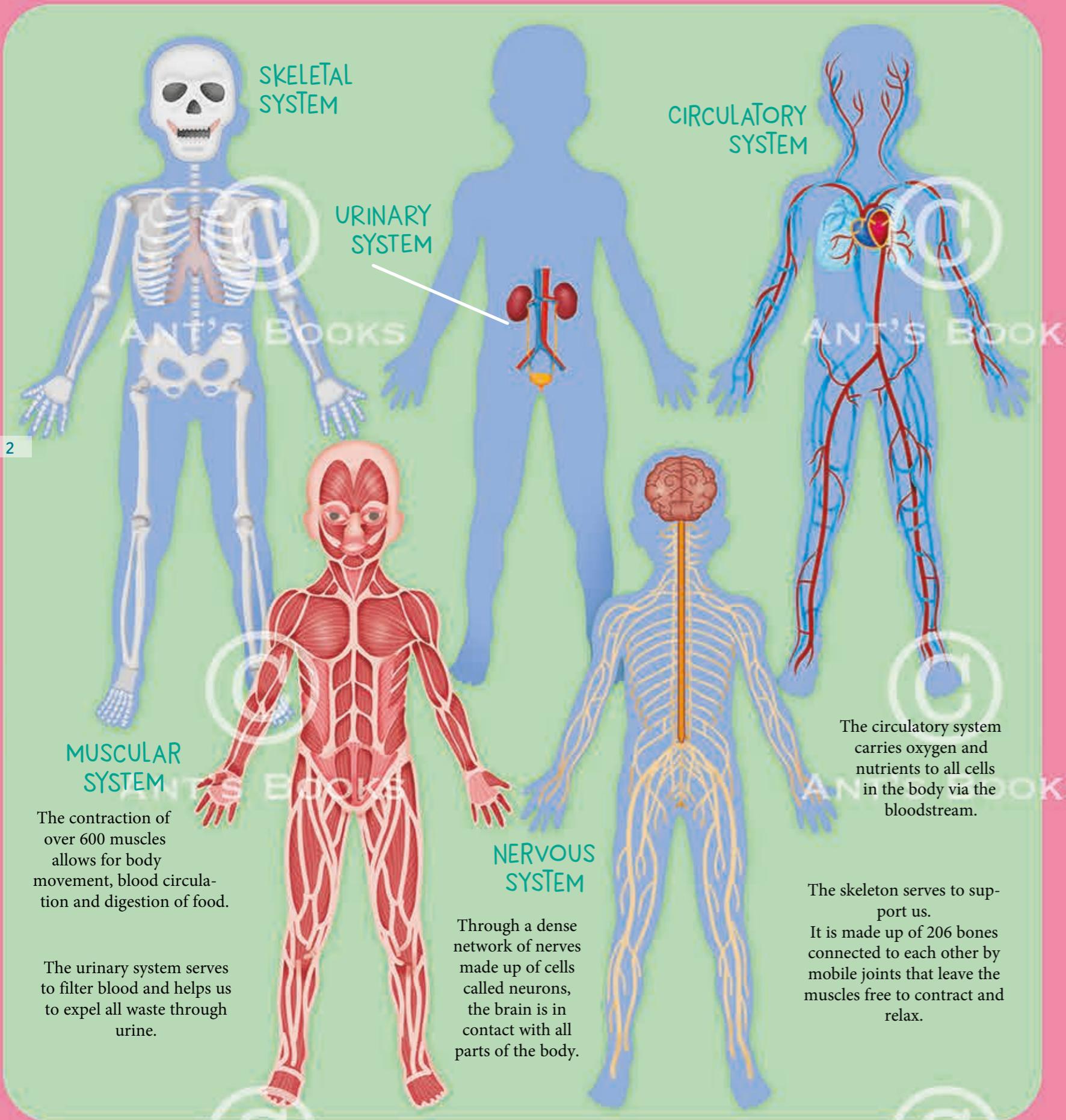
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# OUR BODY

ANT'S BOOKS

The human body is made up of billions of tiny elementary particles called cells. Those of the same type connect to each other to form the organs and systems that allow the entire organism to function.



BRAIN

The brain is a very complex control organ. Its commands are transmitted through the nervous system and allow us movement, thought and all activities essential for life.

The delicate internal organs such as the heart, liver, the lungs are enclosed by the rib cage, a resistant "protective cage" formed by the ribs.

HEART

LIVER

BLADDER

We all started our life with a single cell containing the instructions inherited from mom and dad.

This first cell has multiplied until we become what we are.

ANT'S BOOKS

CELL

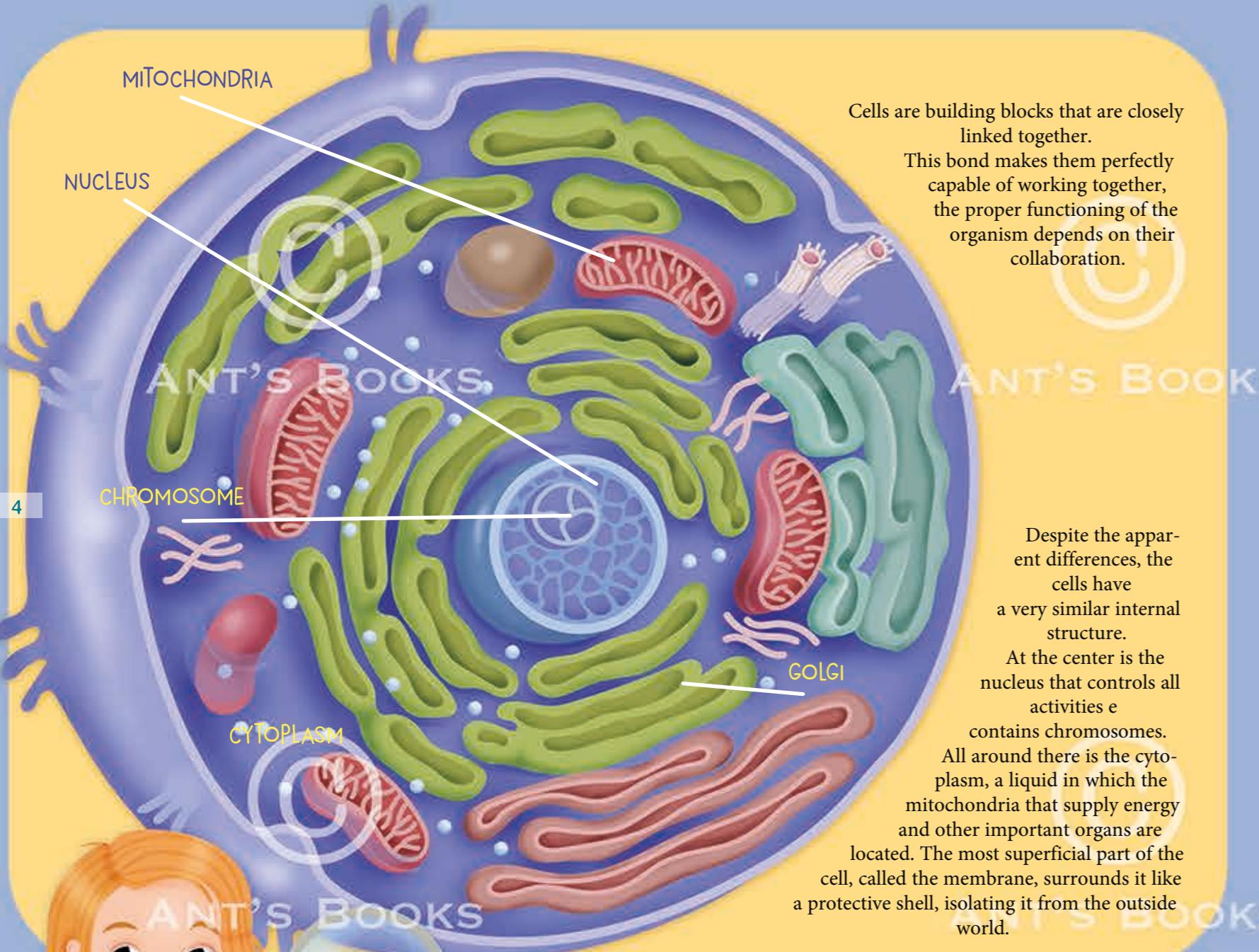


Each cell contains within itself the instructions to reproduce. They are found in a particular molecule called DNA where the genes capable of creating our body are stored.

# THE CELLS THE "LITTLE BRICKS"

## ANT'S BOOKS

The size of cells, even the largest ones, is so tiny that they are only visible when viewed under a microscope.



Before the cell divides, making two copies of itself, each chromosome duplicates itself to form two identical strands.

## CELL DIVISION

The cells belong to over 200 different types.

According to the task they have to perform, they have forms and different sizes. Some are long and thin, others have no core.

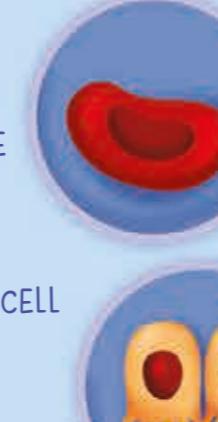
## RED GLOBULE

## BONE CELL

## SKELETAL MUSCLE CELL



## CELL NERVOUS SYSTEM



## MANY DIFFERENT CELLS

## ANT'S BOOKS

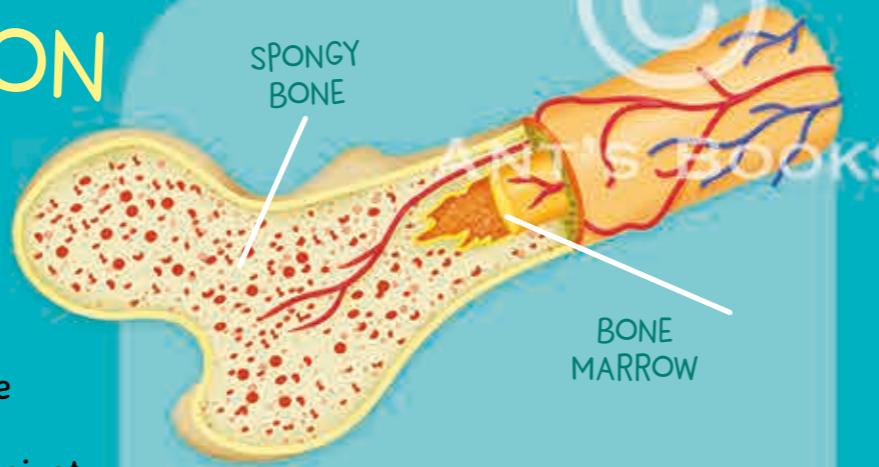
# BONES AND SKELETON

The bones of the skeleton support the body by giving it shape as well as providing protection to the internal organs.

They are joined together by joints that allow movement thanks to the contractions of the muscles.

There are around 400 of these pivot points in the body, many of which are reinforced with strong ligaments that prevent the bones from falling apart.

The joints are not all the same, some are only partially mobile, while others are much more "articulated".



Bones are made up of particular cells combined with mineral salts. The outer part is very hard and resistant, for the same weight it is stronger than steel.

Under this layer there are many small cavities that serve to lighten the structure and make it more elastic.

These spaces are filled with bone marrow capable of producing blood cells



Some parts of the body, such as the nose, are supported by a strong, flexible tissue called cartilage.



The inside of the ear contains three ossicles that transmit sounds. They are the smallest in the human body.

The skull is a hard shell that protects the brain. It is made up of 21 firmly joined bones plus the jaw which is mobile to allow us to chew, breathe and speak.

Hands and feet contain more than half of the bones. Those of the hands are pliable with many joints, those of the feet are sturdy and resistant.

SKULL

CLAVICLE

RIB CAGE

VERTEBRAL COLUMN

HOMER

RADIUS

ULNA

HIP BONE

FEMOR

FIBULA

TIBIA

The spine is a very strong and flexible chain of bones that supports the head and upper body. Among its tasks is the protection of the spinal cord.

6

In pivot joints, a bone is inserted and rotates within another bone.



PIVOT JOINT



HEMISPERIC JOINT

In hemisphere joints the rounded extremities adapt to a wide range of motion.

The hinged joints work like the hinges of a door

The saddle ones allow for forward and backward movements.



GINGLIMO JOINT

SADDLE JOINT

ELLIPSOIDAL JOINT

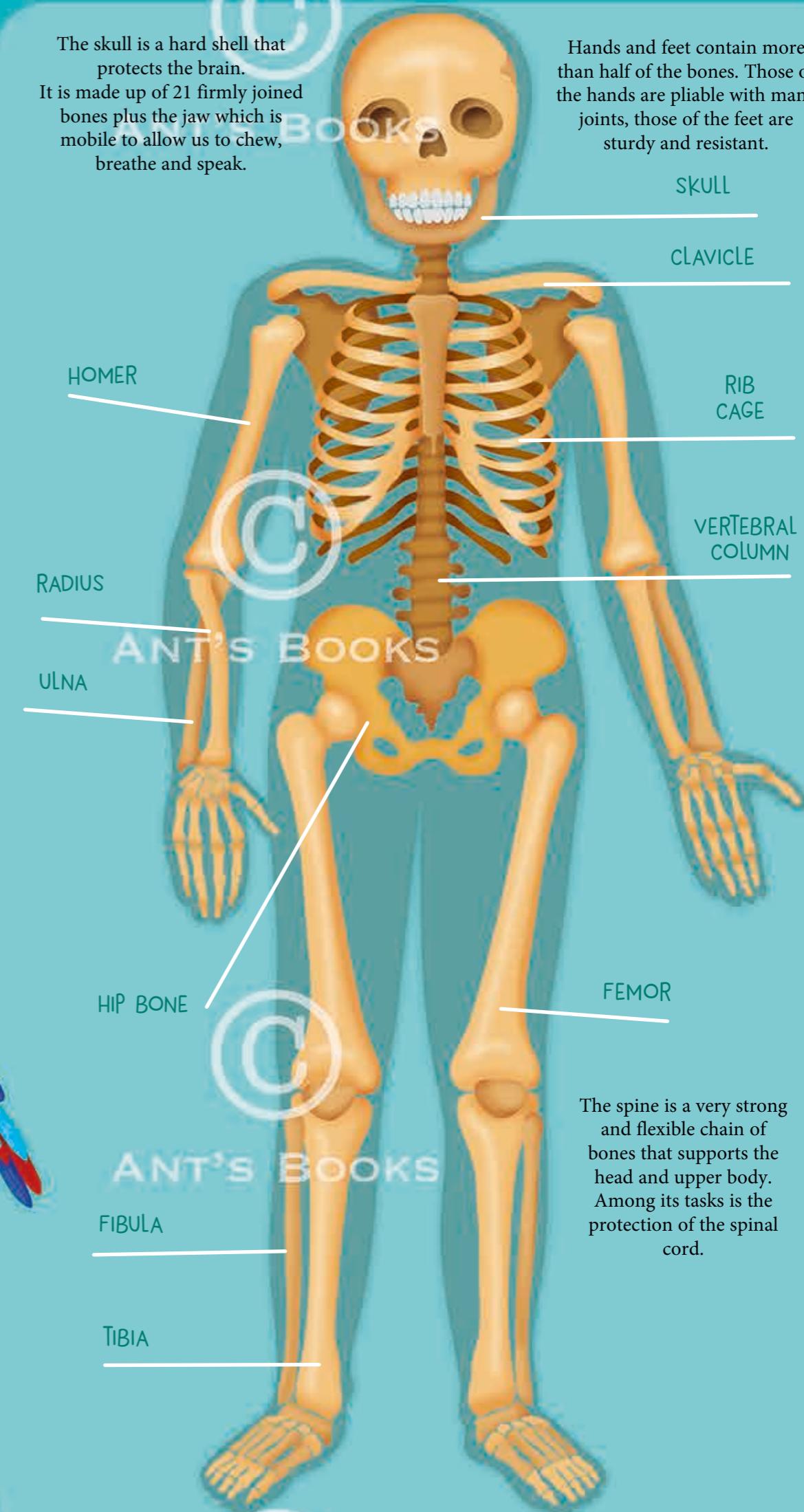
The ellipsoidal ones leave freedom of rotation.

FLAT JOINT

The flat bones of the flat joints allow only small movements.



To fly, birds need a lighter skeleton than ours. For this reason their bones are much hollow.



7

# THE MUSCLES

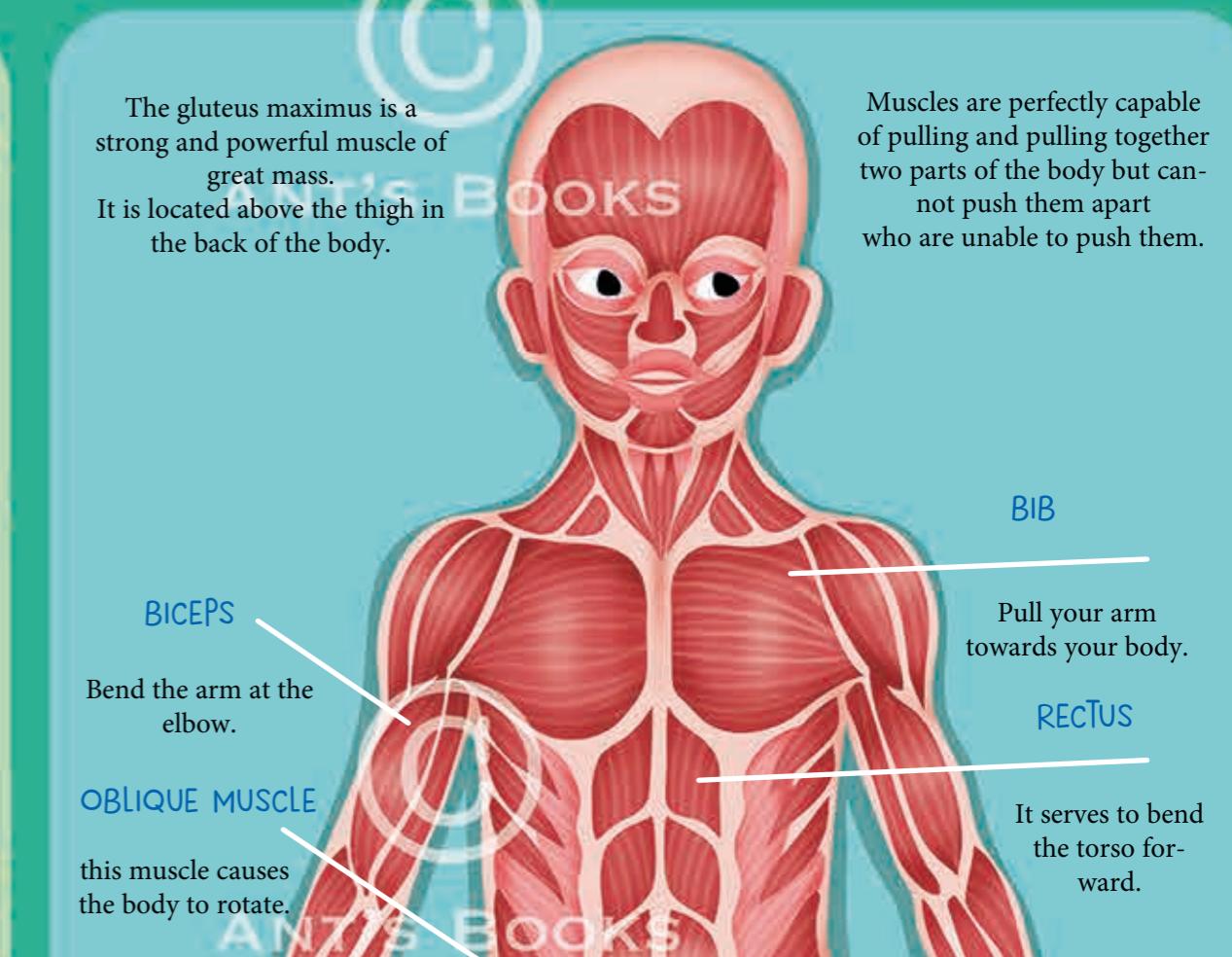
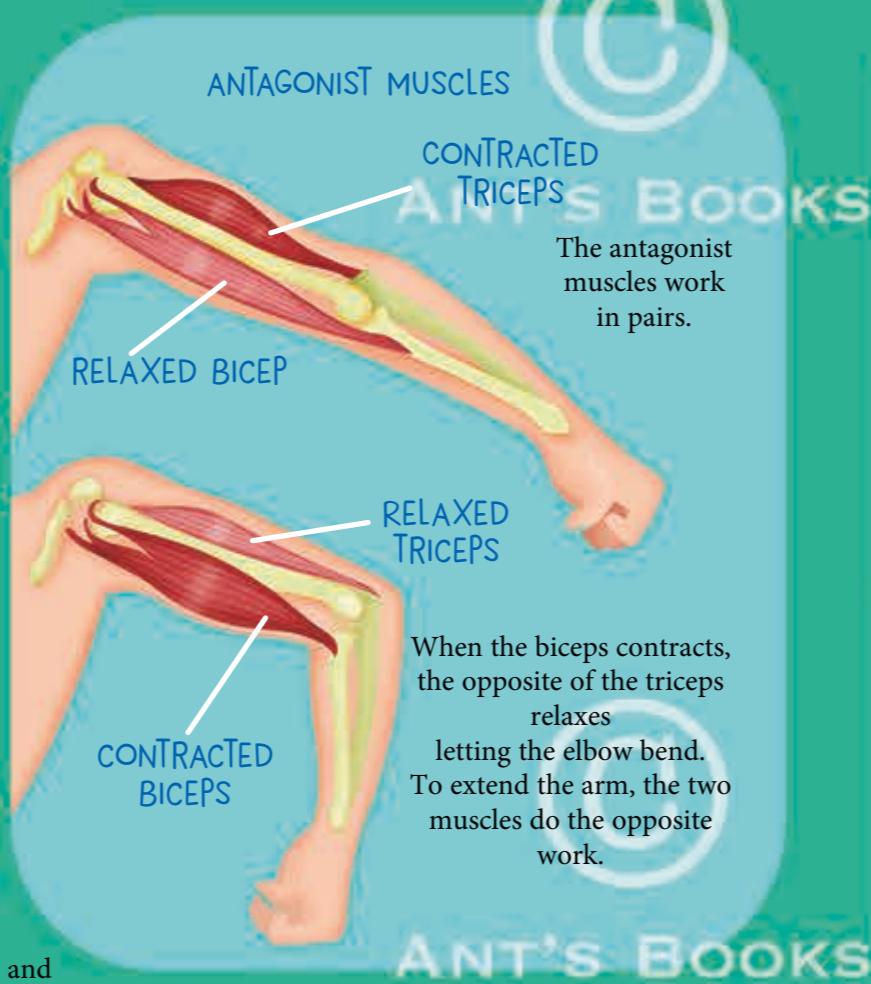
The movements of the body depend on the work of over 650 muscles which make up almost half of the body weight.

Most of the muscles cover the bones of the skeleton, thanks to their ability to shorten and lengthen they allow us to run, jump or simply open and close our eyes.

