

3.1 Homeostasis



Word search

Find the keywords about anatomy and physiology from the table below in the word search.

H	M	T	T	G	D	N	R	W	G	L	E	W	Z	M
Y	H	P	U	Z	F	M	M	C	O	L	R	J	U	I
L	R	D	B	A	C	L	M	Z	X	D	G	S	L	M
Y	R	O	T	A	R	I	P	S	E	R	C	Y	K	M
M	N	C	T	S	N	J	V	V	O	U	I	G	O	U
T	G	E	R	A	F	D	I	Q	L	K	N	O	R	N
R	R	Z	R	S	L	T	R	O	N	J	I	L	T	E
N	L	U	N	V	S	U	S	F	S	F	U	O	C	J
Q	U	L	N	E	O	K	C	C	S	W	W	I	F	C
T	I	Y	G	G	E	U	D	R	R	Q	C	S	Z	G
P	G	I	S	L	R	R	S	D	I	Y	Q	Y	F	V
E	D	E	E	B	U	Y	F	C	N	C	M	H	R	T
T	J	T	A	N	A	T	O	M	Y	I	Y	P	U	Q
V	A	G	A	W	R	G	T	Y	X	E	H	S	S	U
L	J	W	K	Q	O	K	N	F	G	C	J	X	P	F

ANATOMY	PHYSIOLOGY	DIGESTIVE	CORD
NERVOUS	RESPIRATORY	IMMUNE	NERVES



Discussion: Anatomy and physiology

Have you heard the words anatomy or physiology before? What do you think they mean? Discuss this with your class, then answer the questions below.

What does anatomy mean?

is the scientific study of the structure of living things

What does physiology mean?

is the study of how these structures work



Activity 1 The systems of the human body

The human body is made up of different systems. List the six major systems below.

1. The nervous system
2. The digestive system
3. The immune system
4. The musculoskeletal system
5. The circulatory system
6. The respiratory system

3.1 Homeostasis



Activity 2

Homeostasis

In the space below write a definition of homeostasis.

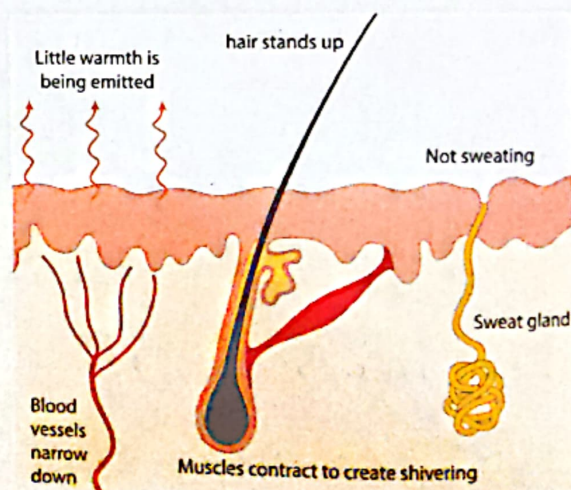
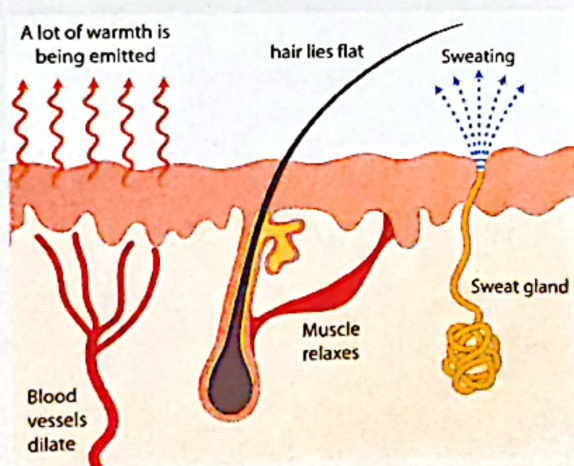
Homeostasis is ~~keeping~~ the process of controlling our body's internal environment no matter what happens in the external environment.



Activity 3

Thermoregulation

Look at the following images and decide if which one shows homeostasis when the body is hot and which one shows homeostasis when the body is cold.



The body is Hot

The body is cold

Activity 4

What does homeostasis control?

Tick three things that homeostasis controls in the body.

Movement	
Body temperature	/
Eye colour	
Blood glucose levels	/
Water content	/

Activity 5

What controls homeostasis?

Answer the questions about homeostasis.

What part of the body controls homeostasis?

A part of the brain called "Hypothalamus"

Where in the body can you find this part?

In the brain

3.2 Human tissue

STARTER

Types of tissue

In the circles below, write the names of four types of human tissue.

Muscle
Tissue

Connective
Tissue

Nervous
Tissue

Epithelial
Tissue

Notes:

Activity 6

Match the muscle tissue

Match each type of muscle tissue to a description.

Skeletal muscle

These muscles are found inside the organs.

Cardiac muscle

These muscles make up the walls of the heart.

Smooth muscle

These muscles are attached to the bones.

Activity 7

Fill in the blanks

Fill in the blanks about epithelial tissue using the words below.

barrier

cells

protects

skin

vessels

Epithelial tissues contain cells that line the outer surfaces of organs and blood vessels in the body. They also cover the inner surfaces of internal organs. An example of epithelial tissue is skin Epithelial tissue is important because it forms a barrier between the body and the external environment. It is also important because it protects the organs and helps them with filtration and absorption.

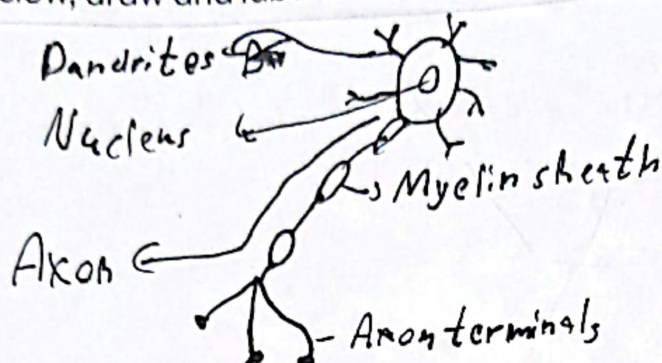
3.2 Human tissue



Activity 8

Nervous tissue

In the space below, draw and label a neurone.



Activity 9

Connective tissue

Work in pairs. Answer the questions about connective tissue.

1. What is connective tissue?

A strong material that connects the parts of the body.

2. Where can you find connective tissue in the body?

In different physical structures including:
Muscles, bones, tendons.

3. What does connective tissue do?

it connects different organs and parts of the body together. it also support and protects the body.