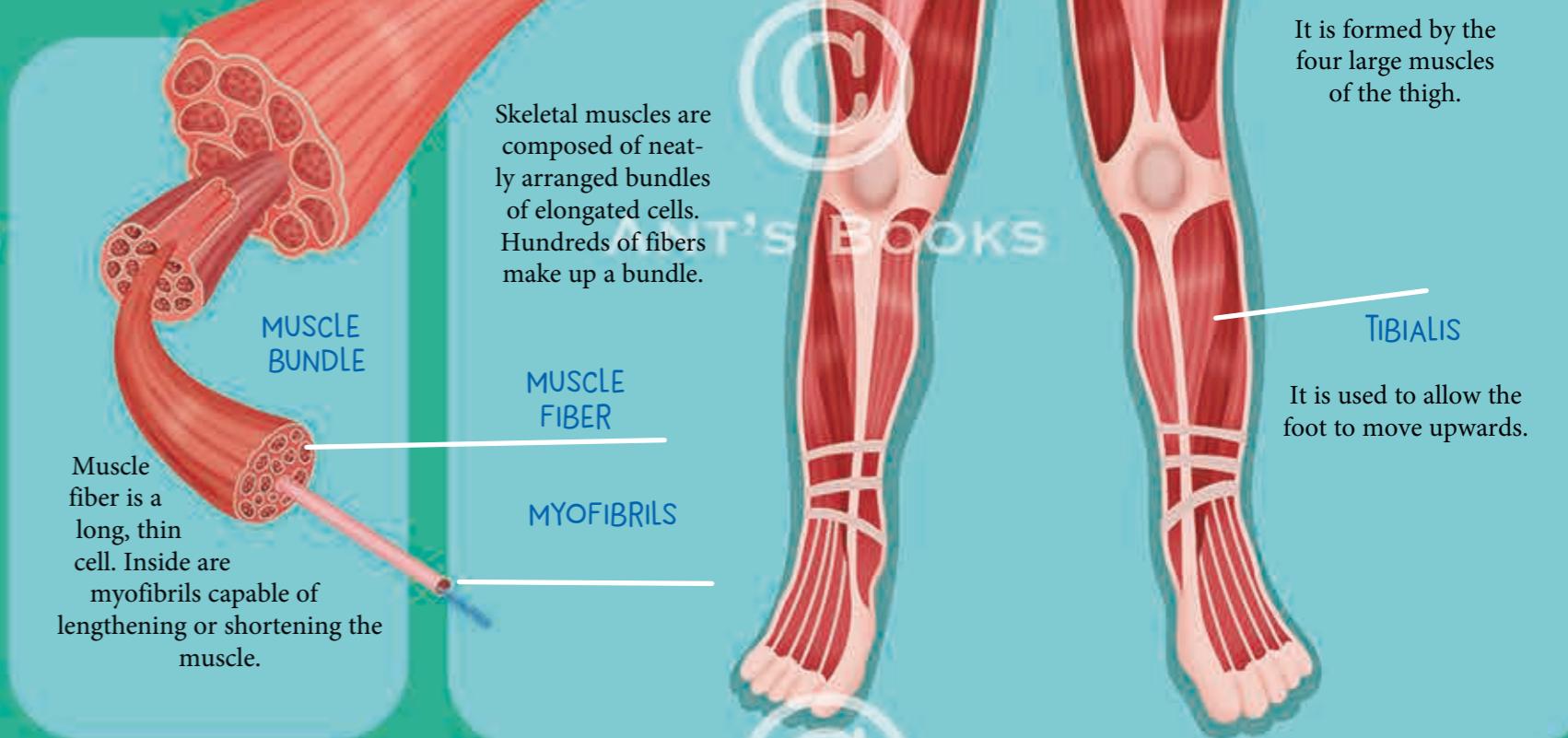
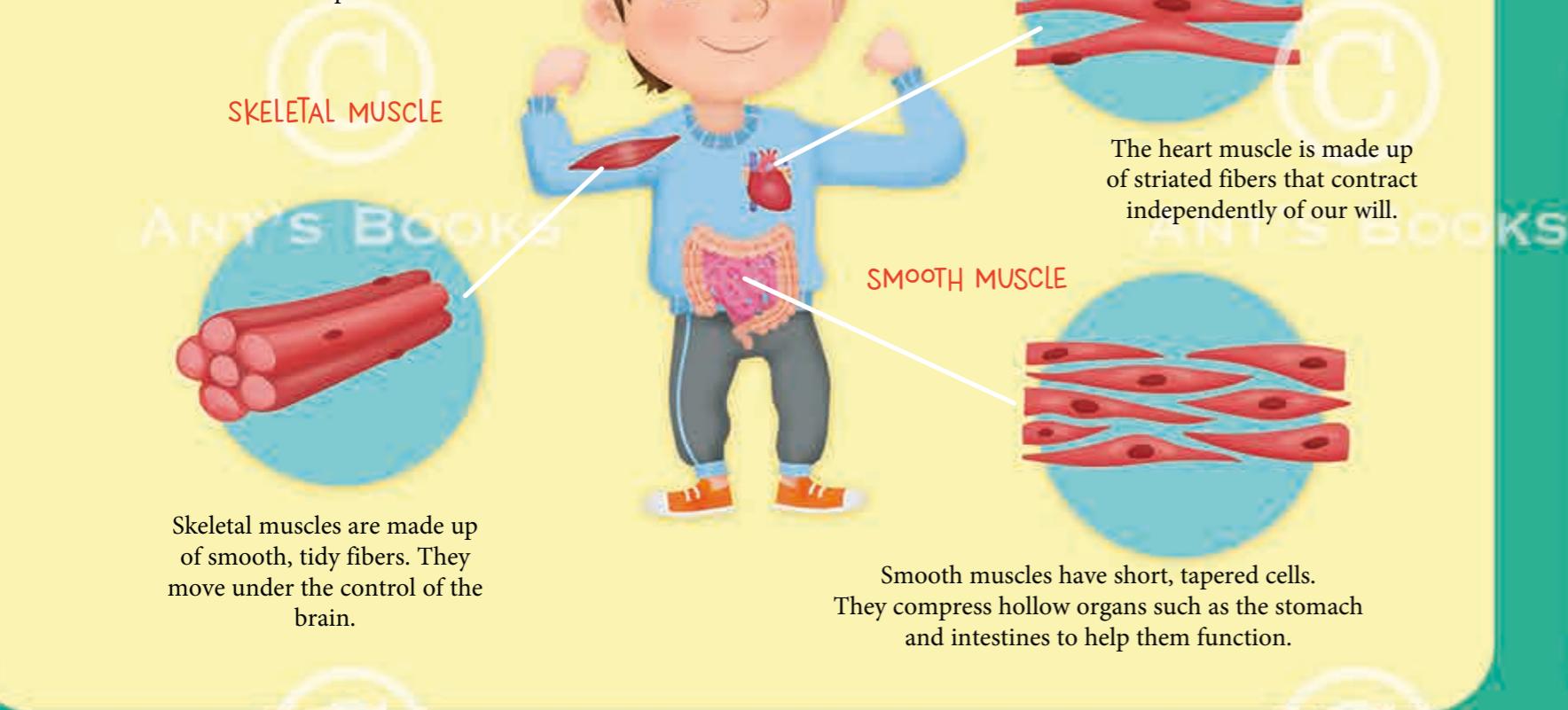
These muscles are commanded by impulses from the brain but there are others that move independently such as the heart or the smooth muscles found within the organs.



Cramps are very painful and warn you that your muscles are too tired to work any more.



Body movements are possible thanks to three different types of muscles. Each has a structure suited to the task to be performed.



Muscles are perfectly capable of pulling and pulling together two parts of the body but cannot push them apart who are unable to push them.

# THE BLOOD

ANT'S BOOKS

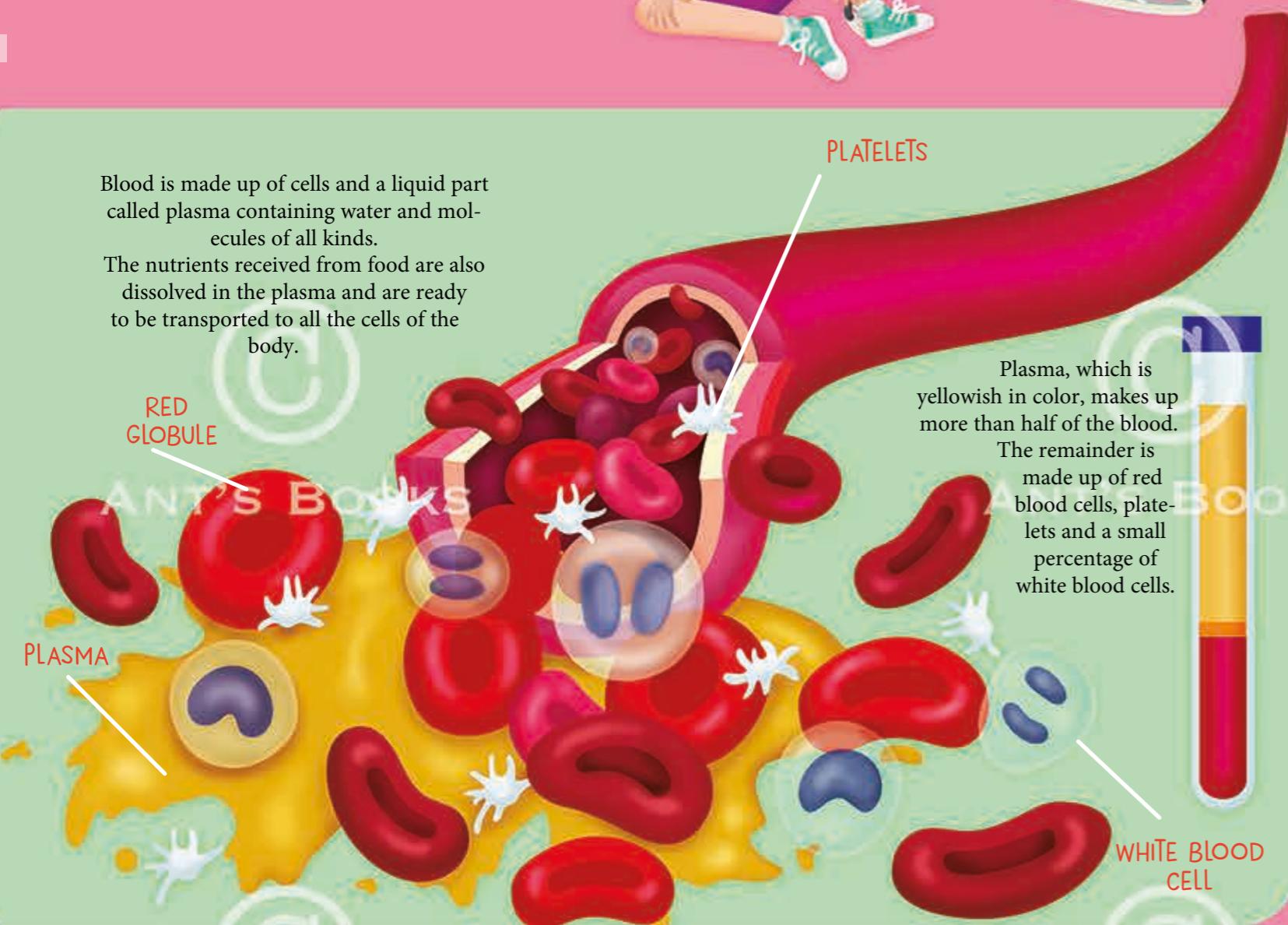
The cells must be constantly supplied with oxygen and nutrients. This important task is performed by blood which, circulating in arteries and veins, reaches every part of the body.

In addition to this, waste products are expelled through the blood and infections produced by germs are kept under control.



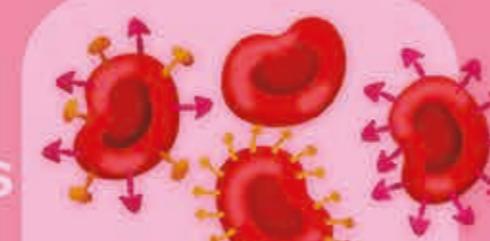
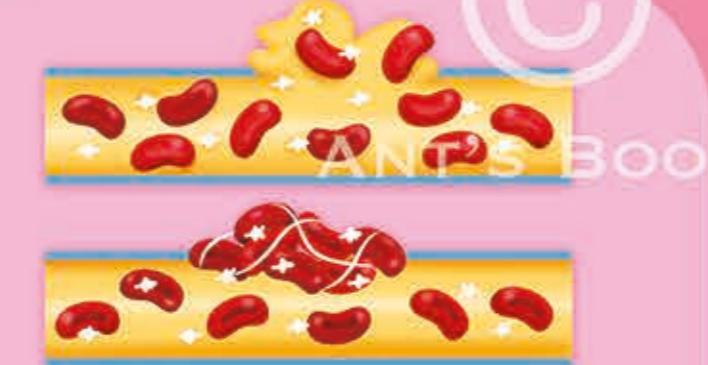
On average, an adult has about 5 liters of blood in circulation, equal to eight percent of body weight.

10



## WOUND HEALING

The blood that comes out of the wounds carries with it platelets that stop bleeding by producing tiny filaments. Together with the platelets also come the red blood cells that form the crust under which new tissue is created. White blood cells also make their contribution by chasing and destroying any bacteria present on the wound.



Red blood cells contain small molecules called antigens that indicate which group the blood belongs to.

The groups are 4 and are called: A, B, AB or O.



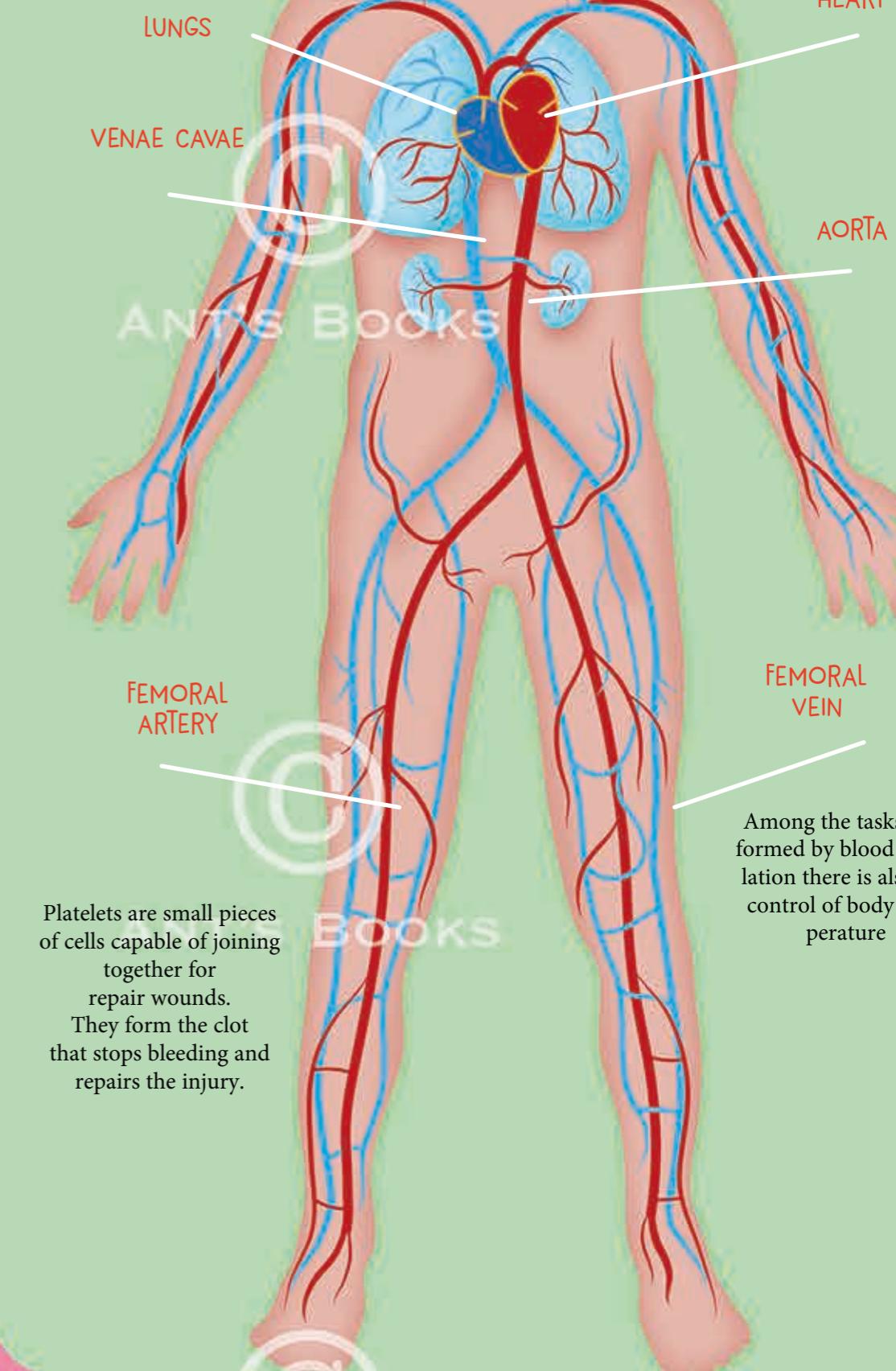
By adding up the length of the blood vessels, one would obtain a thread capable of circling the Earth more than twice.



As it travels through arteries and veins, the blood changes color.

At the departure from the heart it is light red because it is rich in oxygen. On the way back it becomes darker after exchanging oxygen with the cells.

Unlike other cells, red blood cells do not have a nucleus. They contain many molecules of a substance called hemoglobin capable of carrying oxygen.



White blood cells are the guardians of the blood. Some of them specialize in identifying bacteria and other germs, others are tasked with destroying these intruders.

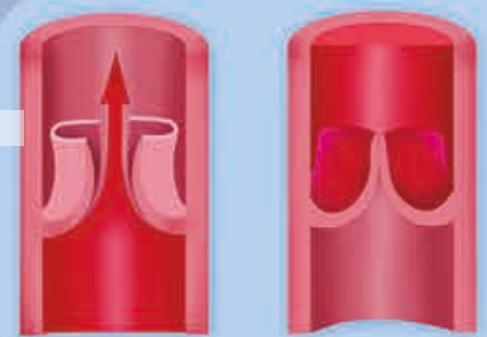
# THE HEART



The heart is a muscle the size of a closed fist placed in the center of the chest. It works as a powerful and tireless pump.

Over the course of its entire life it never stops beating, sending millions of liters of blood into circulation. The frequency of the beats depends on the needs of the body. During an effort the cells need more energy and the muscle accelerates the pace of its work.

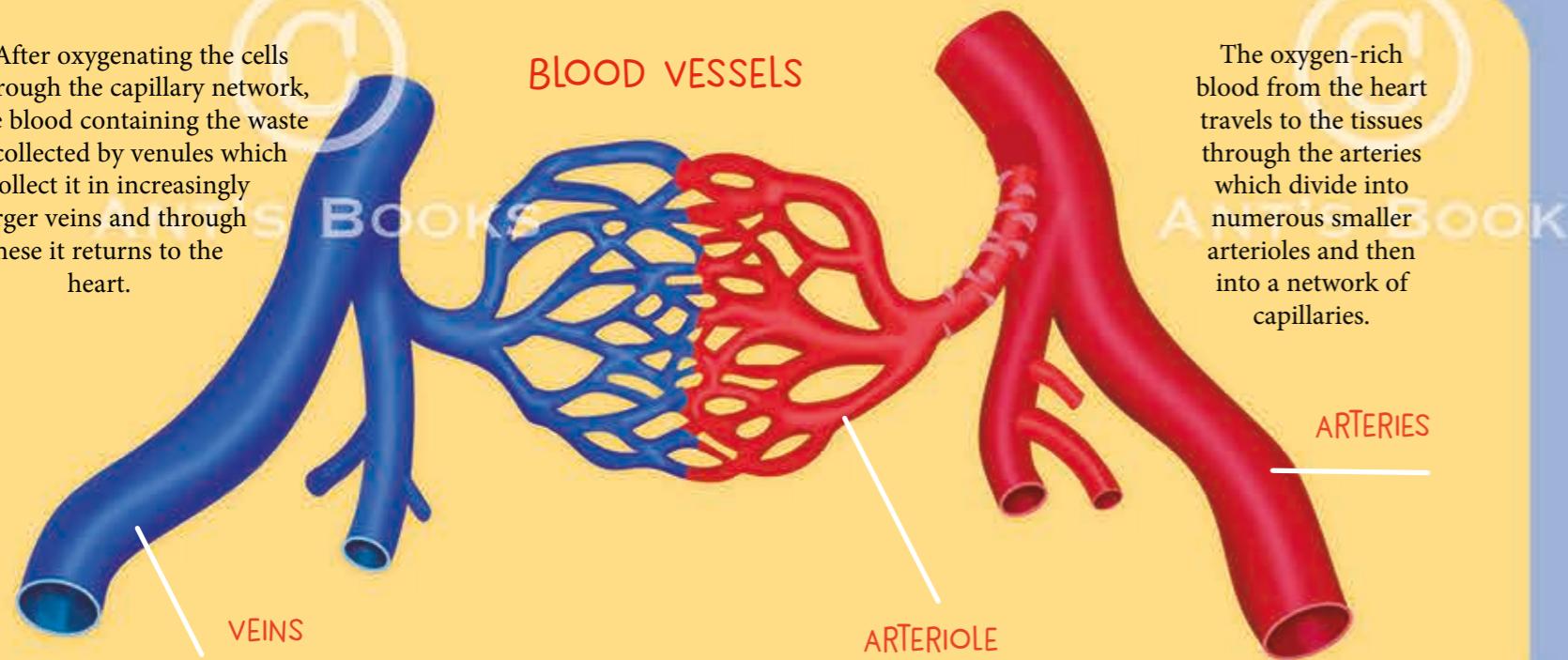
In a year, your heart can beat over 30 million times.



## VALVES

Heart valves are openings through which blood passes to different parts of the heart.

When they are open the blood can pass through them, when they close they prevent it from coming back.



## STRUCTURE OF THE ARTERIES

In the arteries, oxygen-rich blood flows from the heart. Their walls are thick and strong to withstand the pressure generated by the beats.



## STRUCTURES OF THE VEINS

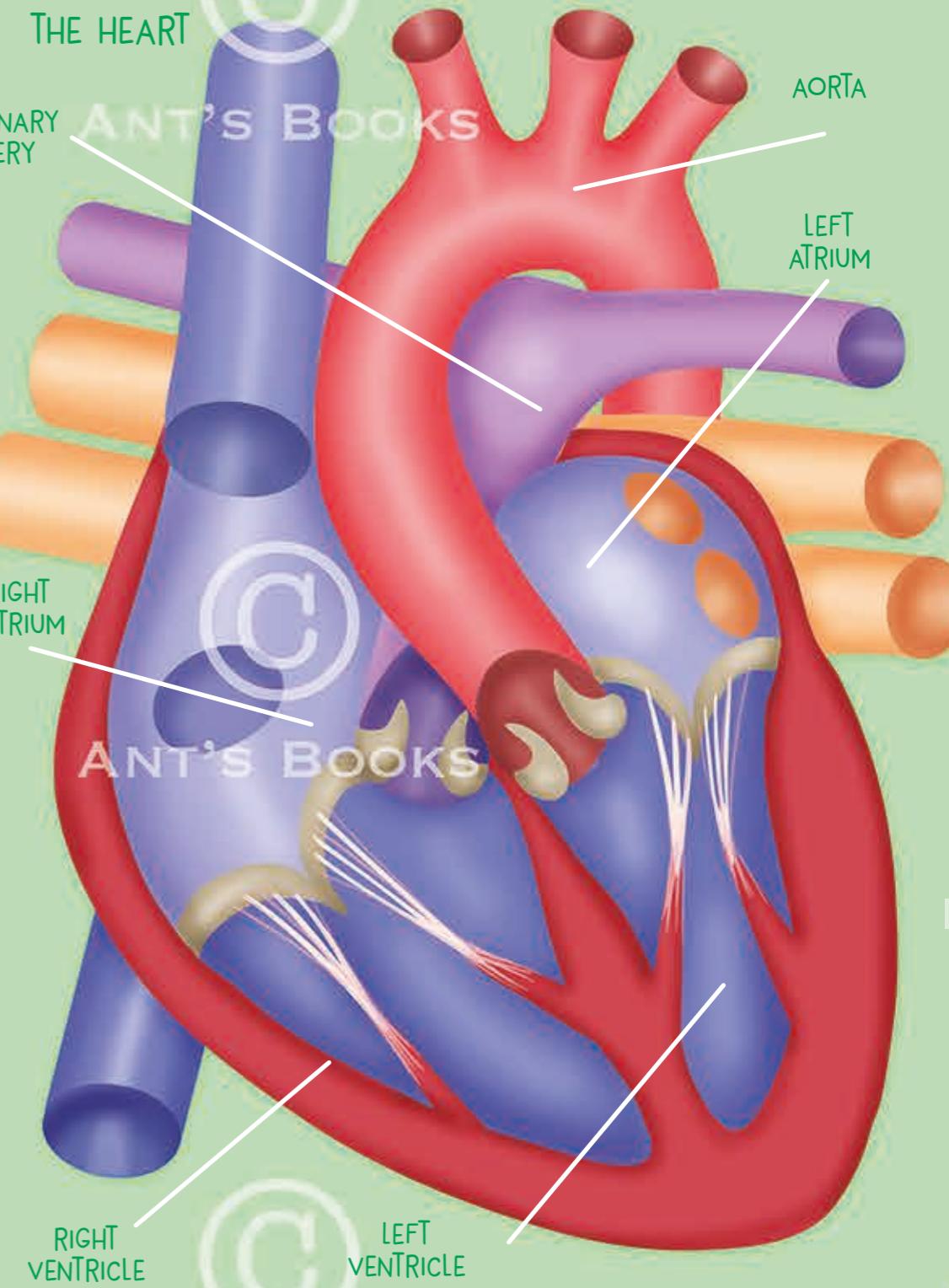
Through the veins the blood returns to the heart at a lower pressure. These vessels have thinner walls than the arteries and valves that do not let blood flow backwards.



# THE HEART

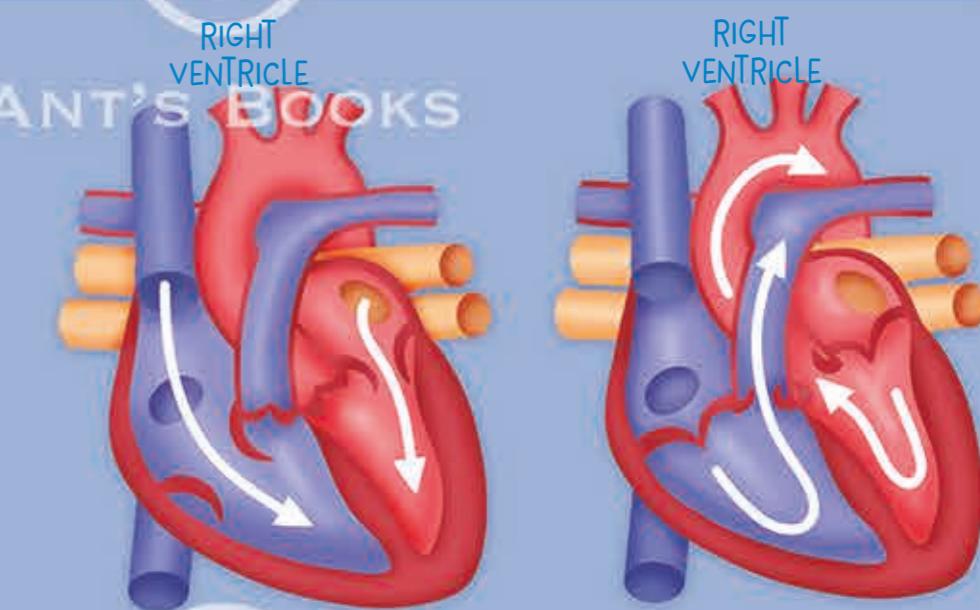


Heartbeats are more frequent in children because their bodies require more blood circulation than that of adults.



PUMP BLOOD

Every time we hear a beat, our heart has gone through three different stages. In the first, the muscle relaxes and lets the blood flow to the atria. Subsequently, the atria are compressed, filling the ventricles; in the next stage, these larger cavities contract to pump blood to the lungs and the rest of the body.



# BREATHING

ANT'S BOOKS

Our body can resist without water and food for a while time but continually needs oxygen.

The respiratory system formed by the two lungs and the ways in which the air passes to enter and exit the body ensures the continuous supply of this essential element.



The cough is caused by a reaction of the lungs that quickly send out the air to free the respiratory tract of foreign particles.



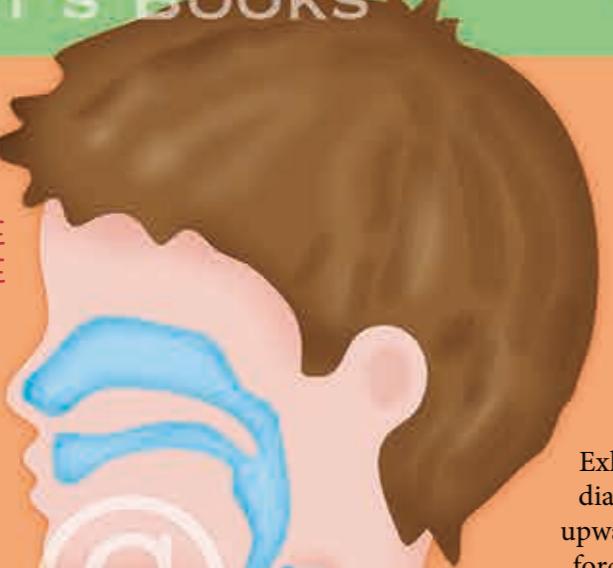
in the high mountains the air is thinner and contains less oxygen. For this reason it is more tiring to play high-level sports quote.

ANT'S BOOKS

ANT'S BOOKS

14

WHERE DOES THE AIR GO WHEN WE BREATHE?



Passing through the mouth and nose, the air reaches the trachea, from there it passes into the bronchi before reaching the lungs.

ANT'S BOOKS

BRONCHUS

Exhalation occurs when the diaphragm relaxes and rises upwards. The rib cage narrows forcing the lungs to push the air out.



ANT'S BOOKS

EXHALATION

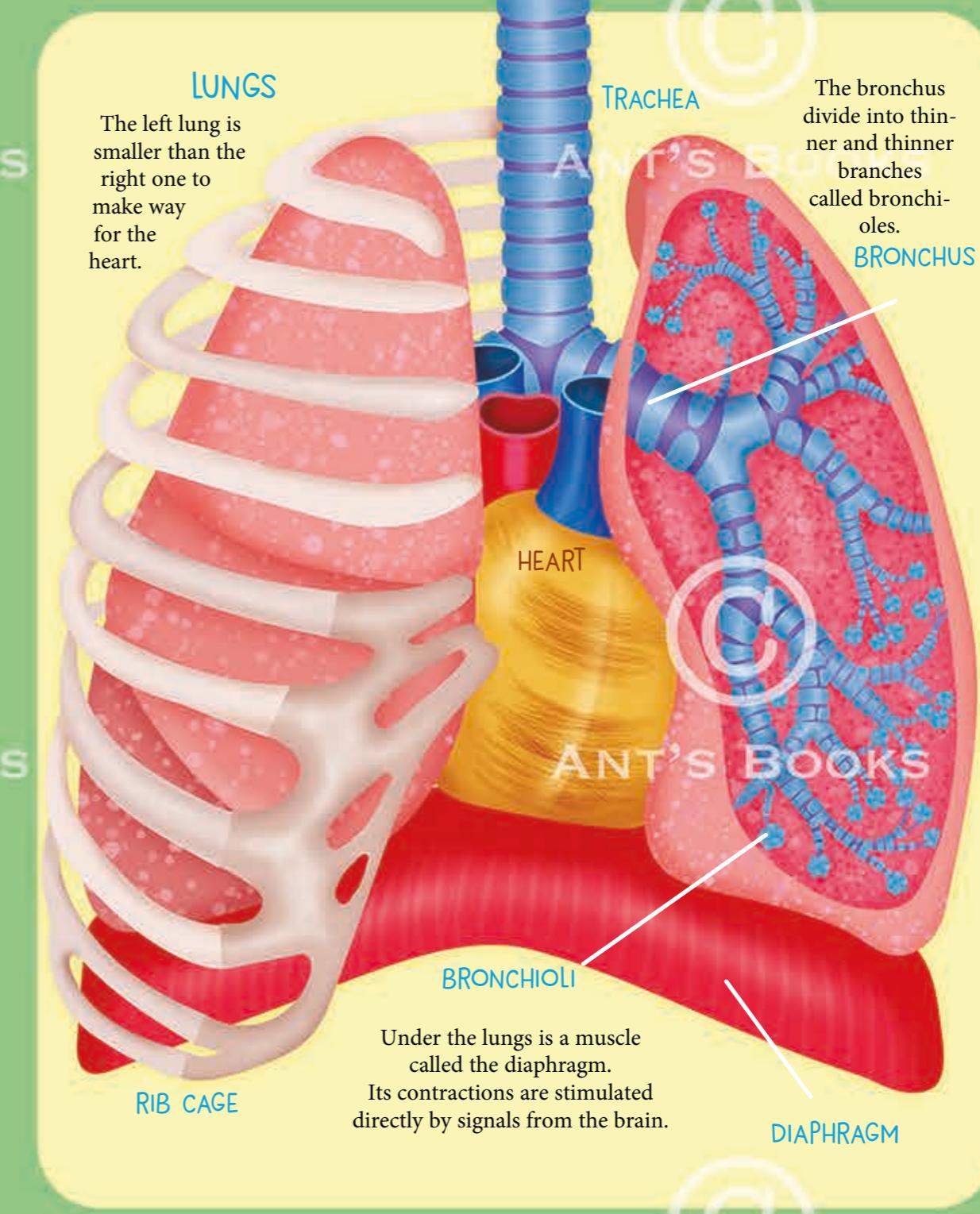
LUNGS

During rest we breathe 12 to 15 times in one minute. If we exercise, our breathing rate increases to double.



LUNGS

The left lung is smaller than the right one to make way for the heart.

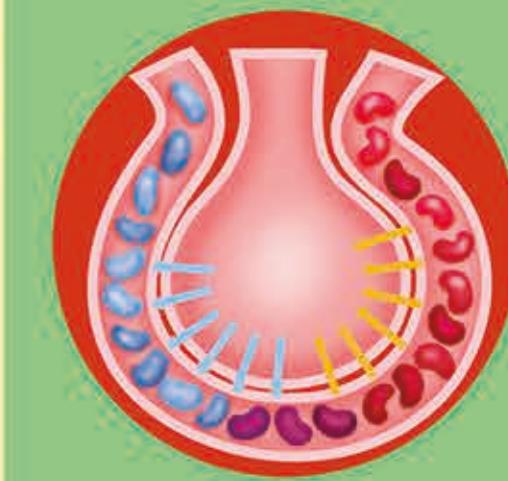


ANT'S BOOKS

The bronchus divide into thinner and thinner branches called bronchioles.

BRONCHUS

The bronchioles end in tiny spheres called alveoli. There are about 600 million of these filled sacs in the lungs of air.



The walls of the alveoli are very thin, oxygen passes through them to enter the capillaries and pass into the blood. Carbon dioxide goes the opposite way to be expelled.



THE VOICE



CLOSED VOCAL CORDS



OPEN VOCAL CORDS

The sound of our voices occurs in the larynx, a small organ that connects the throat to the trachea. Inside the larynx are the vocal cords, two tiny flaps of elastic tissue that vibrate with the passage of air.

During breathing, the vocal cords remain open and distant from each other. When we want to talk, we bring them closer by making them vibrate as the air passes by. The sounds produced become words thanks to the work of the tongue and cheeks.

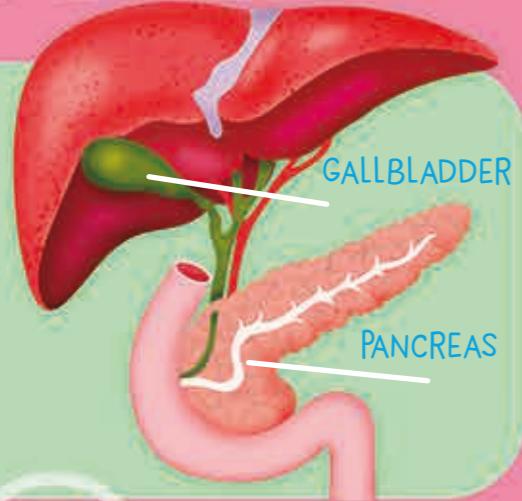
# DIGEST FOOD

## ANT'S BOOKS

Food provides the energy necessary for the functioning of our body. Food must first be digested in order to release the nutrients destined for the cells. The entire journey of food through the body takes an average of 18 hours and this complicated process is called digestion.



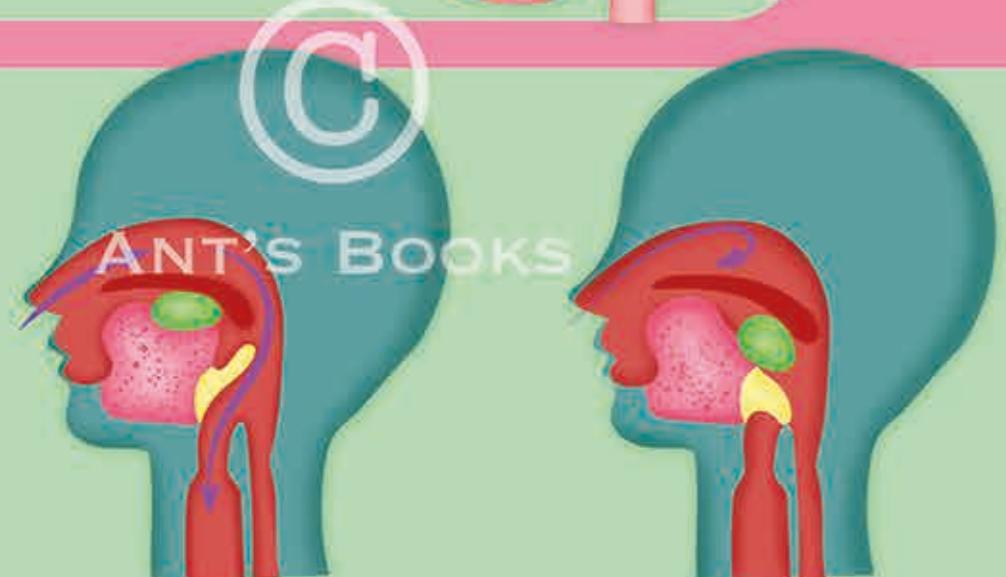
The digestive system is over 9 meters long, about 6 times your height.



### THE LIVER

16 The liver is a very complex chemical laboratory. One of its most important tasks is to transform and store sugars, the main source of energy for our body.

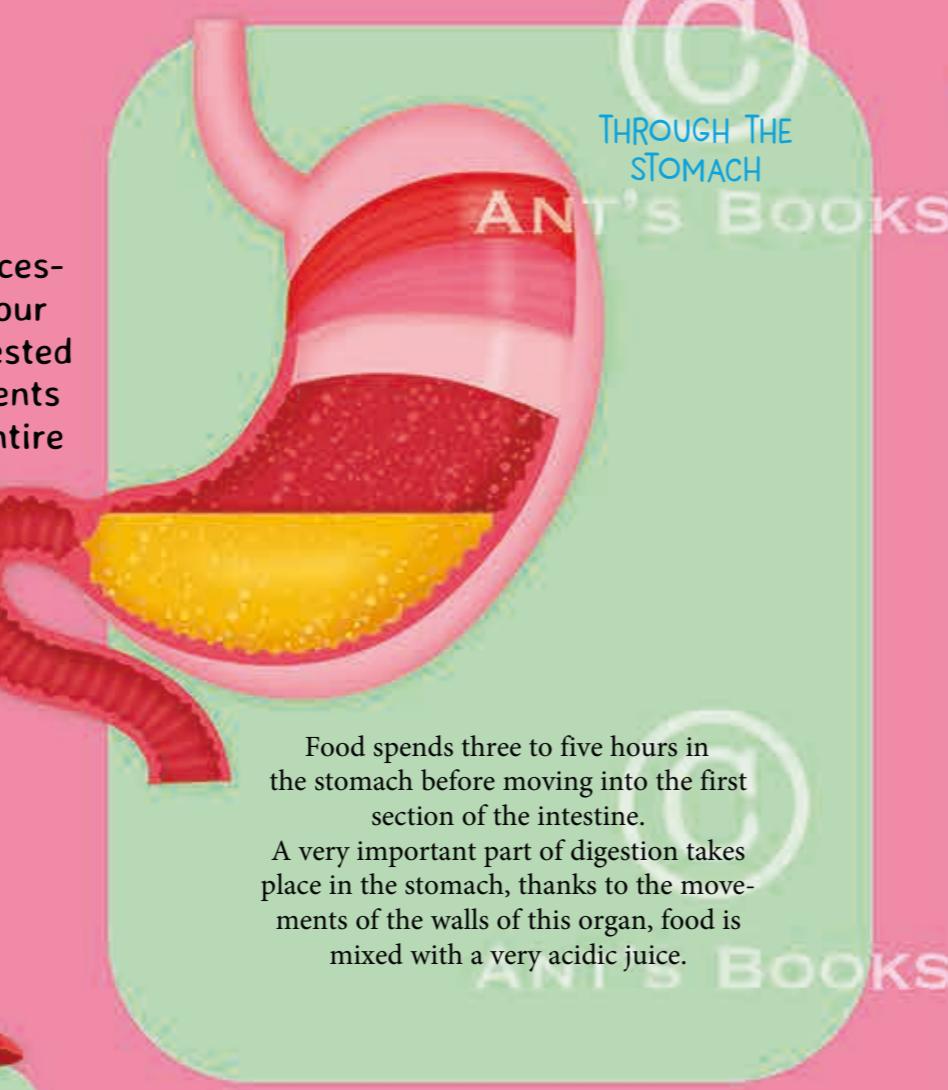
The first stage of digestion takes place in the mouth. The work of the teeth and tongue transform food by grinding it and mixing it with saliva. The saliva itself has the task of facilitating the descent of the morsels towards the stomach and starting the digestion of sugars.



The tongue has the job of mixing food with saliva before pushing it to the back of the mouth.

The pressure of chewed food against the walls of the throat automatically starts swallowing.

The larynx is closed to prevent suffocation and food flows to the stomach.



THROUGH THE STOMACH

ANT'S BOOKS

Food spends three to five hours in the stomach before moving into the first section of the intestine.

A very important part of digestion takes place in the stomach, thanks to the movements of the walls of this organ, food is mixed with a very acidic juice.

THE LONG JOURNEY OF FOOD



Food shredded from the teeth travels from the mouth to the stomach through a long tube called the esophagus.

ESOPHAGUS

LIVER

STOMACH



If your stomach makes itself felt with small rumblings it can be hunger or his attempt to get rid of food that he cannot digest and that he wants to return to his mouth.

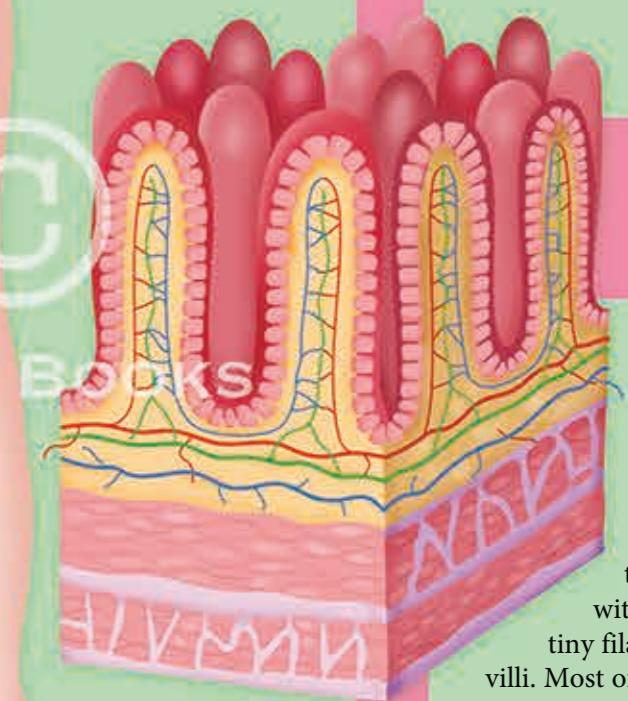


17 The intestine is the largest tract of the digestive system. This long "tube" is divided into several parts that have different tasks.

The work of the liver is able to filter the blood by releasing it from many harmful chemicals. This organ also produces the bile necessary to digest fats

To the left of the liver is the pancreas, in this organ a liquid rich in substances called enzymes essential for the digestion of food.

The long path of food is completed in the large intestine. Here everything that has not been digested prepares to be eliminated from the body.



INTESTINAL VILLUS

The inner wall of the small intestine is covered with millions of tiny filaments called villi. Most of the nutrients in transit are absorbed through these small protrusions full of blood vessels.

# TEETH AND MOUTH

## ANT'S BOOKS

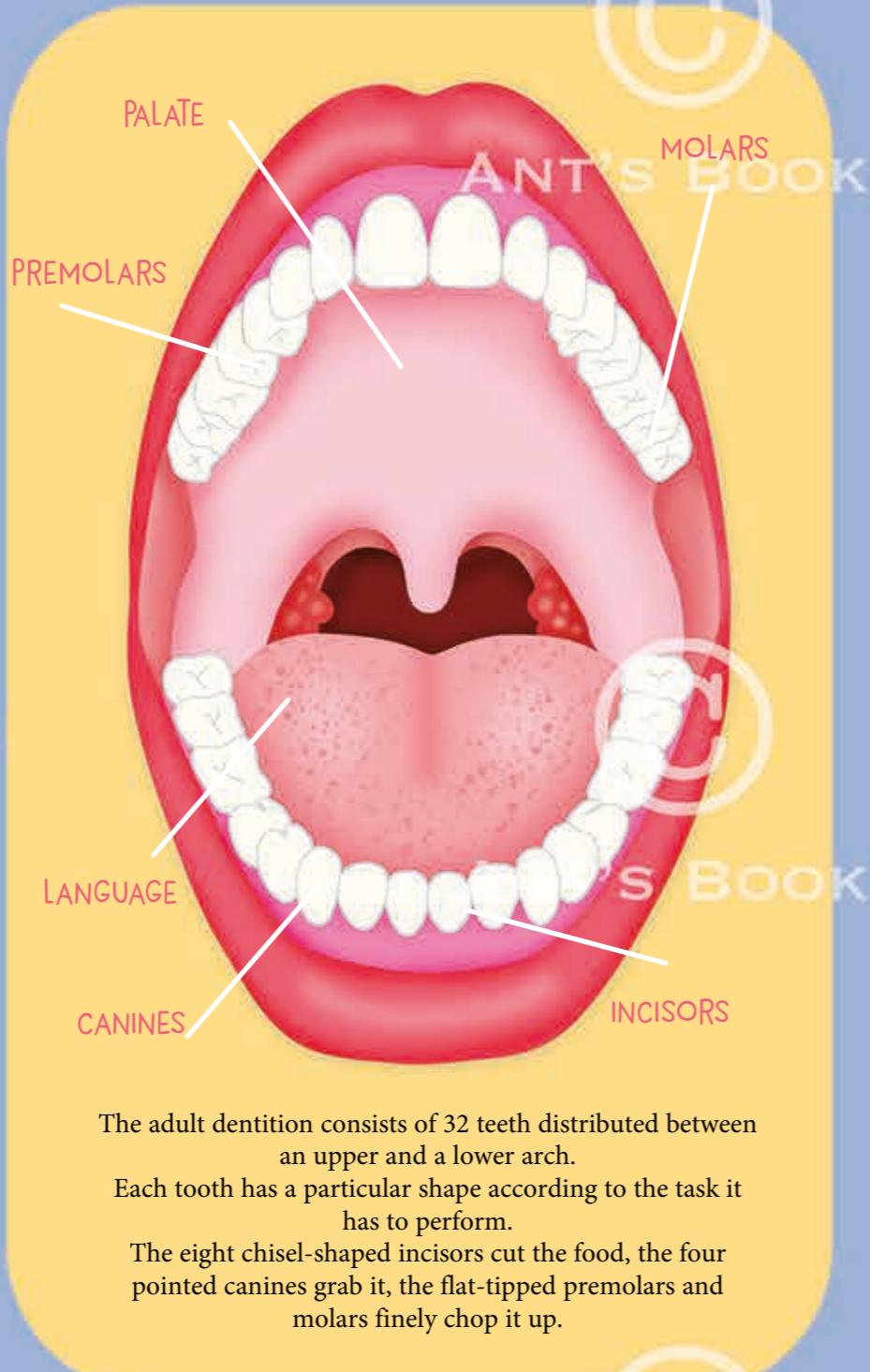
The mouth is where food enters the digestive system. Here are the teeth that chew everything we eat, reducing it into bites that are easy to swallow. The saliva serves to moisten the chewed food as the movements of the tongue push it towards the throat.



The baby's mouth appears toothless, the first ones sticking out of its gums around 6 months.



At birth, the milk teeth are all already present but they are fine hidden inside the gums. These first temporary teeth are 20 and remain in the mouth until about 6 years when they begin to be replaced by permanent ones.



The adult dentition consists of 32 teeth distributed between an upper and a lower arch.

Each tooth has a particular shape according to the task it has to perform.

The eight chisel-shaped incisors cut the food, the four pointed canines grab it, the flat-tipped premolars and molars finely chop it up.



Toothache is very annoying and can have many different causes.

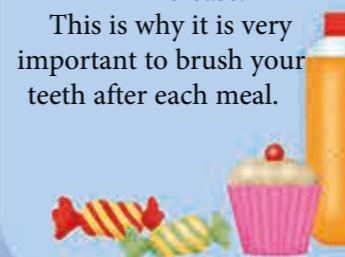


Sometimes the teeth don't come out in just the right place and can create minor problems. To correct these imperfections, the dentist applies special filaments that help bring them back to the correct position.



Sugars are one of the main causes of tooth decay because they nourish the bacteria in the mouth by making them increase.

This is why it is very important to brush your teeth after each meal.



Many bacteria normally live in the mouth. If their number increases too much, it can happen that they manage to create holes in the enamel. After piercing the protective layer they easily reach the dentin and infect the entire tooth.



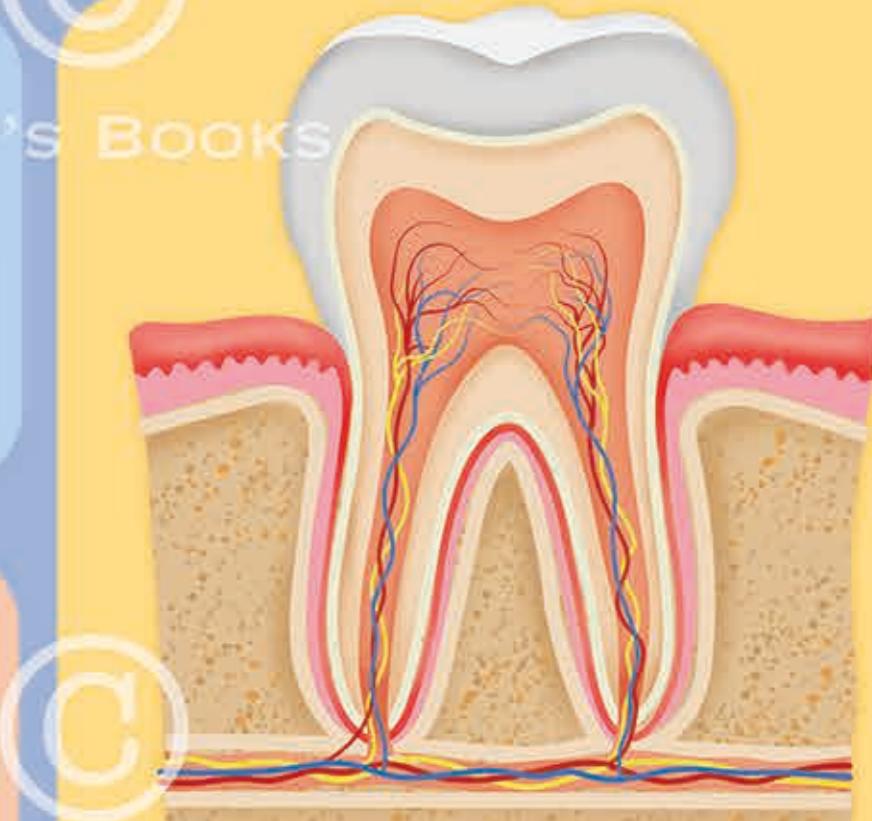
Each tooth consists of a visible part called the crown and a root that remains hidden inside the bone. The crown is covered with enamel, a hard and resistant substance that protects the underlying layer, the dentin. Inside is the lively and sensitive pulp rich in nerves and blood vessels.

## MOUTH HYGIENE

If the teeth are not brushed well regularly, over time they become covered with patches of plaque. This substance formed by bacteria and food remains attacks the teeth and causes tooth decay, a very painful disease.



Taking care of your teeth is essential to keep a beautiful smile for a long time and to stay healthy. This is why it is very important to have them checked by the dentist at least once a year.



# EATING



The best diet we can follow is the one that involves many different foods, preferably fresh, eaten in the right quantities.

To maintain the right doses of the various foods, a pyramid chart has been designed that provides the correct proportions between the different foods.



French fries are appetizing but contain a lot of fat and are as unhealthy as over-roasted meats.

20



Highly sugary sweets should be eaten infrequently and are at the top of the food pyramid. Cereals, on the other hand, are the basis and are the main source of energy.

## FRUITS AND VEGETABLES

In addition to being rich in vitamins, fruits and vegetables are sources of fiber that promote digestion. Milk is great for providing calcium and protein, other dairy products such as butter contain a lot more fat and should be eaten in small amounts.



20

21

## CHECK YOUR WEIGHT

Our body needs a certain number of calories on a daily basis which varies according to age and the type of life we lead.

If we eat too much or incorrectly we tend to get fat.

20

21

## SNACKS



Snacks, biscuits, sweet and fizzy drinks are much higher in calories than fruit and vegetables. For this they should be ingested with moderation.

20

Everyone likes desserts but it is better not to overdo the pleasures of the table.

Meats and legumes are rich in important proteins. The meats, though proteins contain fats and salts and we must limit their consumption.

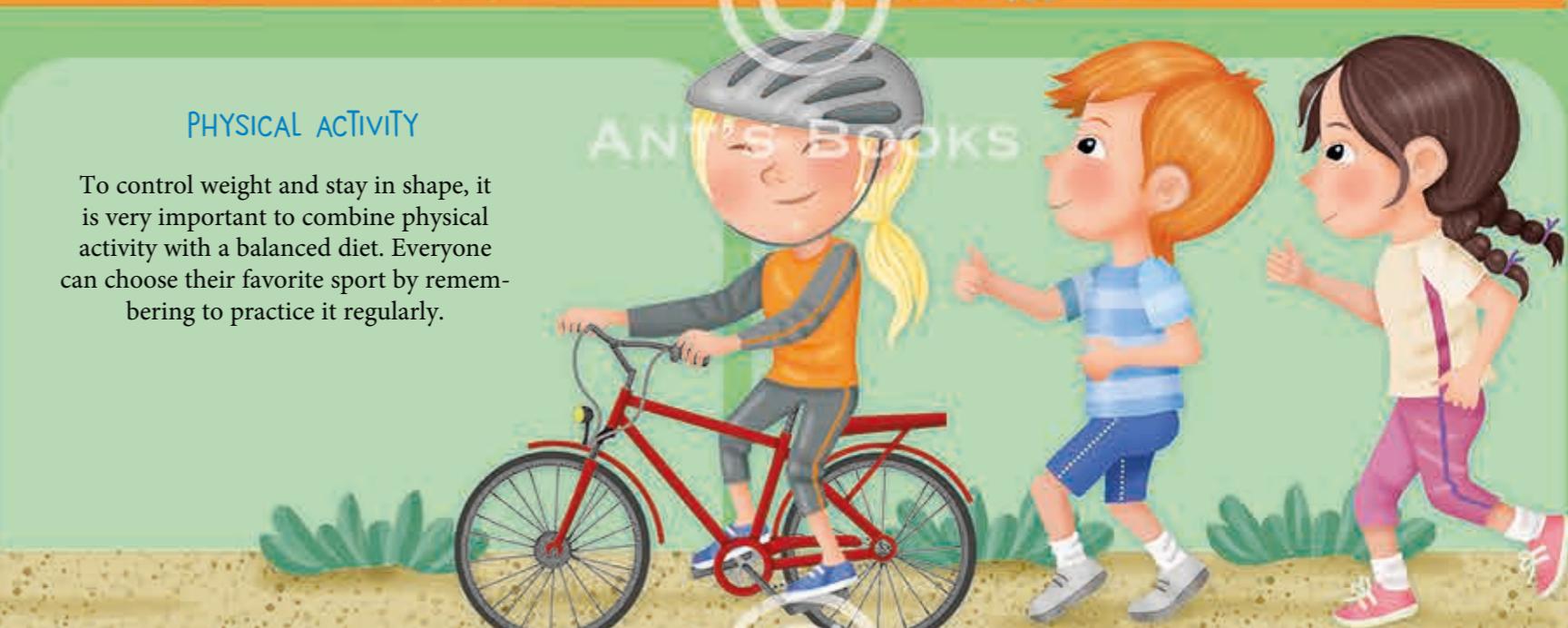
Milk, eggs, white meats provide valuable proteins.

Seasonal fruits and vegetables are sources of vitamins.



## PHYSICAL ACTIVITY

To control weight and stay in shape, it is very important to combine physical activity with a balanced diet. Everyone can choose their favorite sport by remembering to practice it regularly.



SWEETS

RED MEATS AND SALAMI

MILK EGGS MILK

FRUITS AND VEGETABLES

CEREALS

21

# THE BRAIN

The brain is a very complex organ that controls all functions of the body.

The largest and most important part of this organ is called the cortex and corresponds to the outer layer where neurons are concentrated.

In the back of the skull are the cerebellum and medulla oblongata which are the other two parts that make up the entire brain.

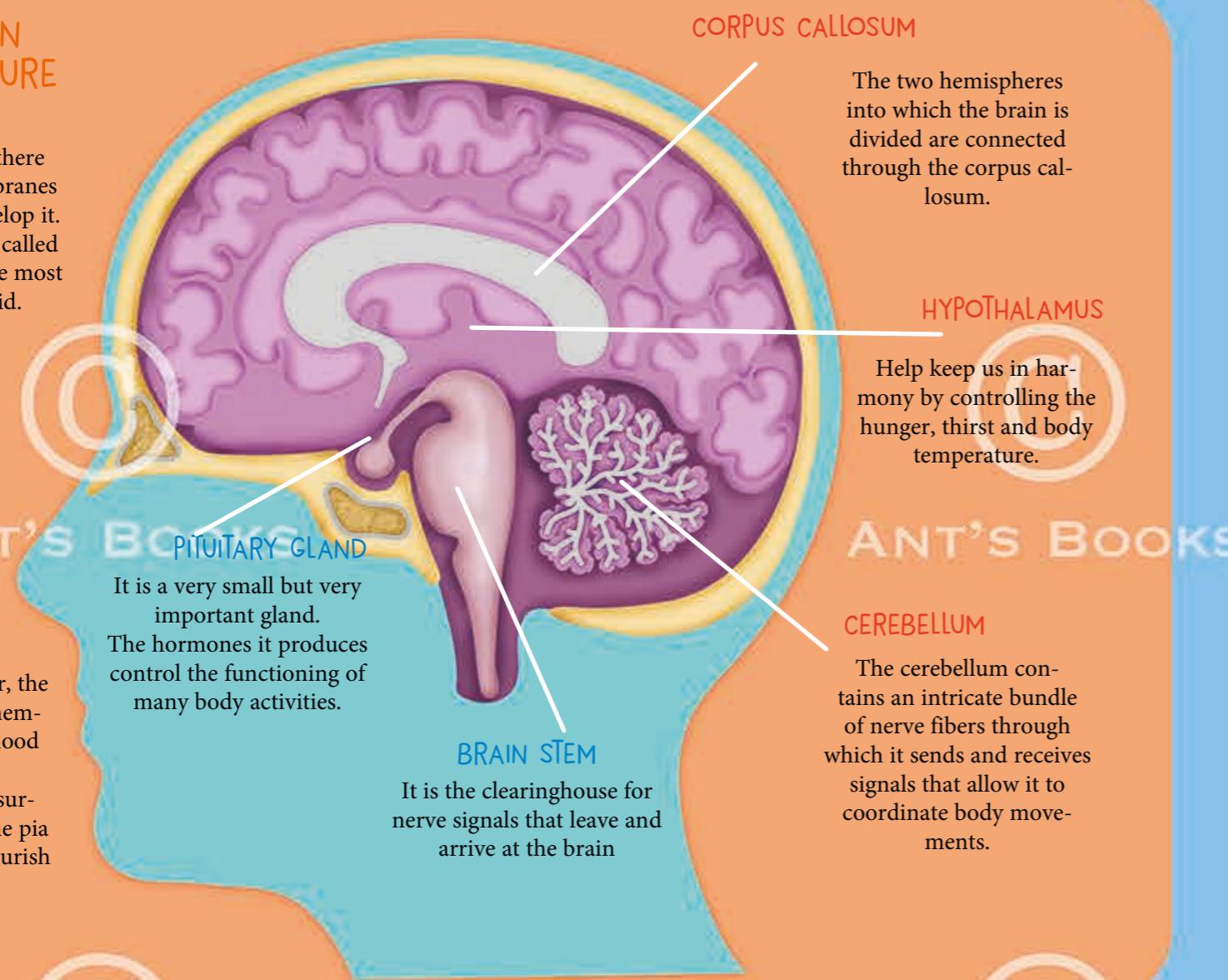


According to the most recent studies, there are about 86 billion neurons in the brain.

The brain weighs only 2% of the total body but to function it needs about a fifth of the oxygen we breathe.

## BRAIN STRUCTURE

Around the brain there are three thin membranes that completely envelop it. The outermost one, called the dura mater, is the most resistant and rigid.



Under the dura mater, the delicate arachnoid membrane protects the blood vessels.

In contact with the surface of the organ is the pia mater which helps nourish the brain.

Among the most surprising functions of the brain is that of memory.

Thanks to this ability we are able to catalog a large amount of information that allows us to control movements, to remember the rules, to write and to keep the memory of episodes distant in time.

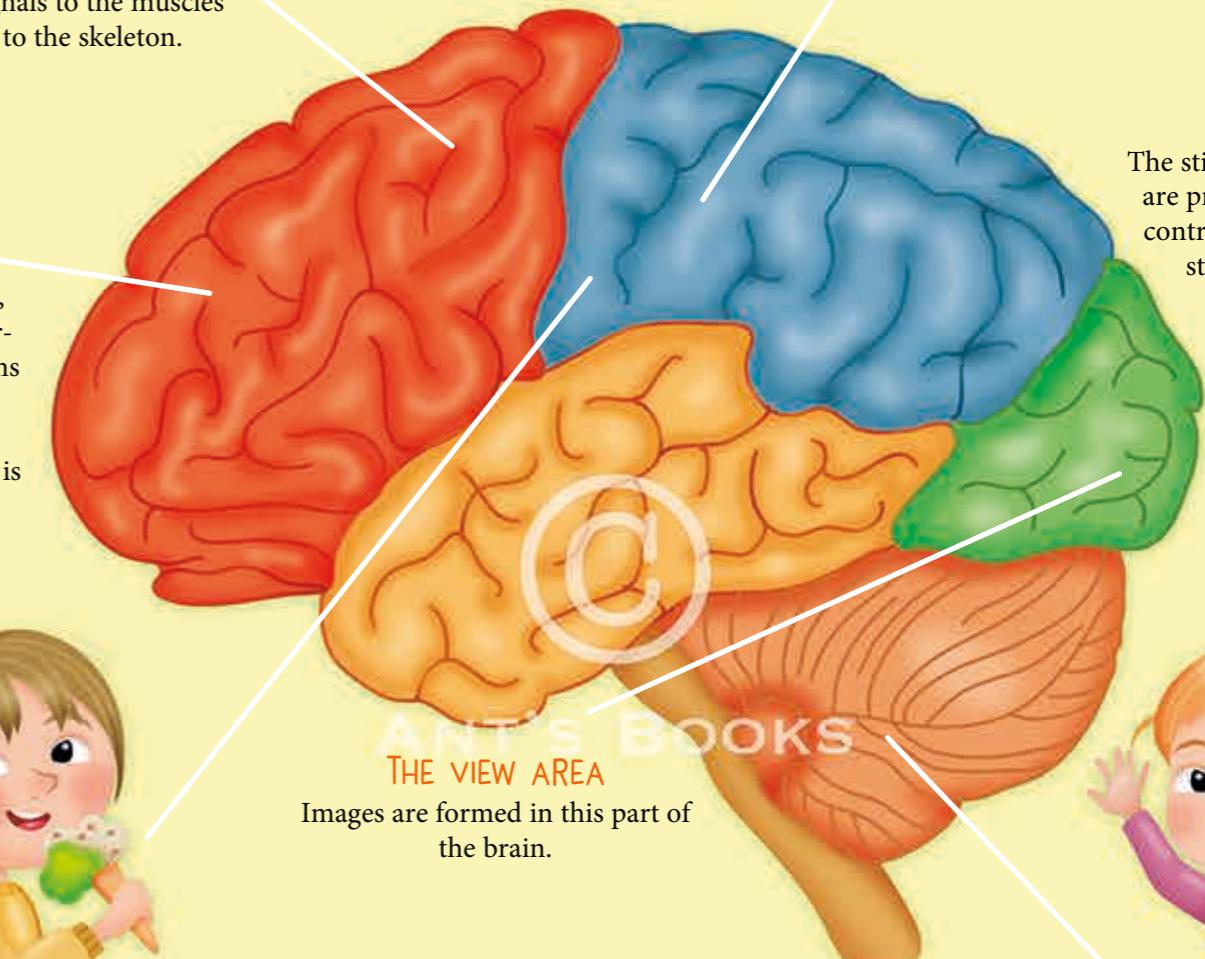


## AREAS OF THE BRAIN

It controls the movement of the body by sending signals to the muscles connected to the skeleton.

### THE LANGUAGE AREA

In the frontal area, learning and understanding of problems are checked. Just behind is the area where the language is formed.



### THE AREA OF TOUCH

Here come the signals from the receptors that are scattered all over the skin.

The stimuli of touch are processed and controlled and then stored in memory.

## LEFT HEMISPHERE



The left hemisphere is dominant for the functions of calculation and logic and mathematics and controls the right part of the body.

## RIGHT HEMISPHERE



In the right hemisphere our creativity develops as well as the coordination of the left side of the body.

# THE NERVE NETWORK

## ANT'S BOOKS

The nervous system allows the control of all the activities of the body. It is made up of billions of cells called neurons that are closely linked to each other. This network allows messages from the brain to be transmitted to the rest of the body. Messages travel through the nerves at high speed and allow us to react to what is happening inside and outside the body.

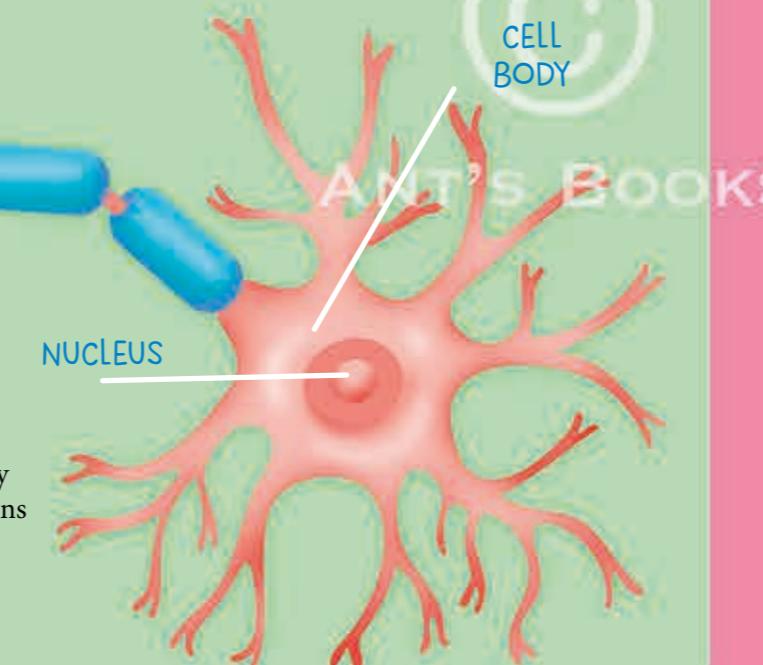
### THE SYNAPSES

Neurons connect to each other via synapses. When the electrical impulses reach one of these nodes they come transformed into chemical signals and passed on to the next neuron.



### NEURONS

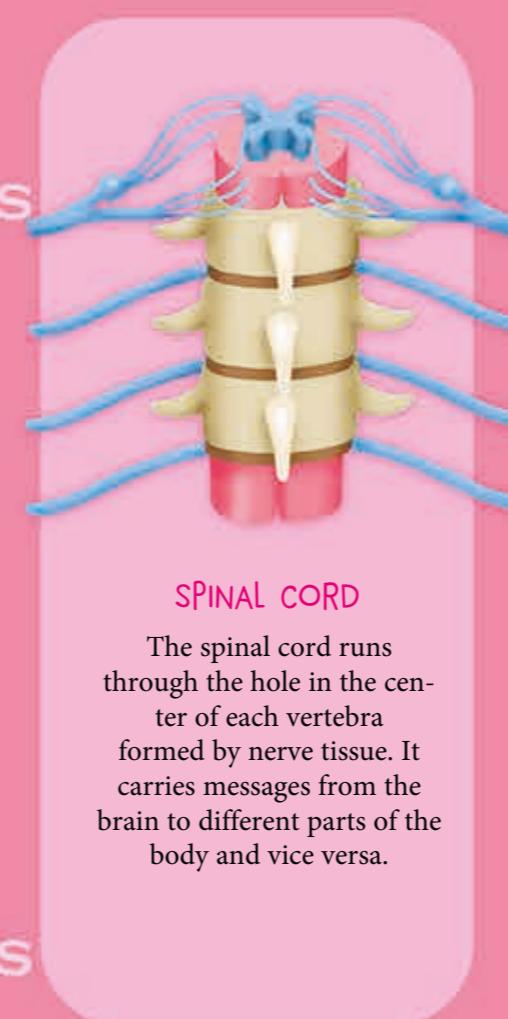
Neurons are of different types according to the number of axons and dendrites they possess



The axon is a long filament that carries impulses out of the cell. Sometimes the axon splits into two branches.

Dendrites are tiny extensions that capture signals from other neurons. Each neuron can have up to 200 dendrites but this number varies according to the type of cell.

The capabilities of the brain largely depend on the number of connections between neurons.

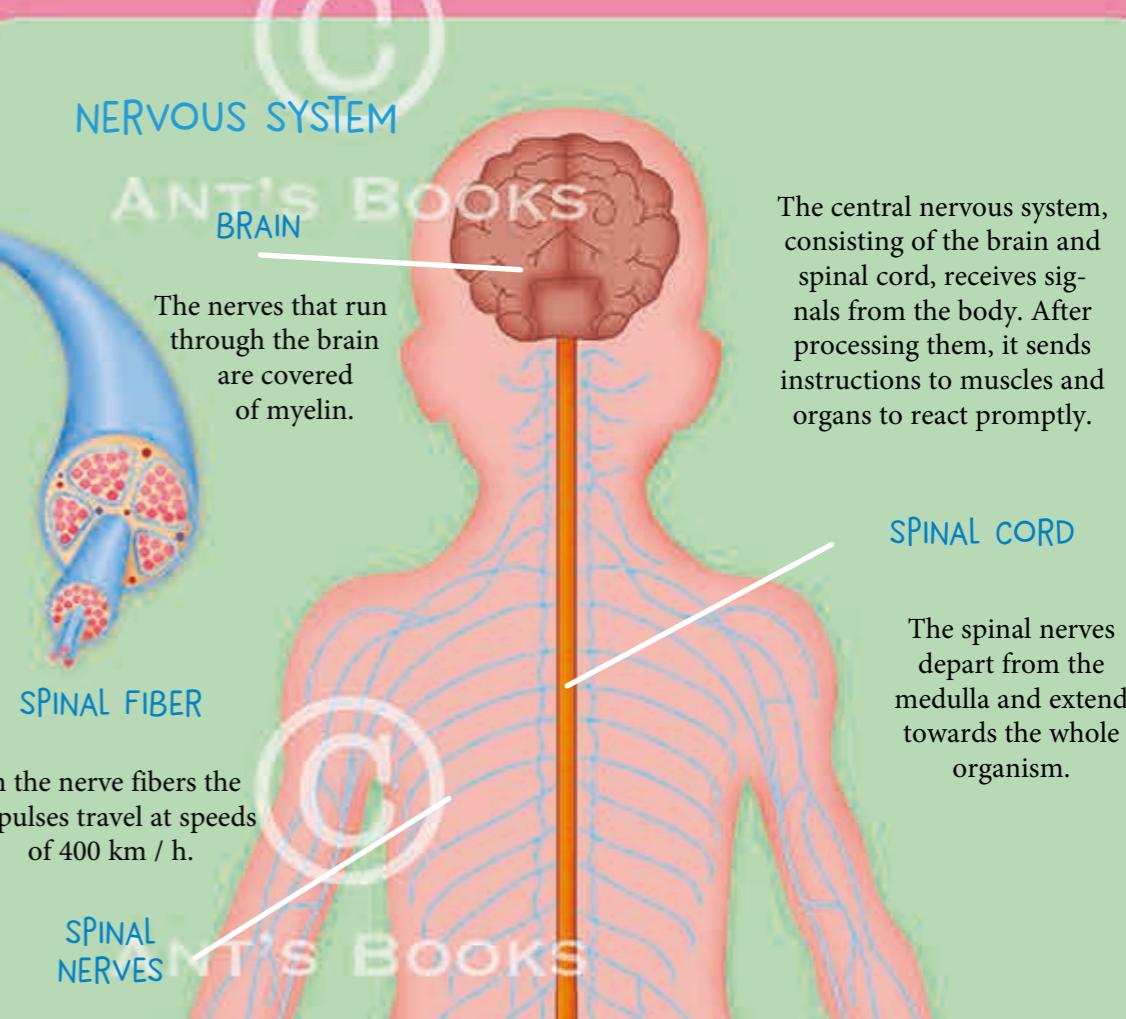


### SPINAL CORD

The spinal cord runs through the hole in the center of each vertebra formed by nerve tissue. It carries messages from the brain to different parts of the body and vice versa.

From the third month after conception, the fetus has as many nerve cells as an adult.

Subsequently, the very important connections between neurons develop.



### NERVOUS SYSTEM

#### ANT'S BOOKS

The nerves that run through the brain are covered of myelin.

### SPINAL FIBER

In the nerve fibers the impulses travel at speeds of 400 km / h.

### SPINAL NERVES

### SCIATIC NERVE

The sciatic nerve is the longest in the body. It is connected to the leg muscles with branches that reach up to the foot.

The myelin that covers the axons of neurons serves for their protection and to speed up transmission

The central nervous system, consisting of the brain and spinal cord, receives signals from the body. After processing them, it sends instructions to muscles and organs to react promptly.

### SPINAL CORD

The spinal nerves depart from the medulla and extend towards the whole organism.

Each nerve is made up of bundles of thousands of nerve fibers. I'm the axons of the neurons that connect the different parts of the body even more than 90 centimeters apart.

Brain cells constantly need oxygen. They can die if they are not restocked for more than 5 minutes.

# WASTE TO BE ELIMINATED

## ANT'S BOOKS

The cells of the body are continuously active and, carrying out their activities, produce a lot of waste which must be removed from the body. Many of these waste substances end up in the blood from which must then be removed in order not to damage the body.



It is the brain that hears the messages of the bladder and understands when it is time to pee.

It may seem easy but for the first time it is not. Young children cannot control the stimulus and get rid of urine as soon as they feel the need.

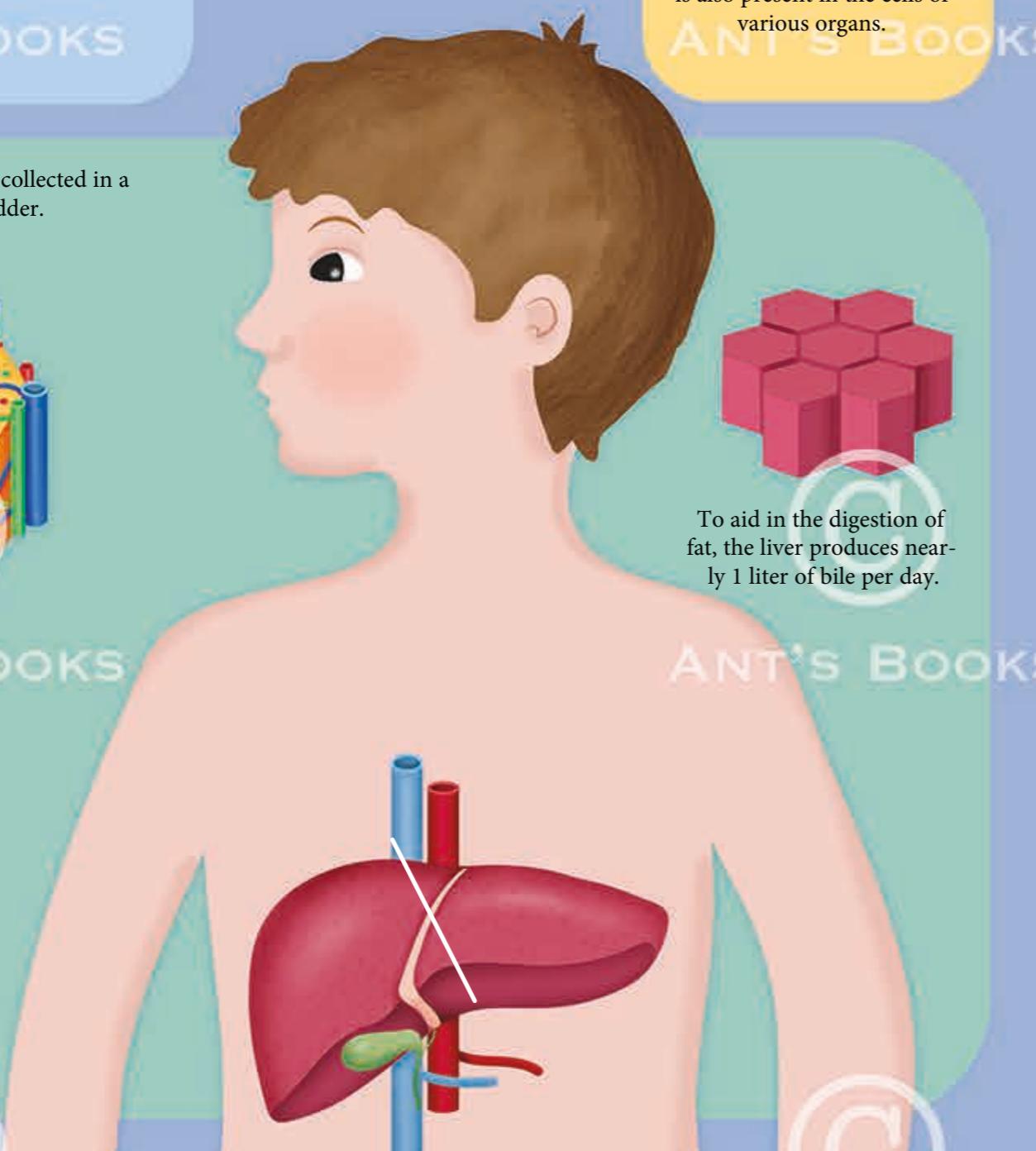
Over time they will learn how to do it on the potty.

The bile produced by the liver is collected in a pouch called the gallbladder.



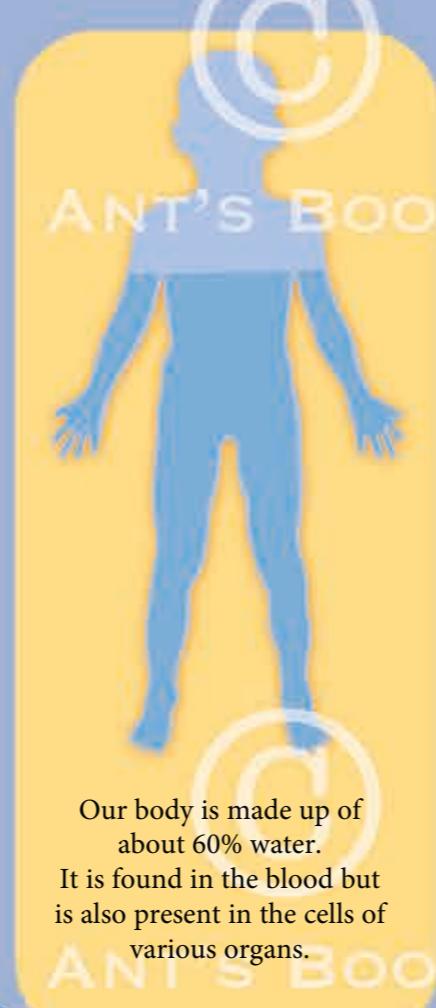
## HEPATIC LOBULE BOOKS

The liver is divided into two parts called lobes. Inside them, yes they find the hepatic lobules each of which is a small laboratory chemist. When the blood passes through these units it comes filtered to eliminate toxic substances. The lobules also play the task of storing nutrients and vitamins.



To aid in the digestion of fat, the liver produces nearly 1 liter of bile per day.

## ANT'S BOOKS



## ANT'S BOOKS

The task of filtering the blood falls to the liver and kidneys. The liver is the largest internal organ in the body and receives blood from the heart and intestines. Its cells function like a chemical laboratory by accumulating nutrients, eliminating waste and producing bile.

Our body is made up of about 60% water.

It is found in the blood but is also present in the cells of various organs.

## ANT'S BOOKS



## SOLID WASTE

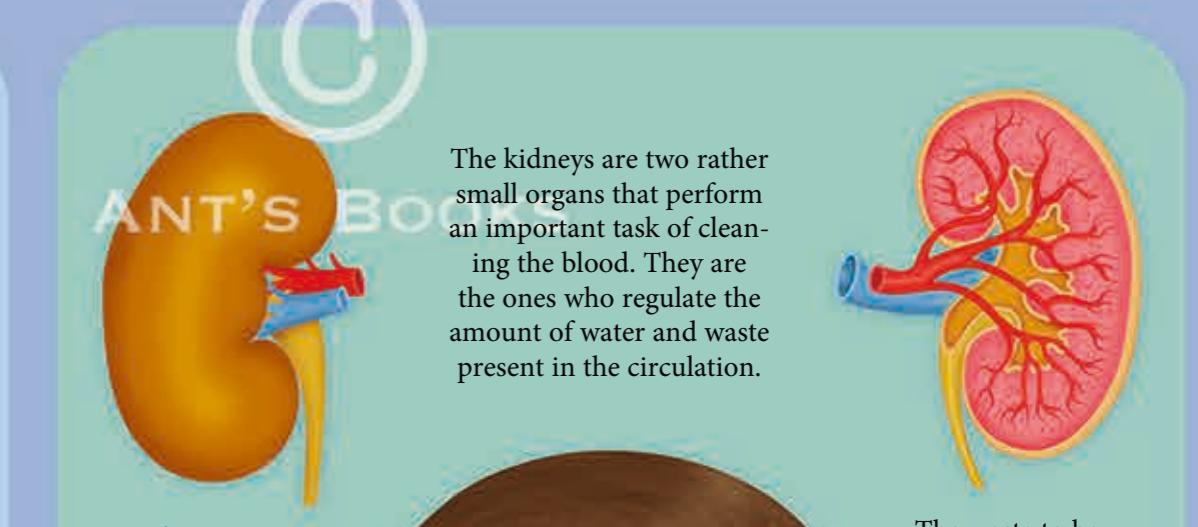
After making a long journey through the body, the food moves towards the last section of the intestine called the "large".

Here the waste is still digested to exploit all the useful substances. What remains is then transformed into faeces which are collected in the final duct before being expelled.

The urge to drink arises from a stimulus coming from the brain. Here is the hypothalamus that checks whether the water present in the blood is sufficient or whether it needs to be supplemented with a good drink.



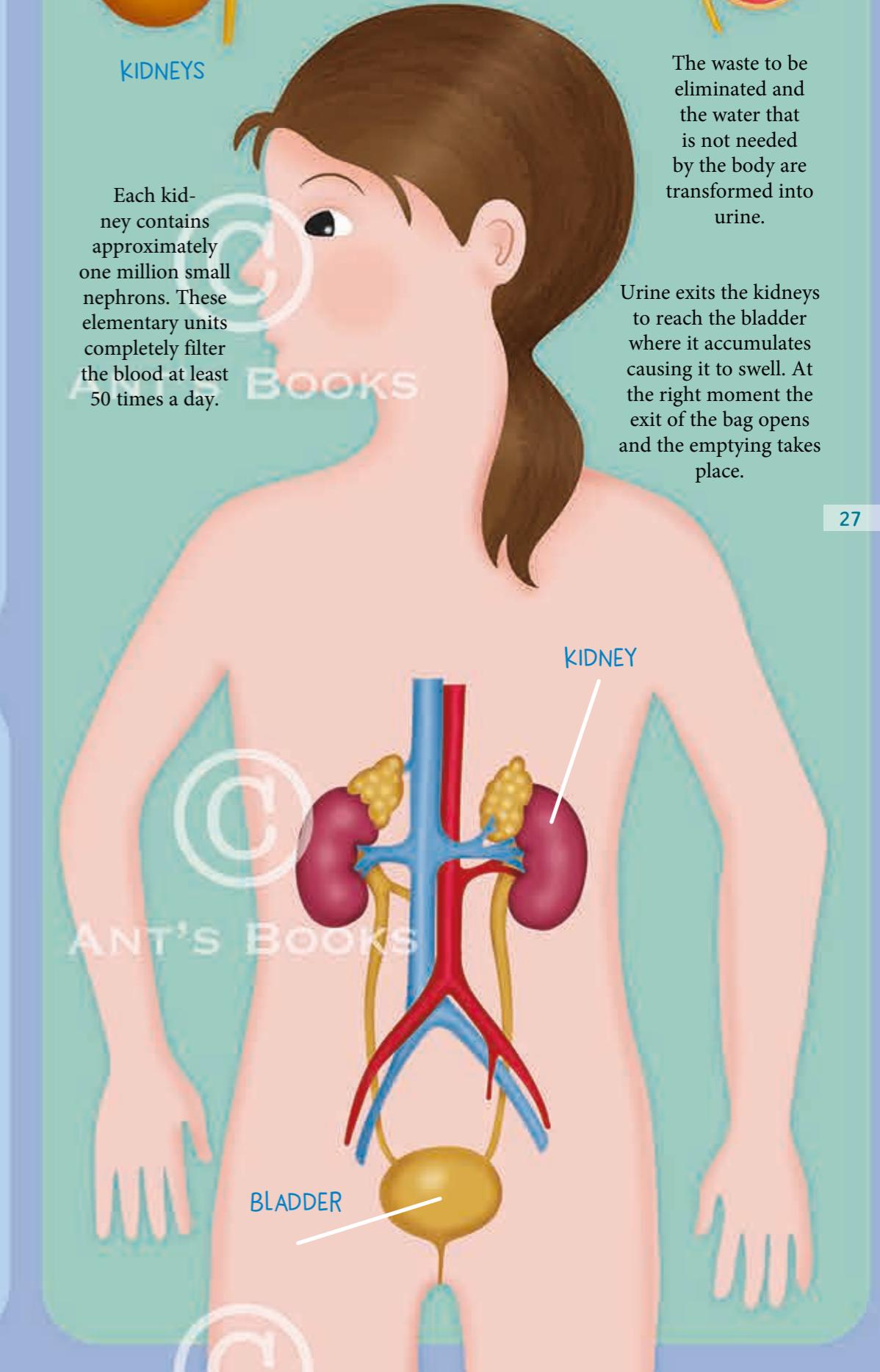
The water we drink every day serves to replace what we lose with sweat, with urine but also with simple breathing



The kidneys are two rather small organs that perform an important task of cleaning the blood. They are the ones who regulate the amount of water and waste present in the circulation.

## KIDNEYS

Each kidney contains approximately one million small nephrons. These elementary units completely filter the blood at least 50 times a day.



The waste to be eliminated and the water that is not needed by the body are transformed into urine.

Urine exits the kidneys to reach the bladder where it accumulates causing it to swell. At the right moment the exit of the bag opens and the emptying takes place.

# THE DEFENSES

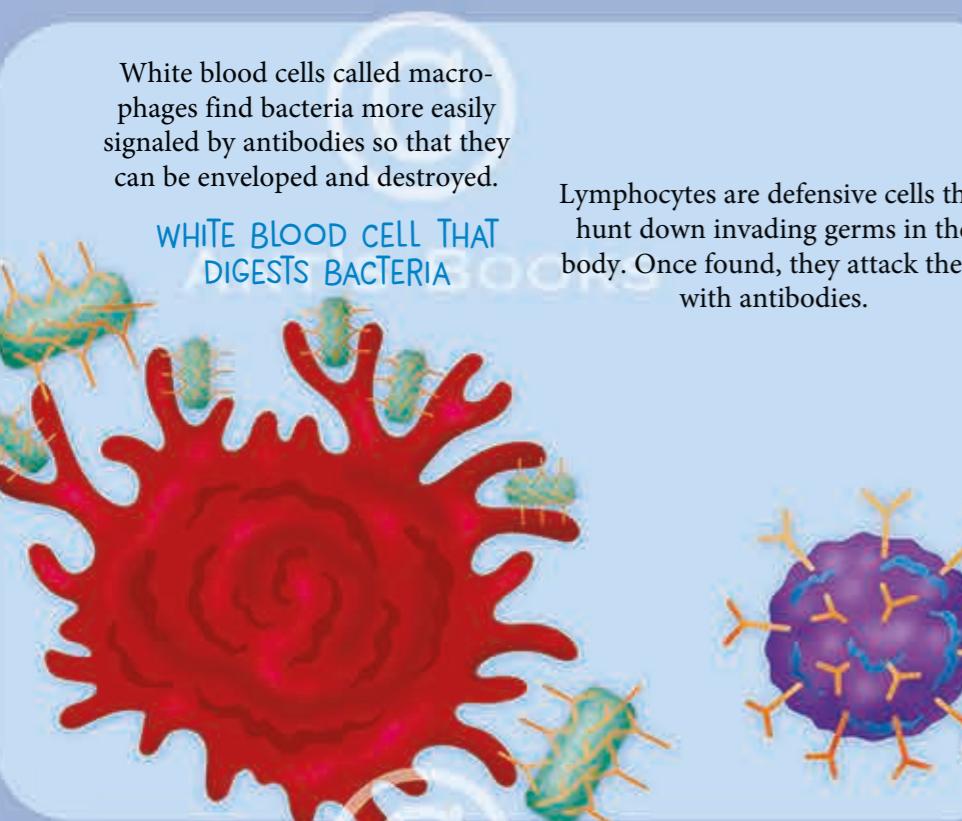
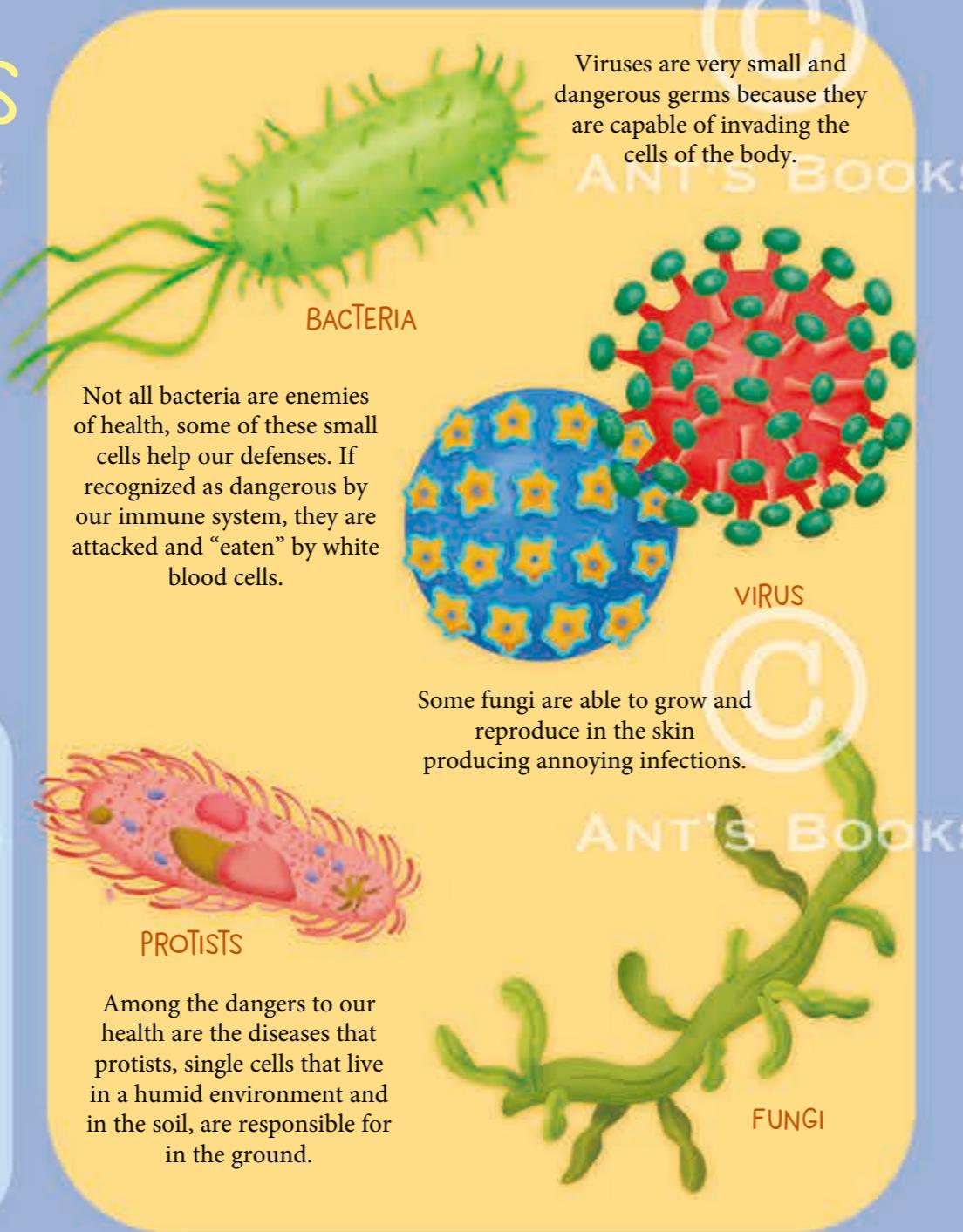
## ANT'S BOOKS

The body is continually threatened by microorganisms that can cause disease. The skin is the first defense, if the attackers are able to overcome this barrier they are faced by the group of organs and cells that make up the immune system.



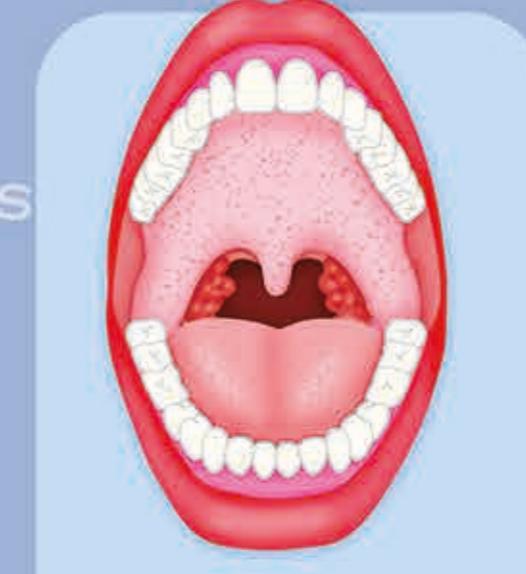
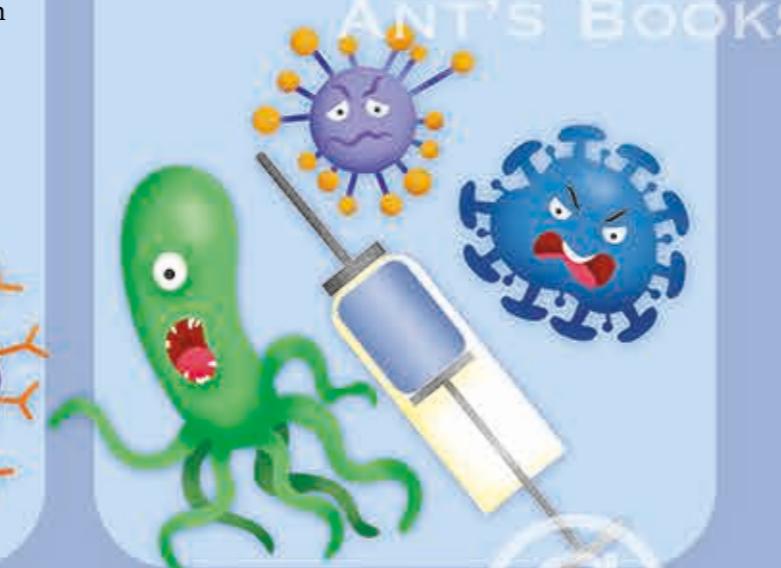
When we become unwell and feel the chills of fever, we are receiving the signal of an attack by viruses or bacteria. The first reaction of the body is the rise in temperature capable of slowing down the proliferation of aggressors coming from outside and stimulating the reaction of our defenses.

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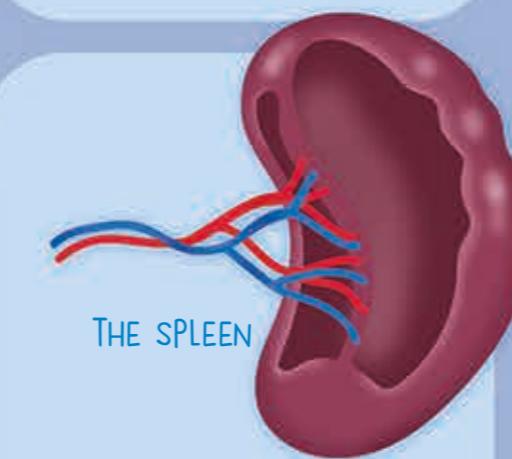


## THE VACCINES

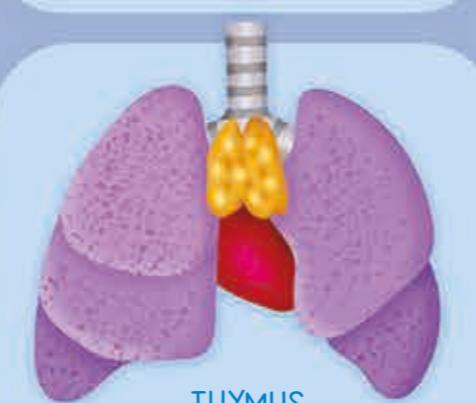
Vaccines are used to stimulate our body to produce antibodies that remain active for a long time. In this way we will be able to defend ourselves better and faster from infections.



**THE TONSILS**  
They are the sentinels of the mouth, if an infection appears they swell and they hurt as they increase the production of immune cells.



**THE SPLEEN**  
The spleen is the main organ of the lymphatic system. It contains many of the lymphocytes that protect us from harmful bacteria that enter the body.

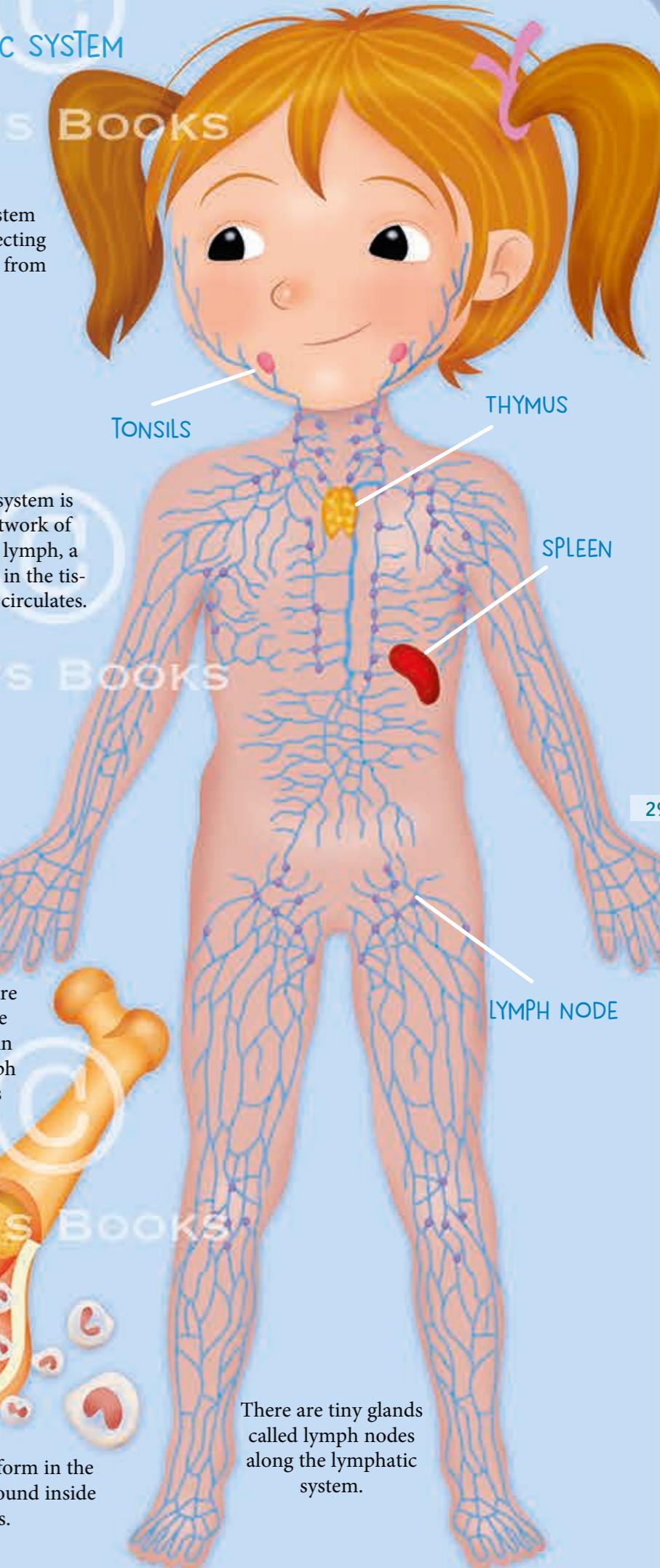


**THYMUS**  
It has the task of developing the cells that defend the body called T lymphocytes. The thymus develops during childhood but loses its effectiveness when we become adults.

## LYMPHATIC SYSTEM

## ANT'S BOOKS

The lymphatic system has the job of protecting the internal organs from infection.



The lymphatic system is formed by a network of vessels in which lymph, a liquid that forms in the tissues of the body, circulates.

## ANT'S BOOKS

White blood cells are the sentinels of the body. They travel in the blood and lymph to destroy viruses and bacteria.



White blood cells form in the marrow which is found inside the bones.

There are tiny glands called lymph nodes along the lymphatic system.

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# SKIN AND TOUCH

ANT'S BOOKS

The whole body is covered by the skin, a protective barrier capable of defending us from the invasions of the germs responsible for many diseases. In addition, this organ protects us from harmful sun rays, helps maintain the right internal temperature and prevents the body from drying out.



## FINGERPRINTS

The skin covering the fingertips forms small circular folds useful for grasping objects. The imprint left by these folds is different and unique for each individual



## THE NAILS

The nails protect the ends of the fingers and toes. They are made up of keratin, the same substance that makes up hair but are much harder due to the presence of mineral salts. At the base they have a white crescent from which they arise and develop. They are produced by the skin and grow several centimeters each year.

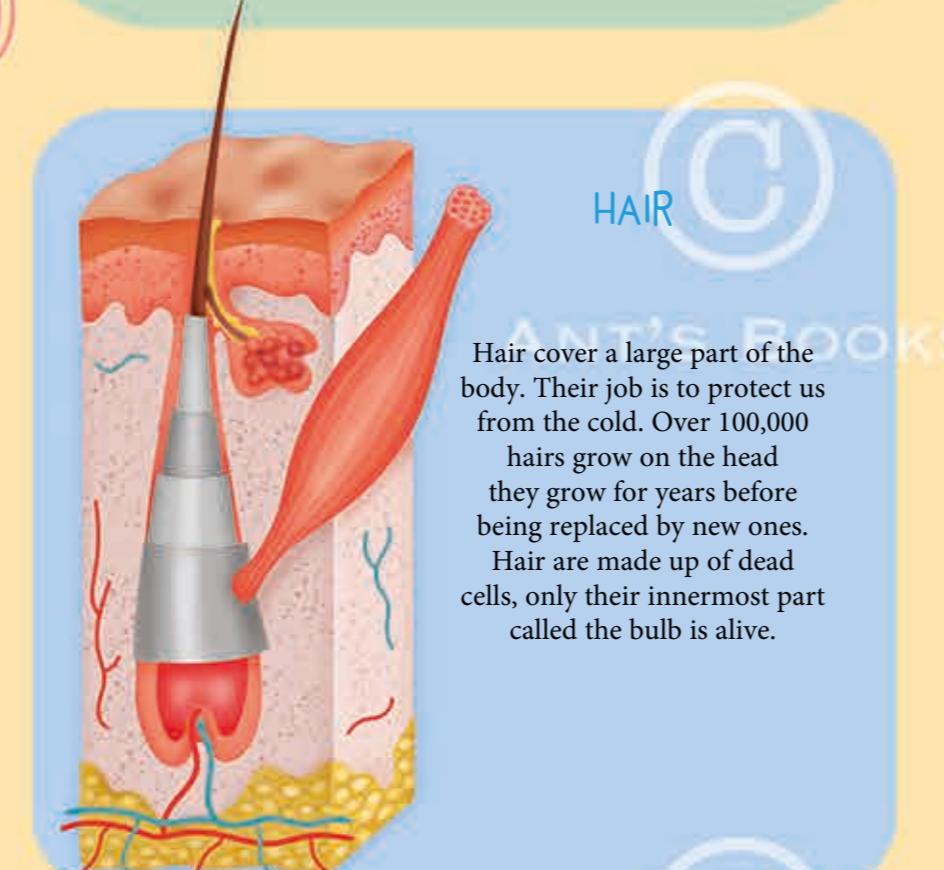


## THE COLOR OF THE SKIN

The skin can have different colors depending on the amount of melanin that each of us produces.

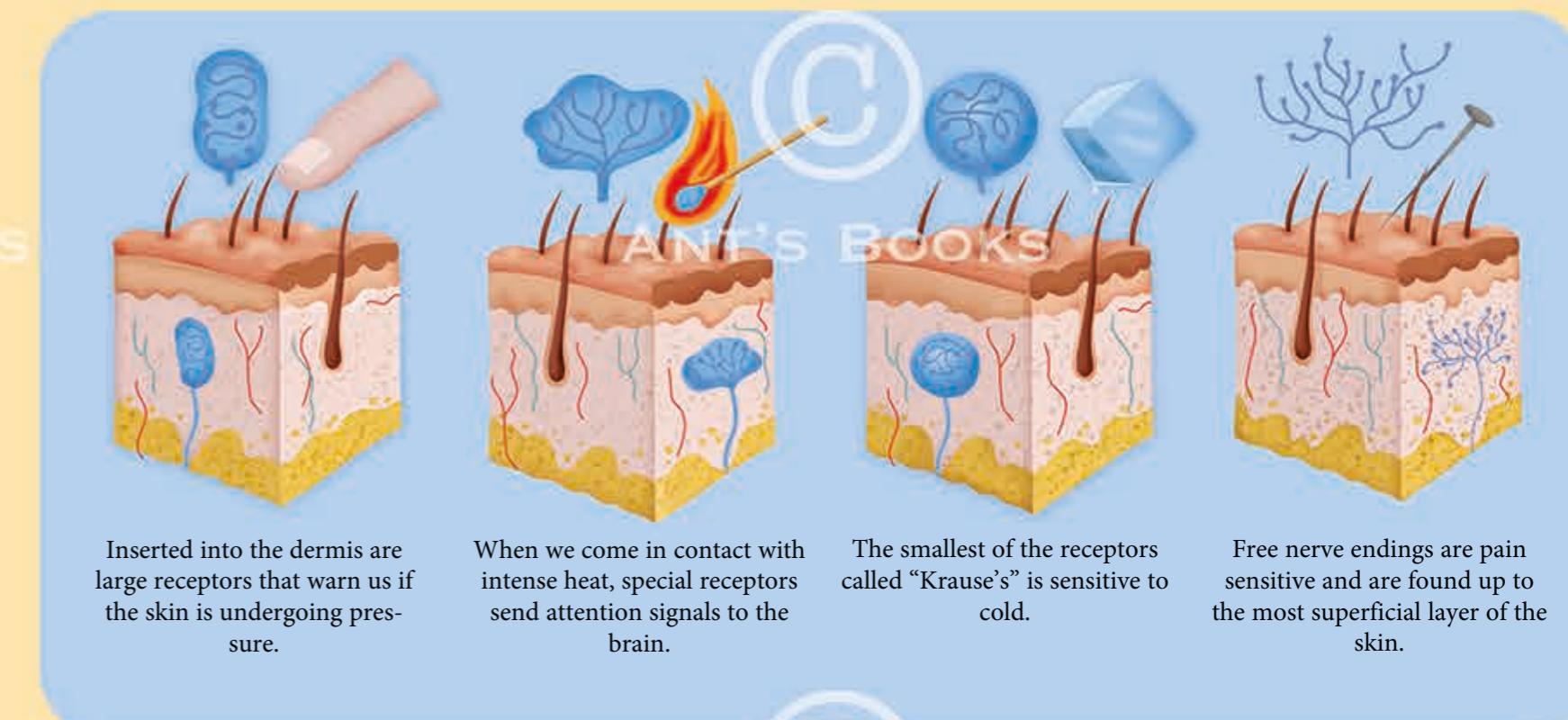
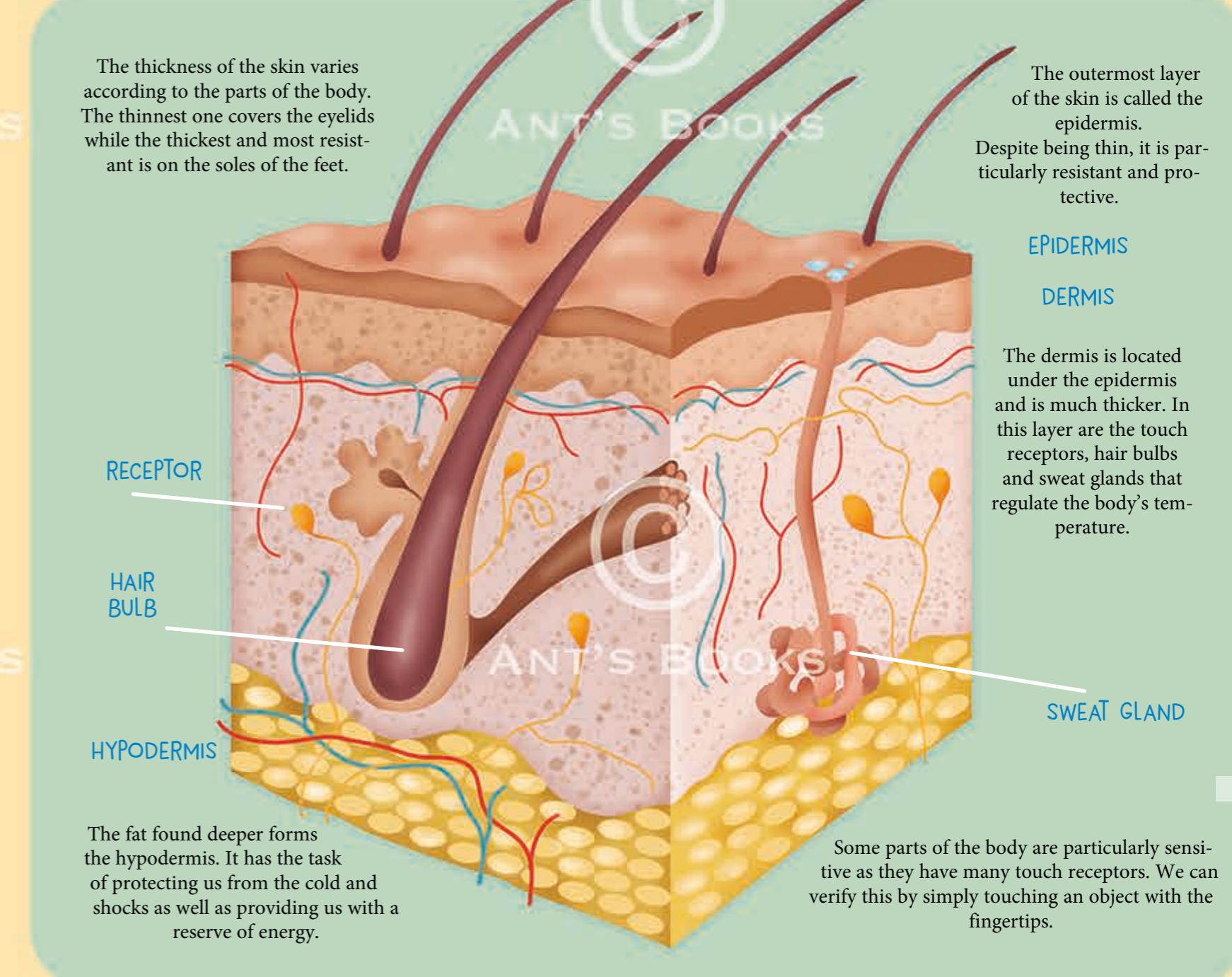
The greater the quantity of this natural pigment, the darker the skin tone becomes.

Melanin protects us from damage caused by the sun's rays. For this reason, in hot countries, the population has darker skin in order to better defend themselves from the effects of the sun.



## HAIR

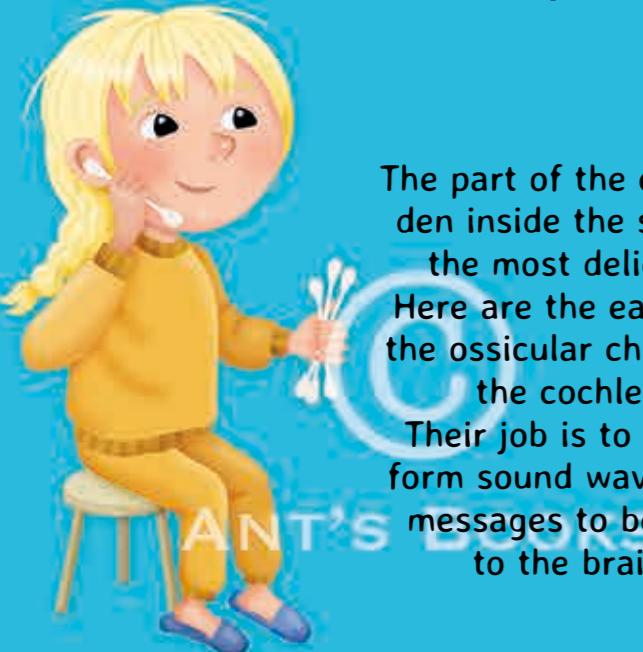
Hair cover a large part of the body. Their job is to protect us from the cold. Over 100,000 hairs grow on the head they grow for years before being replaced by new ones. Hair are made up of dead cells, only their innermost part called the bulb is alive.



# HEARING AND SIGHT

## ANT'S BOOKS

The sounds and words we hear are produced by air vibrations that reach our ears. Here they are captured by the external auricle which collects them and sends them towards the eardrum making it vibrate.



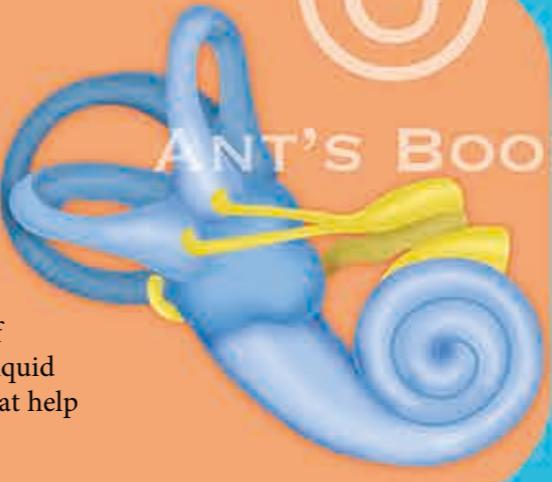
The earwax we have inside our ears serves as protection but must be removed if it becomes too abundant.

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## THE COCLEA

The vibrations of the eardrum arrive at the cochlea where they are transformed into nerve impulses.

Above the cochlea is the organ of equilibrium full of liquid, when we move this liquid sends signals to the brain that help keep us stable.

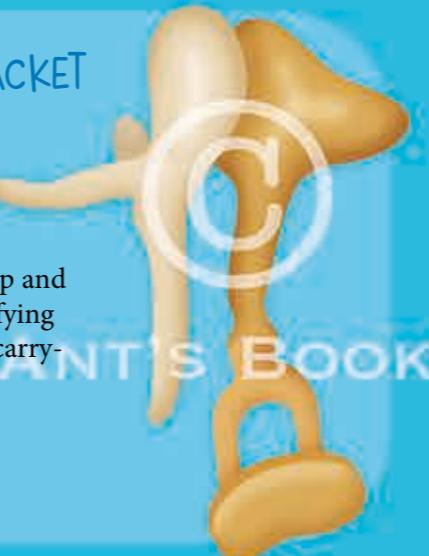


**ANVIL AND HAMMER BRACKET**  
The part of the ear hidden inside the skull is the most delicate. Here are the eardrum, the ossicular chain and the cochlea. Their job is to transform sound waves into messages to be sent to the brain.

## ANVIL AND HAMMER BRACKET

A chain formed by three tiny ossicles connects the eardrum membrane to the inner part of the ear.

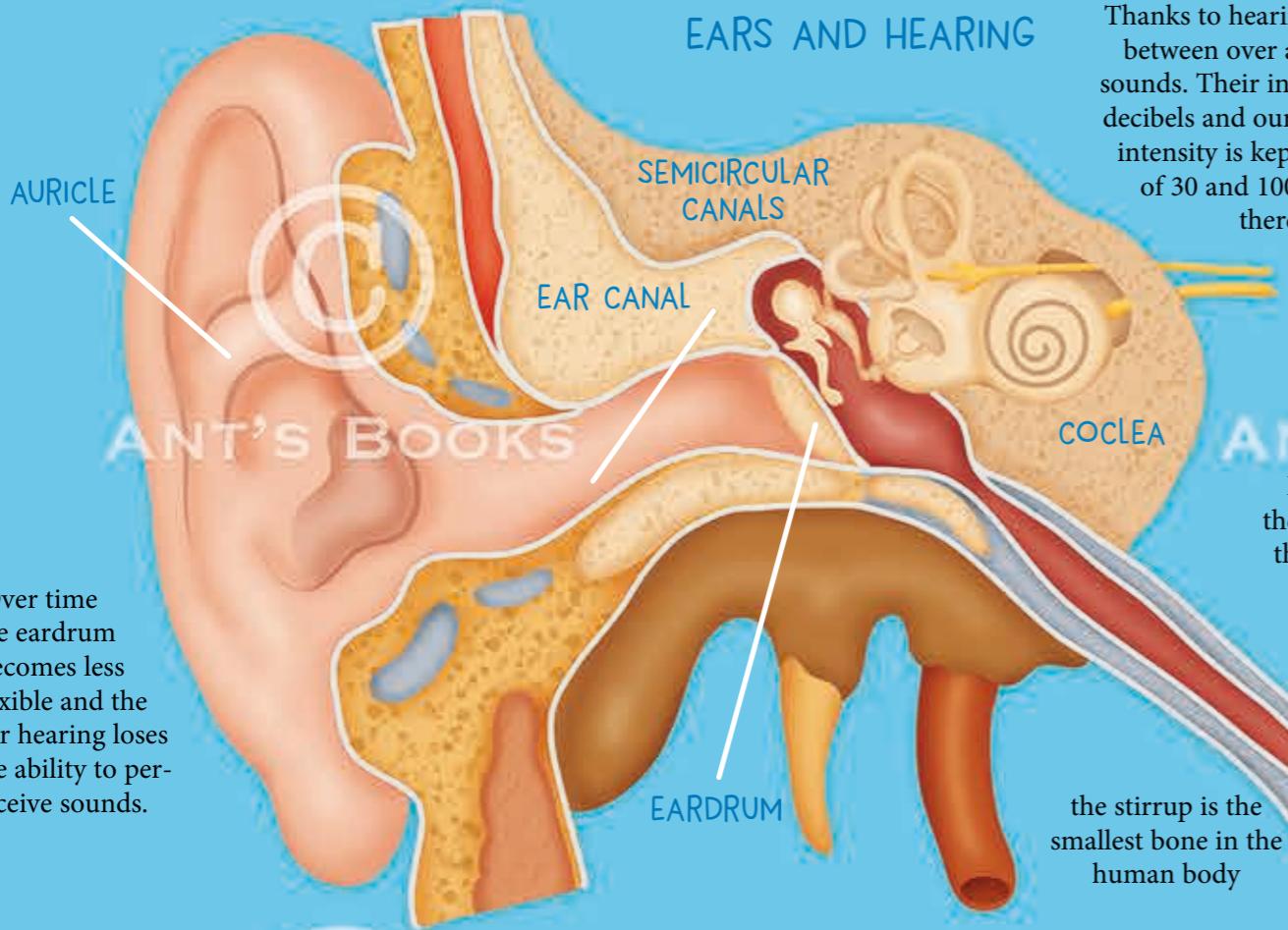
They are called hammer, anvil and stirrup and have the task of transmitting and amplifying the vibrations collected by the eardrum carrying them up to the cochlea.



The earwax we have inside our ears serves as protection but must be removed if it becomes too abundant.

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## EARS AND HEARING



Over time the eardrum becomes less flexible and the our hearing loses the ability to perceive sounds.

Thanks to hearing we can distinguish between over a thousand different sounds. Their intensity is measured in decibels and our ear works well if this intensity is kept between the values of 30 and 100. Above 130 decibels there can be permanent damage to hearing.

Behind the eardrum there is a canal that puts the ear in contact with the throat.

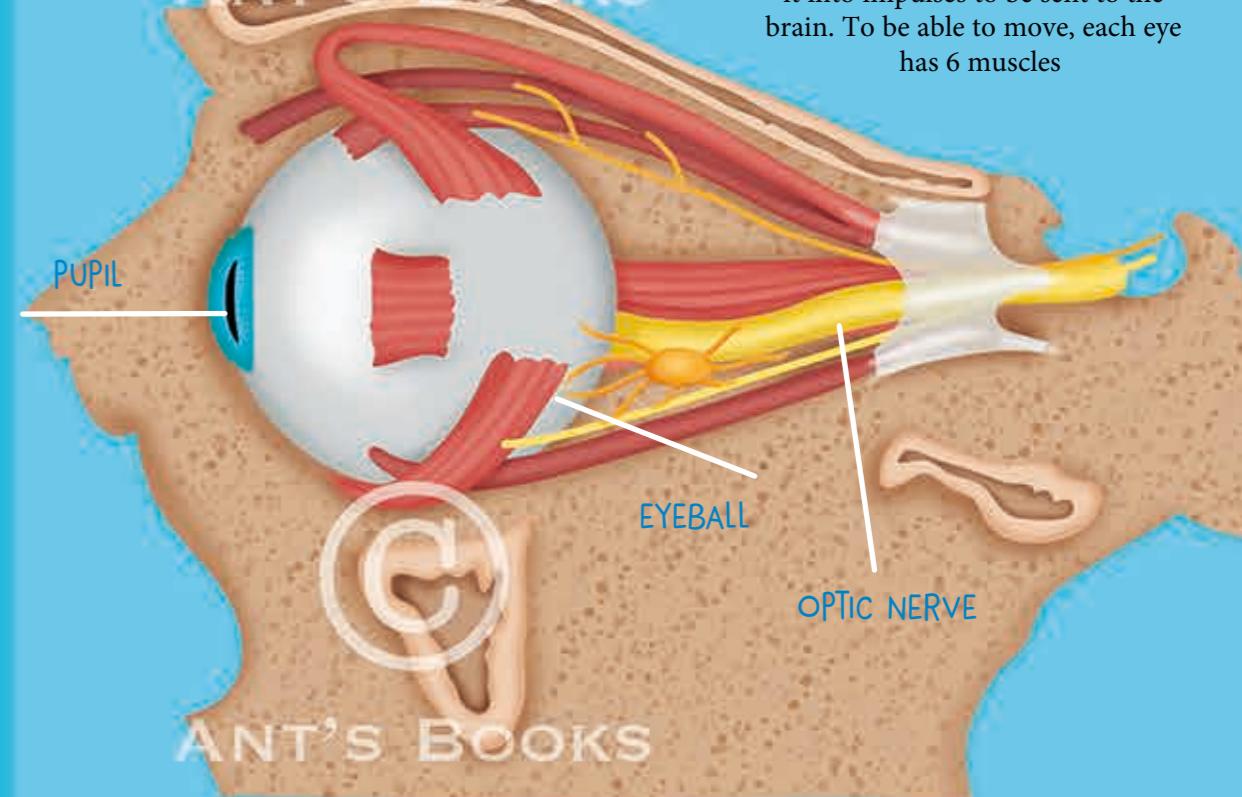
the stirrup is the smallest bone in the human body



## THE EYE AND SIGHT

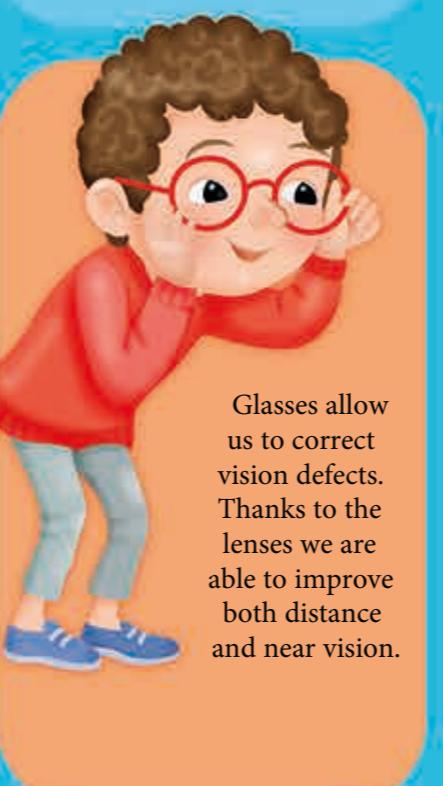
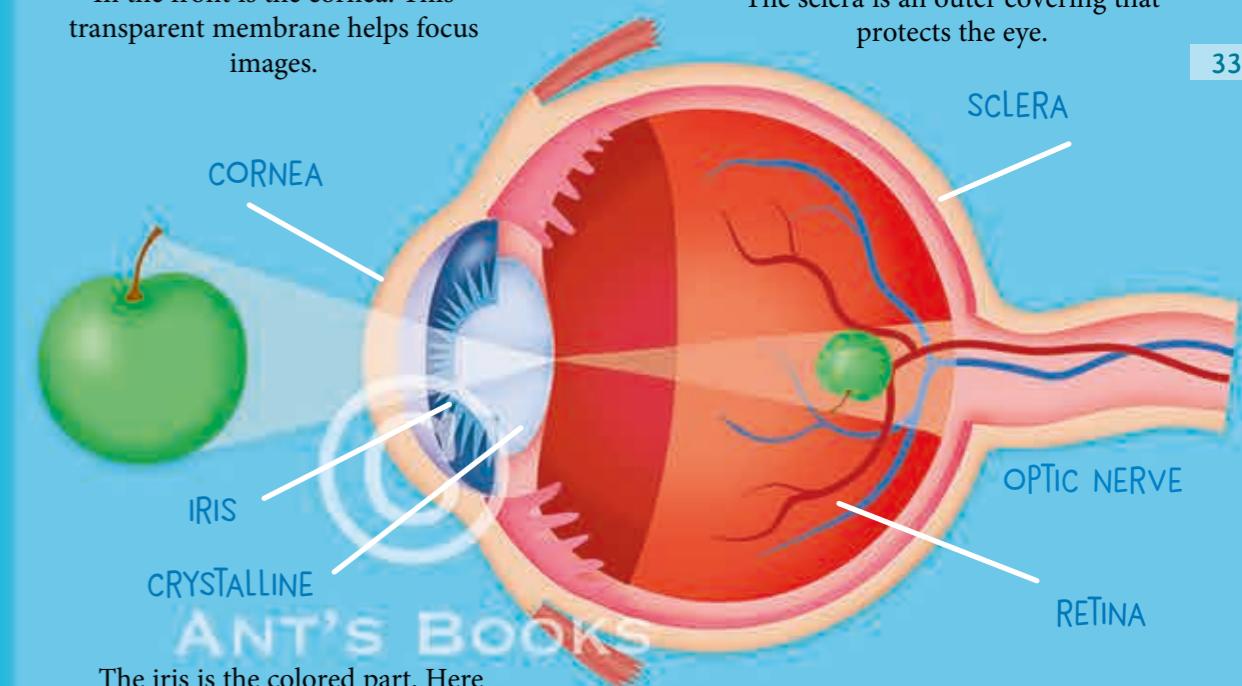
## ANT'S BOOKS

The eye has the important task of capturing light by transforming it into impulses to be sent to the brain. To be able to move, each eye has 6 muscles



In the front is the cornea. This transparent membrane helps focus images.

The sclera is an outer covering that protects the eye.



The iris is the colored part. Here are the small muscles that open and close the pupil.

An inverted image is formed on the retina and is then straightened by the brain.

After passing through the cornea and the lens, the light rays reach the retina. Here are light-sensitive cells that can send signals to the brain.

The optic nerve transmits signals from the retina to the brain where they will be transformed into images.

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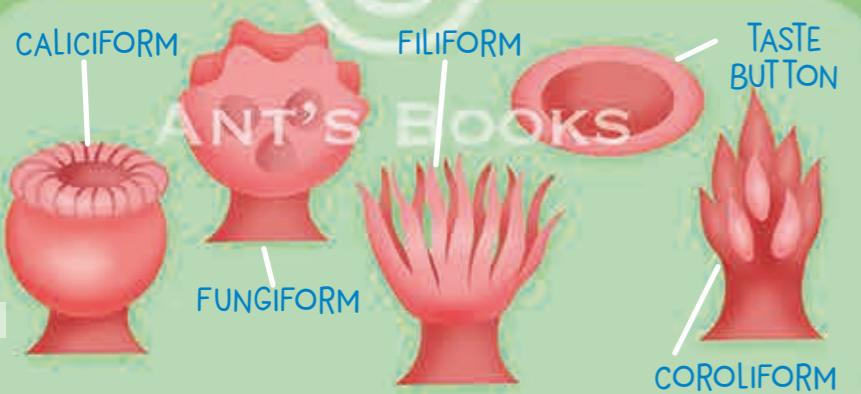
# TAKE AND SMELL

## ANT'S BOOKS

Taste helps us to perceive the taste of food and drinks as they pass through the mouth. Thanks to this we can taste what we eat but also be warned if we are ingesting something unpleasant that could make us sick.

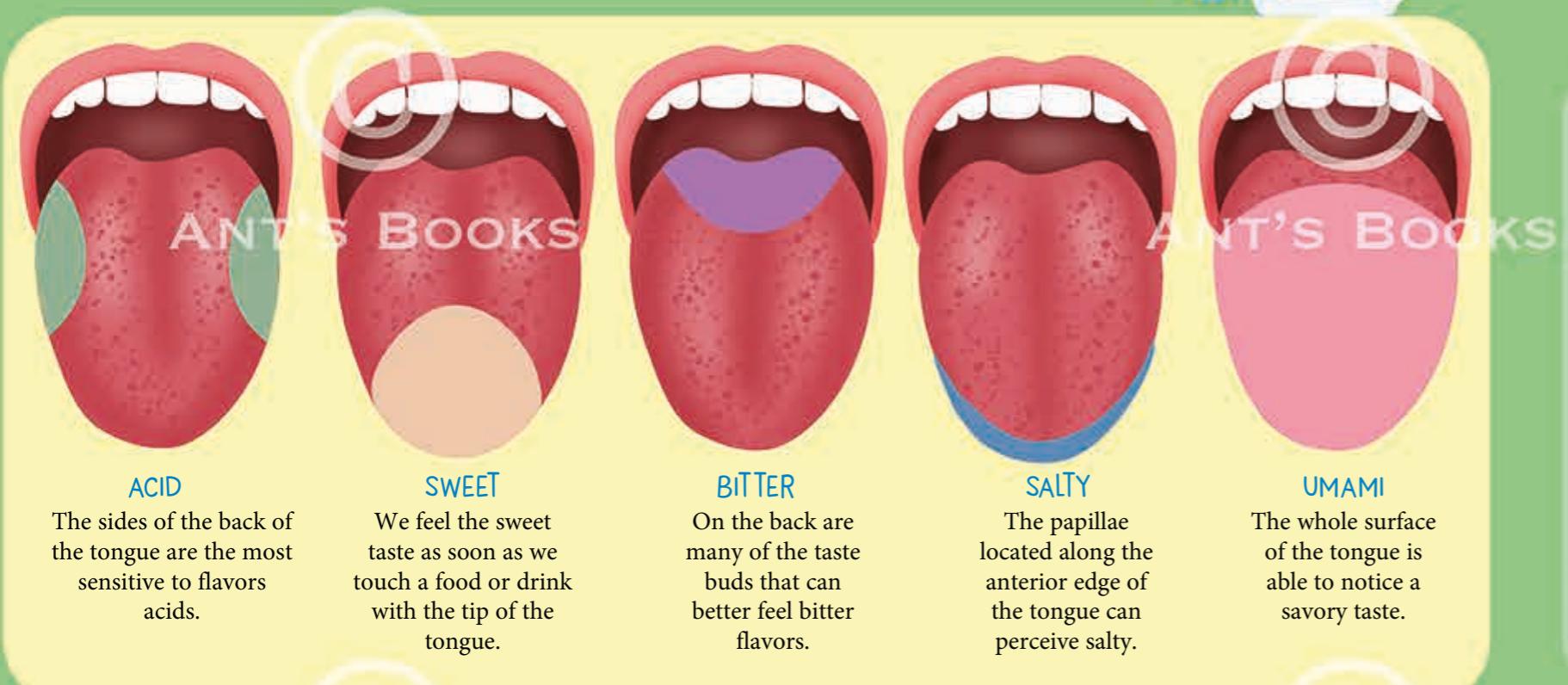


Babies' tongues are almost entirely covered with gustatory buttons so their sense of taste is more pronounced than that of adults.



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There are 5,000 to 10,000 papillae on the tongue. The filiform ones only feel the touch and the temperature of what we eat while the others contain the cells that recognize tastes.



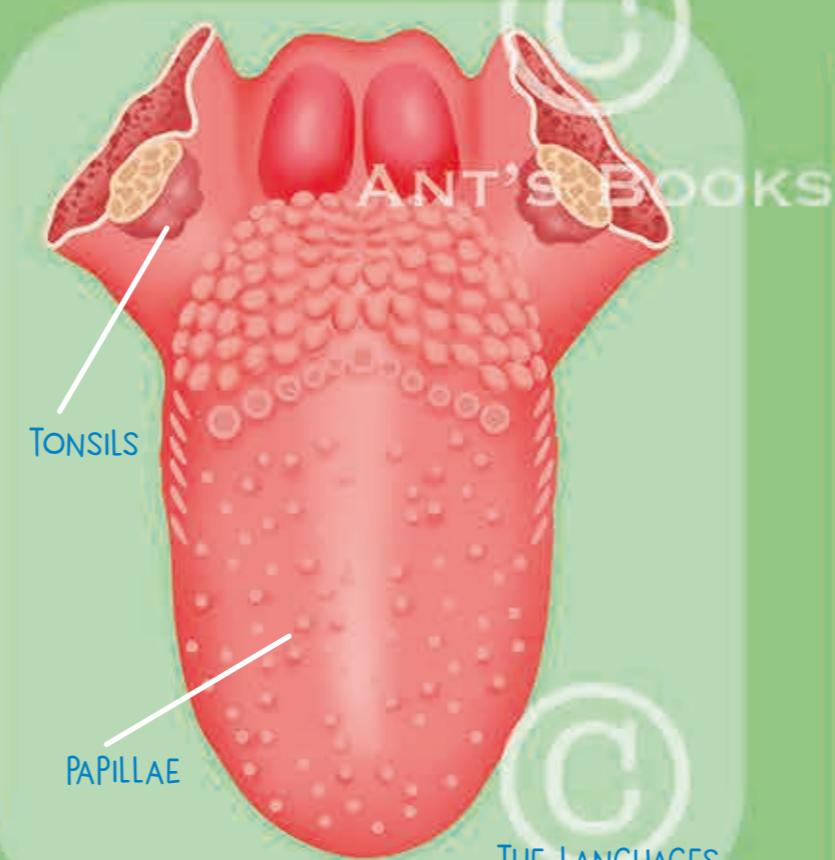
The sides of the back of the tongue are the most sensitive to flavors acids.

**SWEET**  
We feel the sweet taste as soon as we touch a food or drink with the tip of the tongue.

**BITTER**  
On the back are many of the taste buds that can better feel bitter flavors.

**SALTY**  
The papillae located along the anterior edge of the tongue can perceive salty.

**UMAMI**  
The whole surface of the tongue is able to notice a savory taste.

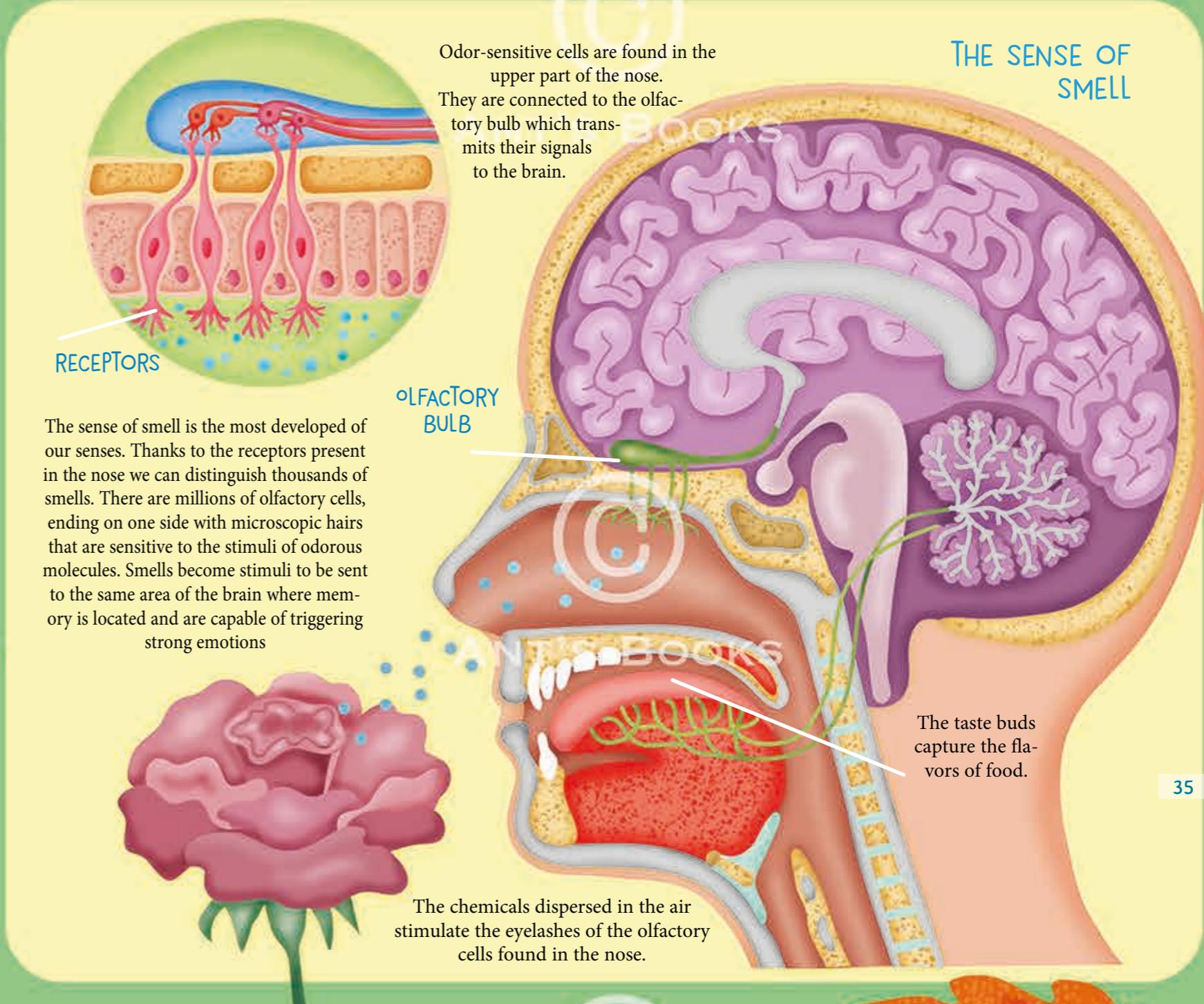


## THE LANGUAGES ANT'S BOOKS

The tongue is lined with tiny protrusions called papillae. Inside are the taste buds that recognize the five fundamental flavors



Spicy foods do not have a real taste but are capable of causing painful stimuli in the tongue.



Dogs have a much more developed sense of smell than ours. Their nose has a much higher number of olfactory receptors than that of humans, for this reason they are able to smell smells at great distances.



The air we breathe carries not only smells. Sometimes it brings with it dust, flower pollen or other impurities that can be very annoying if they come into contact with our nose or our eyes. Some people are particularly sensitive to these substances and react with severe sneezing, coughing and redness of the skin. They are called allergy sufferers and must keep as far away as possible from what is irritating to them.



## THE SENSE OF SMELL

Odor-sensitive cells are found in the upper part of the nose. They are connected to the olfactory bulb which transmits their signals to the brain.

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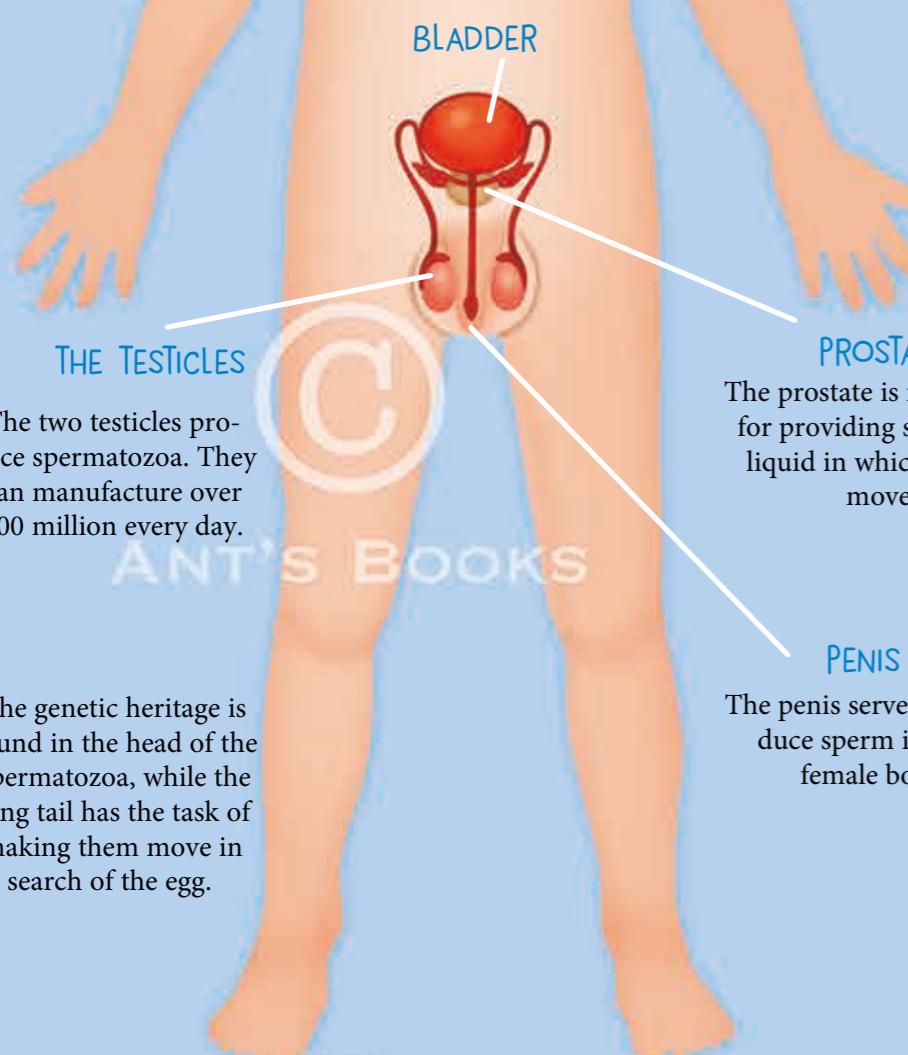
# REPRODUCTION

ANT'S BOOKS

## MALE GENITAL SYSTEM

Boys enter puberty around age 11 and continue to make changes up to 18. In this period their body takes on an adult appearance.

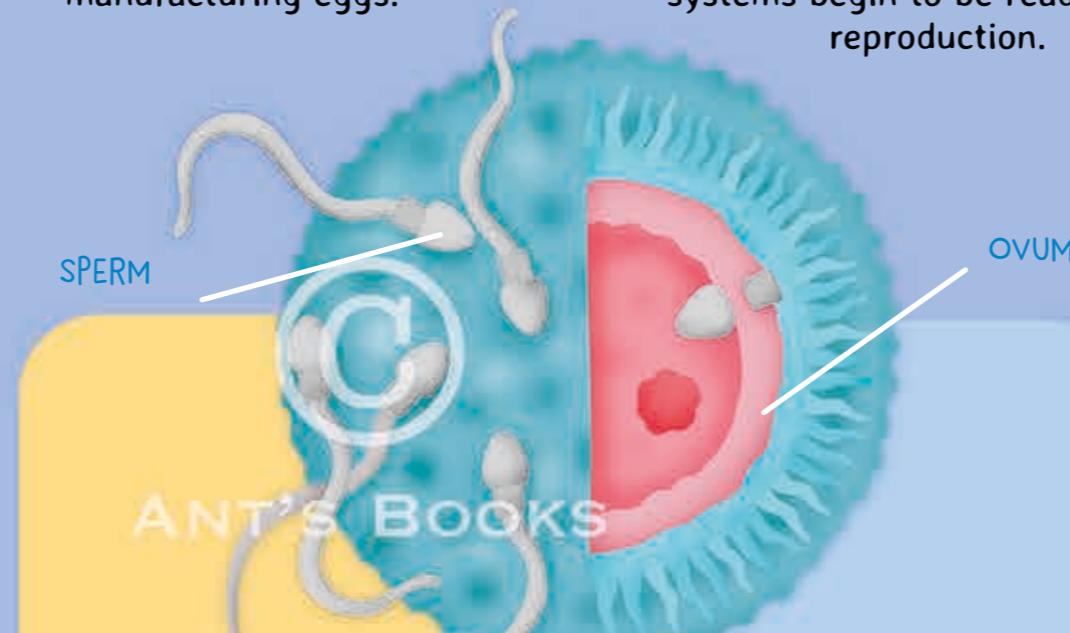
ANT'S BOOKS



Men and women have systems that change according to sex.

It is the reproductive system which in males specializes in the production of spermatozoa while in females it has the task of manufacturing eggs.

ANT'S BOOKS



By swimming with their long tails, the spermatozoa make a long journey that can last a whole day.

Only a hundred of them manage to reach the fallopian tube in search of an egg. After finding it, they surround it and start trying to sneak inside.



One of the most noticeable changes in the male body during puberty is the growth of facial hair. The voice also changes from a high pitch to a more serious and profound one.

The female and male apparatus are suitable for bringing together the sex cells and creating a new life. Once puberty is reached, the period in which the transition between childhood and adulthood takes place, the two systems begin to be ready for reproduction.

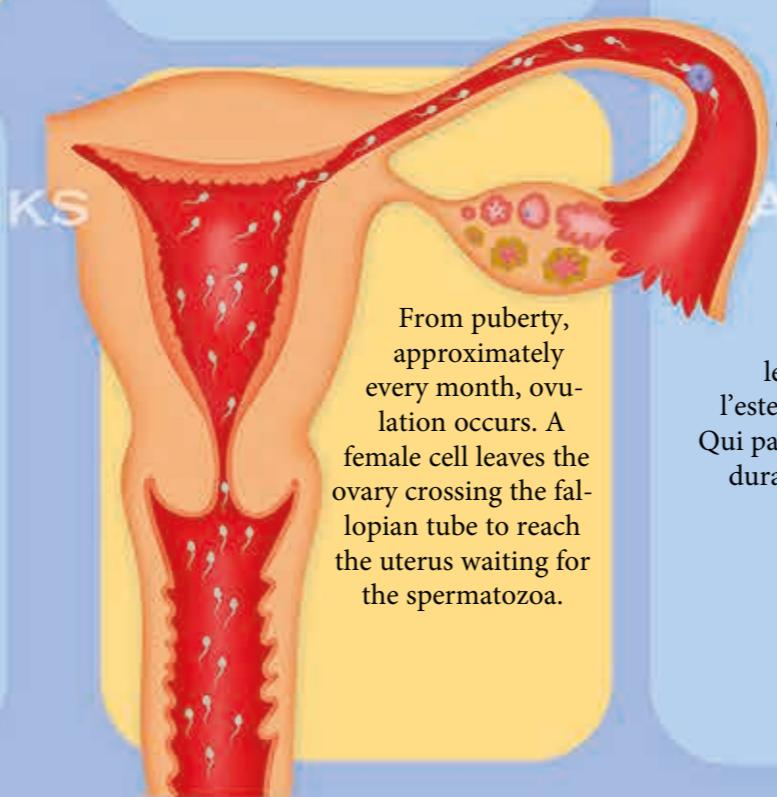
ANT'S BOOKS

## FEMALE GENITAL SYSTEM

In girls, puberty-related changes usually occur between the ages of 10 and 14.

ANT'S BOOKS

Only one sperm can penetrate the egg. The tail remains outside while the nucleus contained in the head merges with the female egg, forming a new cell called the zygote. This first "brick" will divide creating a small cluster of cells that will start a new life.

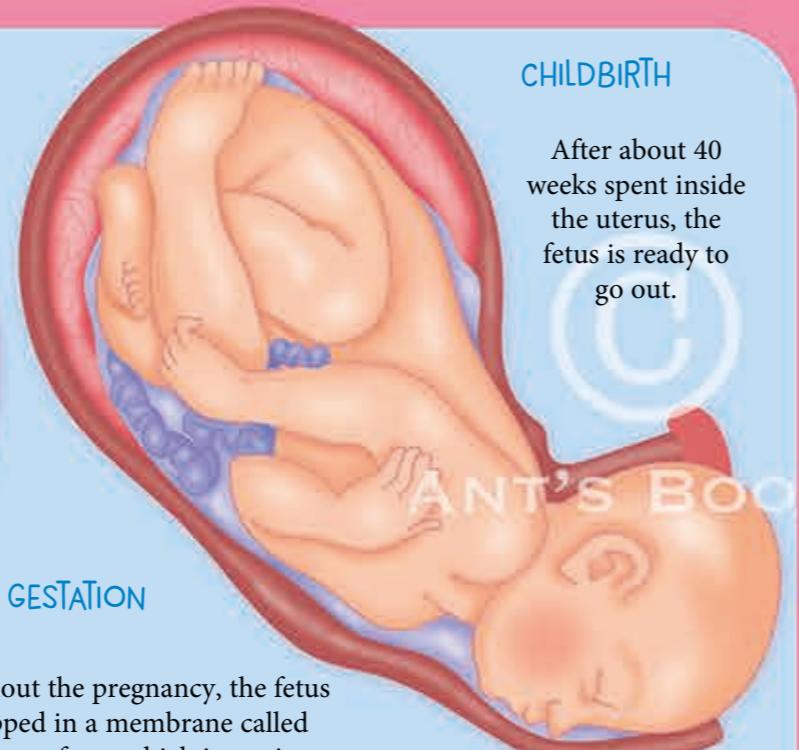
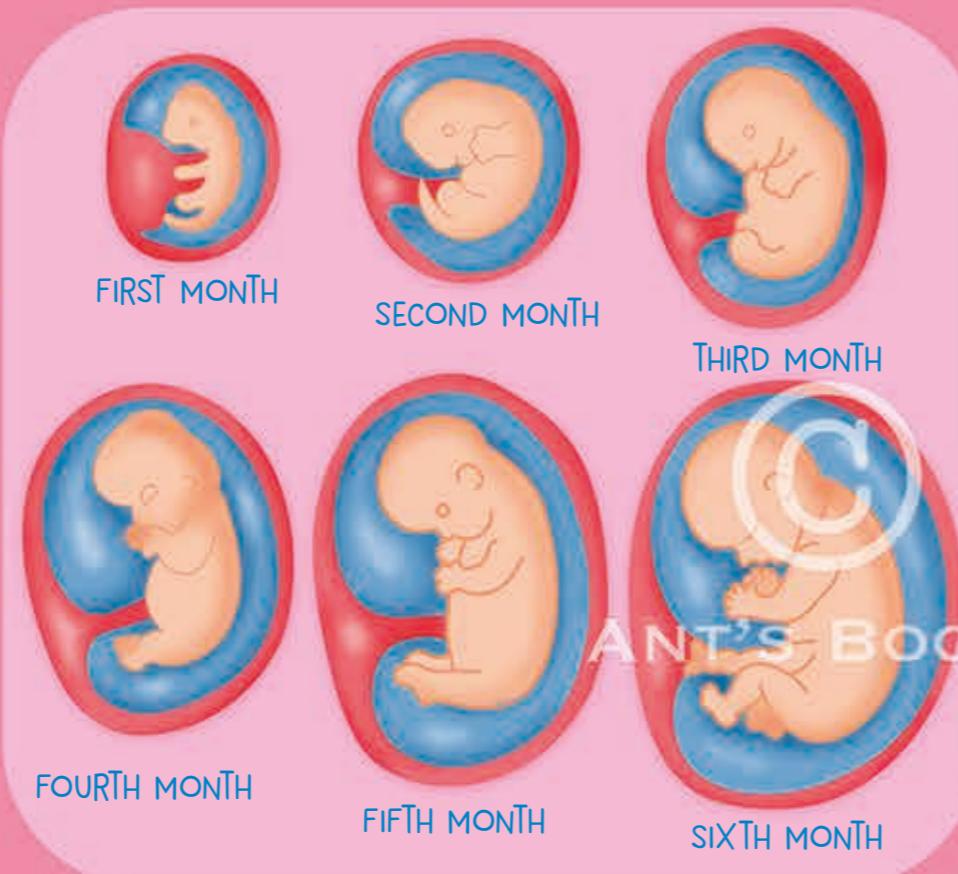


During adolescence, the bodies of young women show great transformations. The breasts grow and develop as the pelvis widens to accommodate future pregnancies.

# THE BIRTH

ANT'S BOOKS

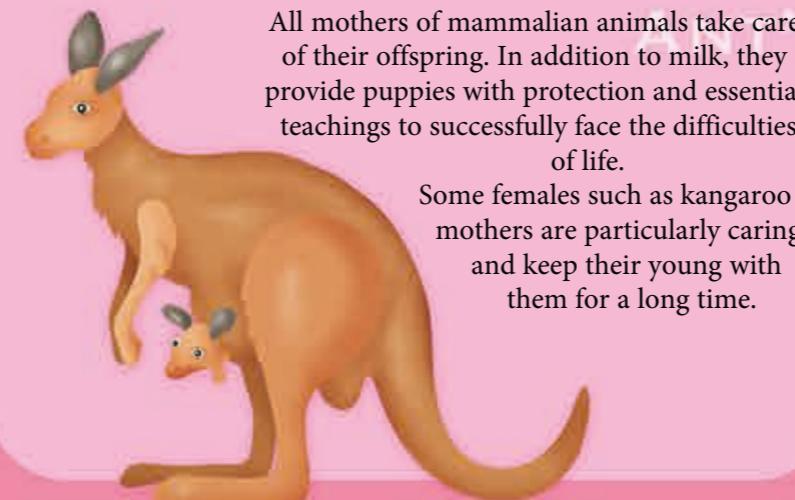
After the union of the male sperm with the female egg, pregnancy begins. During the first 8 weeks the future baby is an embryo. During this time, the brain and other organs begin to develop. At 8 weeks, it became a fetus capable of making its first movements.



Throughout the pregnancy, the fetus is wrapped in a membrane called the placenta from which it receives oxygen and nutrition. The amniotic fluid that the uterus is full of protects it from shocks.

Positioning with the head facing down, the baby prepares to be pushed out of the mother's body

## MAMMALS



All mothers of mammalian animals take care of their offspring. In addition to milk, they provide puppies with protection and essential teachings to successfully face the difficulties of life.

Some females such as kangaroo mothers are particularly caring and keep their young with them for a long time.

## BE BORN FROM AN EGG

Other animals entrust the fate of the offspring to eggs which contain the embryo of a new creature and what is necessary to face the first moments of life. Many eggs are abandoned to their fate but others are looked after by one or both parents.



## THE STAGES OF GROWTH

Already around three months old, the newborn is able to hold his head up independently to look at the outside world.

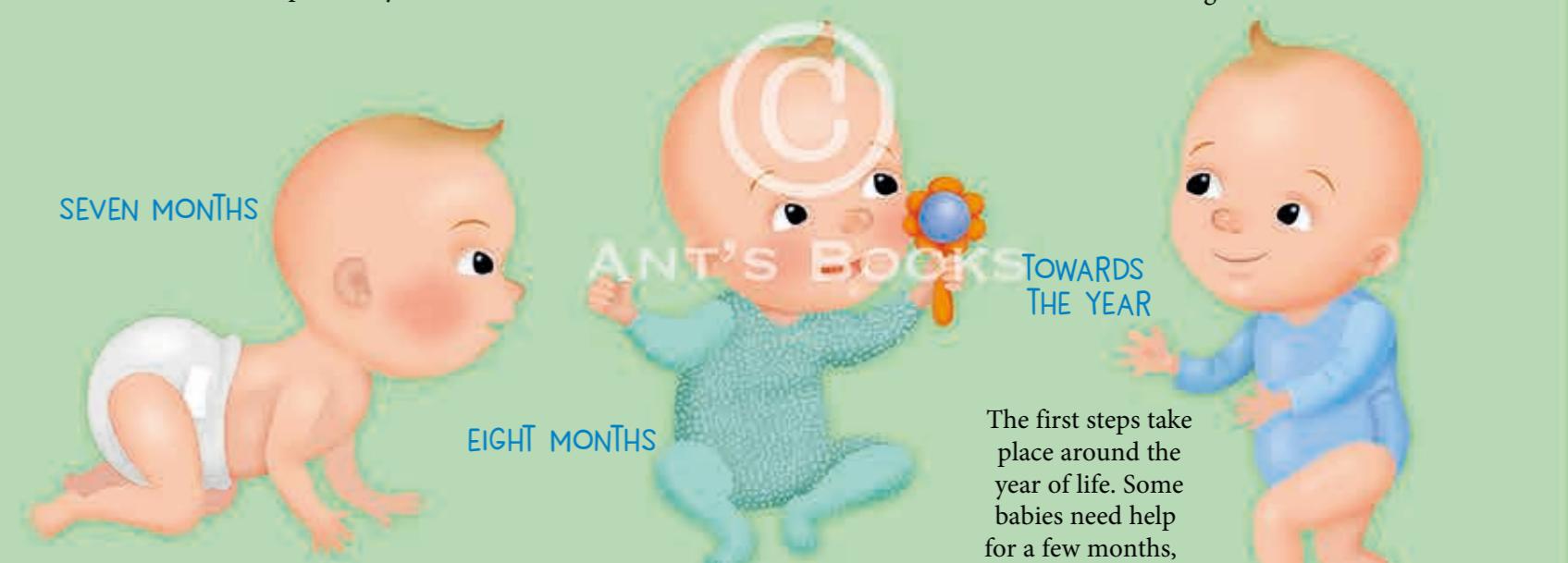


ONE MONTH

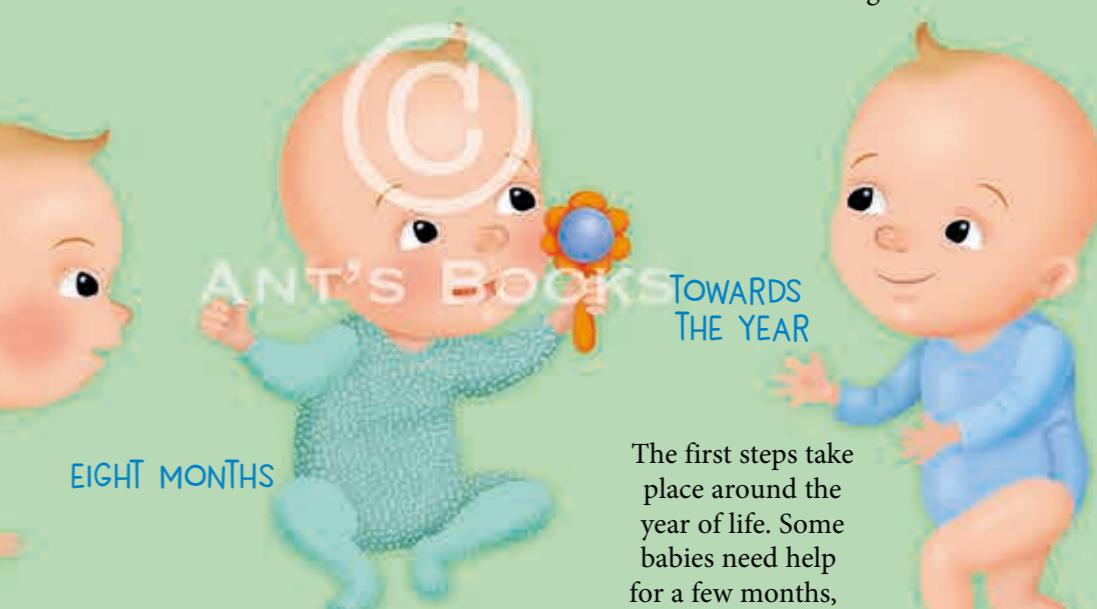


THREE MONTH

The first sounds emitted by the child are short repeated syllables, this phase of growth is called "lallation".



SEVEN MONTHS



EIGHT MONTHS

The first steps take place around the year of life. Some babies need help for a few months, others are quicker to learn.



Between six and eight months, the baby can sit without having need support.

# TO THE DOCTOR

Usually our body works very well but can be attacked by very small "enemies" called viruses and bacteria and to get sick.

In these cases the immune system intervenes and organizes our defenses by activating special white blood cells capable of recognizing and destroying the "invaders".



## PERSONAL HYGIENE

Our skin is the first defense against microbes and must be kept clean to prevent those that settle on it from causing infections. A good wash with soap and water is one of the best remedies to protect ourselves from these tiny health enemies.



## TO THE DOCTOR

Sometimes our immune systems need help in overcoming the disease. The doctor will tell us what are the right medicines to keep viruses and bacteria at bay.

## THE CONTAGION

Being in close contact with other people helps us socialize but can promote the transmission of diseases.

Viruses and bacteria are very good at exploiting moments of proximity to pass from one person to another. Sometimes a cough is enough to spread microbes in the air or drink from the same glass to be infected with a disease.



## SOME SIMPLE REMEDIES

Inside the first aid kit you will find everything you need for first aid.

Cotton, plasters, disinfectant are essential to heal wounds.

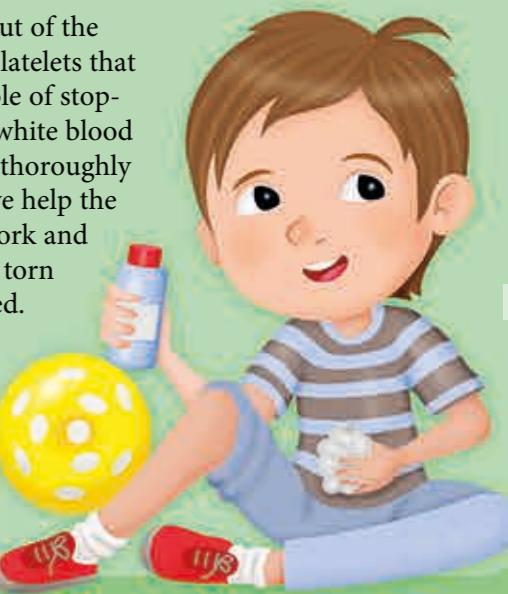
Dry ice and bandages are for minor injuries and bruises.



## WOUNDS AND ABRASIONS

When our skin tears our healing system kicks in.

The blood that comes out of the wound carries with it the platelets that serve to form a clot capable of stopping the bleeding and the white blood cells that attack germs. By thoroughly disinfecting the wound, we help the white blood cells in their work and increase the chances of the torn skin not becoming infected.



## INSECT BITES

Insects do not like to be disturbed and can react very badly if they feel threatened from our presence. We try to keep away from their bites which are very painful and can cause serious consequences.

## NOSEBLEEDS

If you notice droplets of blood coming out of the nose do not you must be scared.

This is usually a problem that is solved by pressing a finger against the bleeding nostril.

You will see that the small bleeding will stop in a few minutes



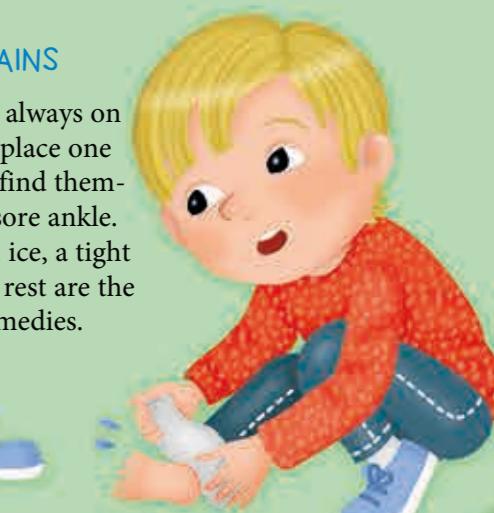
## BRUISES

The blows to the head leave annoying bumps but the damage can be limited by applying ice to the painful area.

If the pain becomes very severe it is best to consult a doctor.

## SPRAINS

Those who are always on the move can place one foot badly and find themselves with a sore ankle. In these cases, ice, a tight bandage and rest are the best remedies.





# GUESS-QUIZ

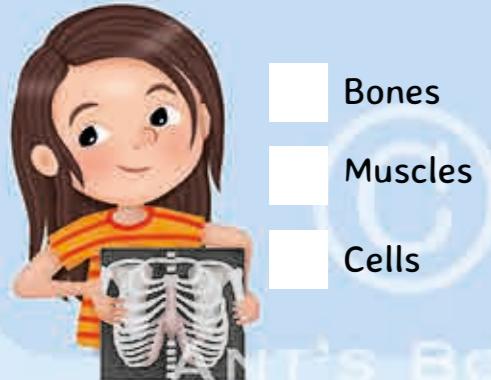


ANT'S BOOKS



ANT'S BOOKS

With X-rays we can observe:



- Bones
- Muscles
- Cells

Which side (hemisphere) of our brain controls logic and math?



- Right
- Left
- Both of them

These ear bones are called: Stirrup, anvil and ...



- Bolt
- Hammer
- Umbrella

This blood cell is called:

- Globulin
- Globule
- Both of them

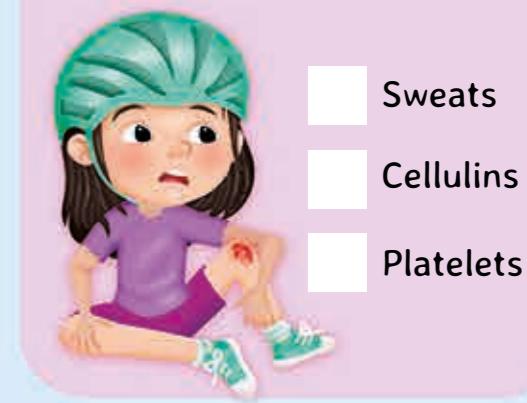


When you need to brush your teeth?



- After meals
- To smile
- Before meals

When you peel your knees, the ...



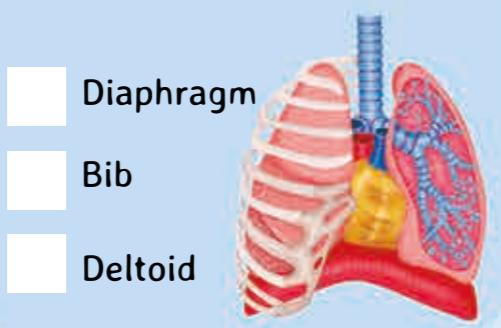
- Sweats
- Cellulins
- Platelets

on the tongue are located..



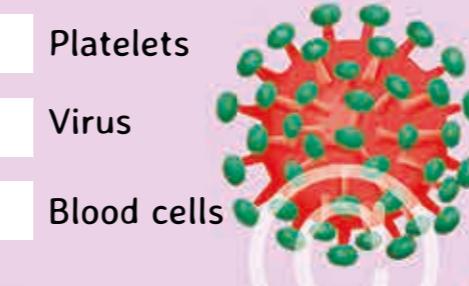
- Villus
- Papillae
- Pupils

The muscle that helps you breathe is ...



- Diaphragm
- Bib
- Deltoid

They are responsible for diseases:



- Platelets
- Virus
- Blood cells

What is the name of the muscle that causes the arm to bend?



- Buttock
- Bib
- Biceps

If you are sick you should measure with the thermometer:



In the stomach occurs:



- Digestion
- Circulation
- Breathing

How many liters of blood flow into our body?



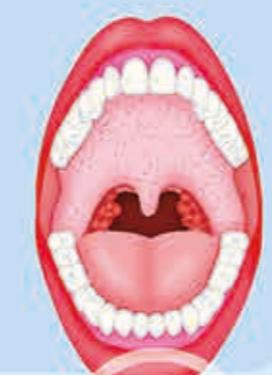
- 8
- 5
- 3

Can cause tooth decay:



- Vegetables
- Sweets
- Fruits

How many teeth can an adult have in his mouth?



- 22
- 42
- 32

This brain cell is called:



- Neurino
- Neuron
- Proton

Quanti mesi dura la gravidanza:



- 6
- 9
- 12

Only one of these organs resides in the eye:

- Tonsils
- eardrum
- Cornea

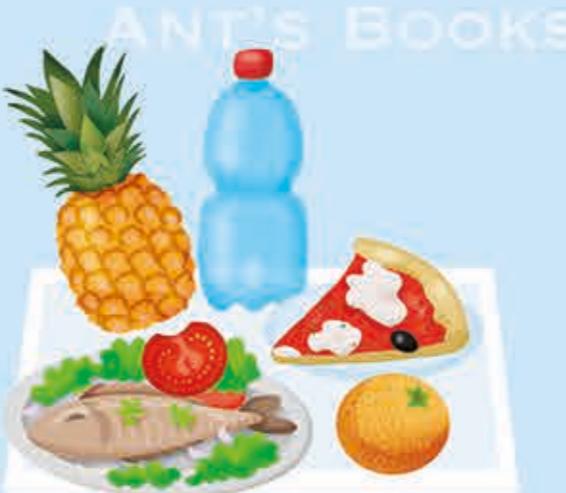
# LET'S PLAY WITH THE HUMAN BODY



Tray A

## THE TRAY GAME

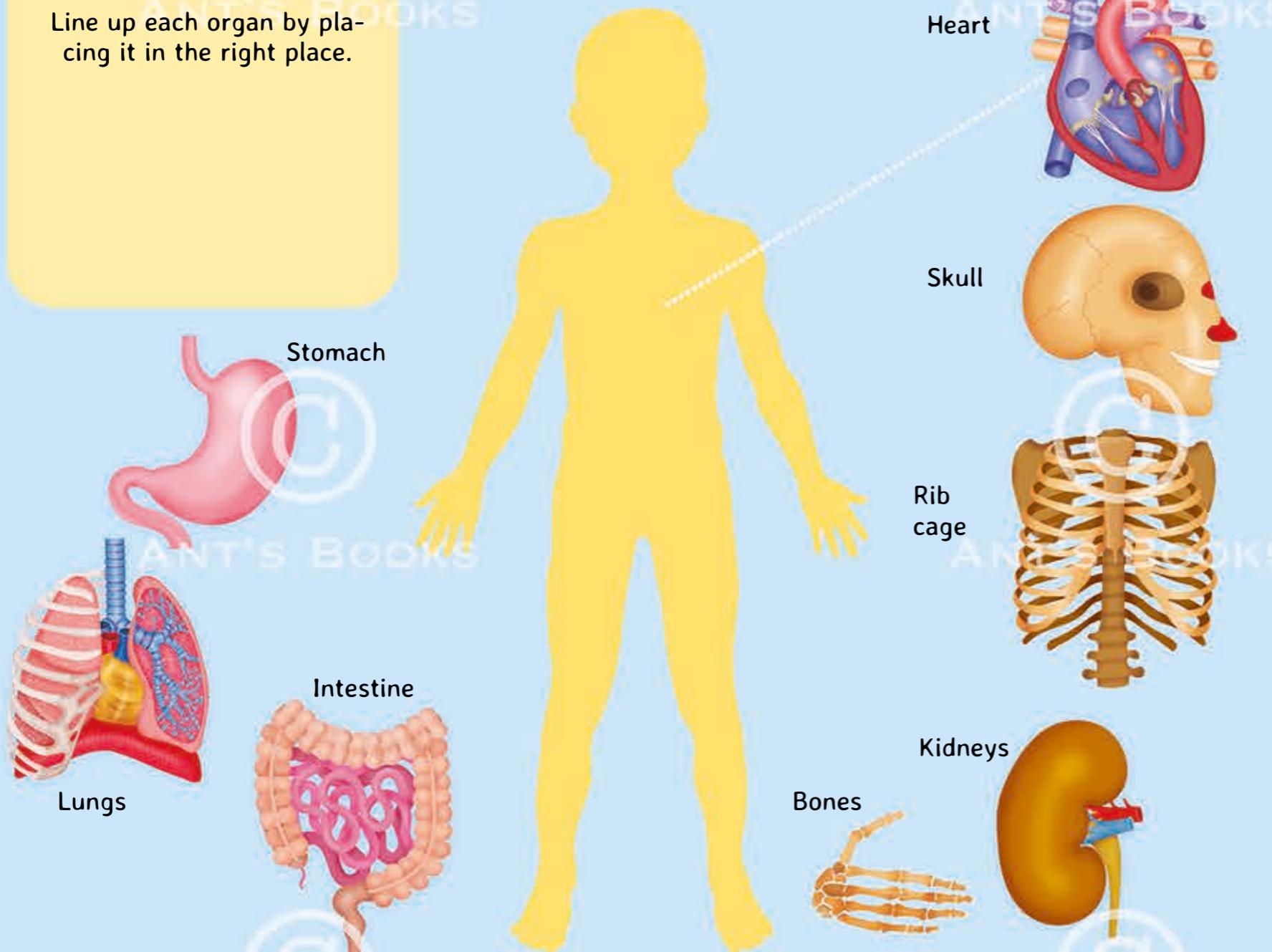
Which of these trays contains a healthy and correct menu for your diet?



Tray B

## EACH ORGAN IN ITS PLACE

Line up each organ by placing it in the right place.



Lungs

Intestine

Bones

Kidneys

Rib cage

Skull

Heart

Stomach

## BLOOD ANALYSIS

The doctor is doing the blood tests: will there be more blood cells or more viruses? Who will win?

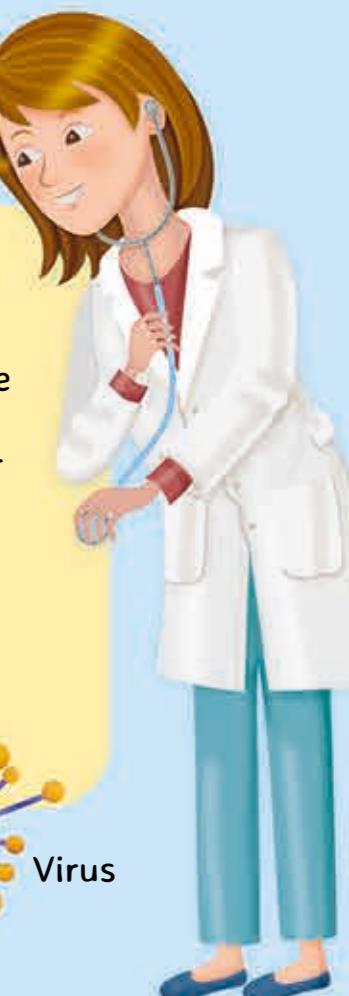
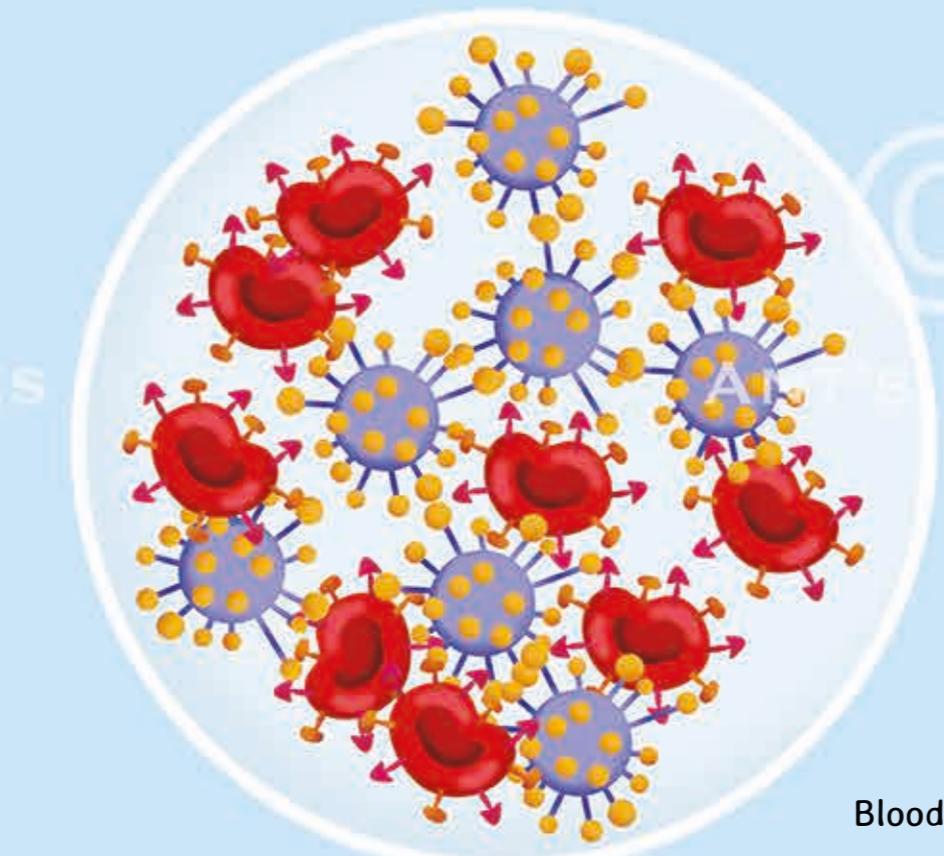
Blood cells

Virus



## SHARPEN YOUR SIGHT

Leo observes some cells under the microscope, help him recognize them: join the shape with the correct cell.



# THE WORDS OF THE BODY

## APPARATUS

Group of organs that work together to control the functioning of the human body.

## BACTERIA

Single-celled microorganisms which, in some cases, can cause disease in humans.

## CARTILAGE

Soft tissue that lines the ends of the bones in the joints.

## CELLS

Microscopic living units with different shapes depending on the function. Despite their small size, they have a very complex structure.

## BRAIN

It is the largest part of the brain. Together with the cerebellum and spinal cord, it controls much of the body's activities.

## HEART

Muscle about the size of a fist and located in the center of the chest. It works as a tireless pump that circulates blood throughout the body.

## DIAPHRAGM

Dome-shaped flat muscle that divides the chest from the abdomen. Its contractions promote breathing.

## LIVES

It is the largest internal organ in the body. It carries out complex chemical reactions to remove toxic substances from the blood and produce bile.

## PREGNANCY

Length of time the baby develops in the womb. It lasts about 40 weeks but already after 8 the fetus has taken shape and performs some movements.

## MUSCLES

In the human body there are more than 650 muscles, most of them are used to move the body, others help the functioning of internal organs.

## BONES

Bones form the support of the body and protect the delicate internal organs. They are composed of particular cells capable of absorbing mineral salts which make them resistant and elastic. Blood cells are formed inside them.

## OXYGEN

The cells of the body need to continuously receive oxygen. Thanks to this gas, introduced into the body through breathing, they transform sugars into energy.

## OVUM

It is the female reproductive cell that by meeting the male sperm can give rise to a new life.

## LEATHER

It is the coating that envelops the body, forming a protective barrier against the invasions of germs. Among its tasks are the protection from the sun's rays and the maintenance of body temperature.

## BLOOD

Red liquid composed of plasma, platelets, white and red blood cells. It is pumped by the heart to reach all the cells in the body and carry nutrients.

## IMMUNE SYSTEM

The human body has a formidable defense system that protects it from attacks by germs.

Thanks to the network of lymphatic vessels, the liquids coming from the cells are purified passing through the lymph nodes.

## STIRRUP, ANVIL AND HAMMER

The stirrup is the smallest bone in the human body. Together with the anvil and the hammer, it forms a chain of ossicles that connect the eardrum to the inner ear, transmitting vibrations.

## STOMACH

It is an organ that plays a fundamental role in digestion. Food arriving from the mouth stays inside for three to five hours to be mixed with gastric juices.

## TONSILS

In the throat are the first "sentinels" of our immune defense system: they are small organs called tonsils capable of filtering and destroying bacteria and viruses.

## VIRUS

They are among the smallest germs capable of infecting our body with diseases such as colds or the flu. Our immune system manages to neutralize and eliminate them.



# ANT'S BOOKS

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# ANT'S BOOKS



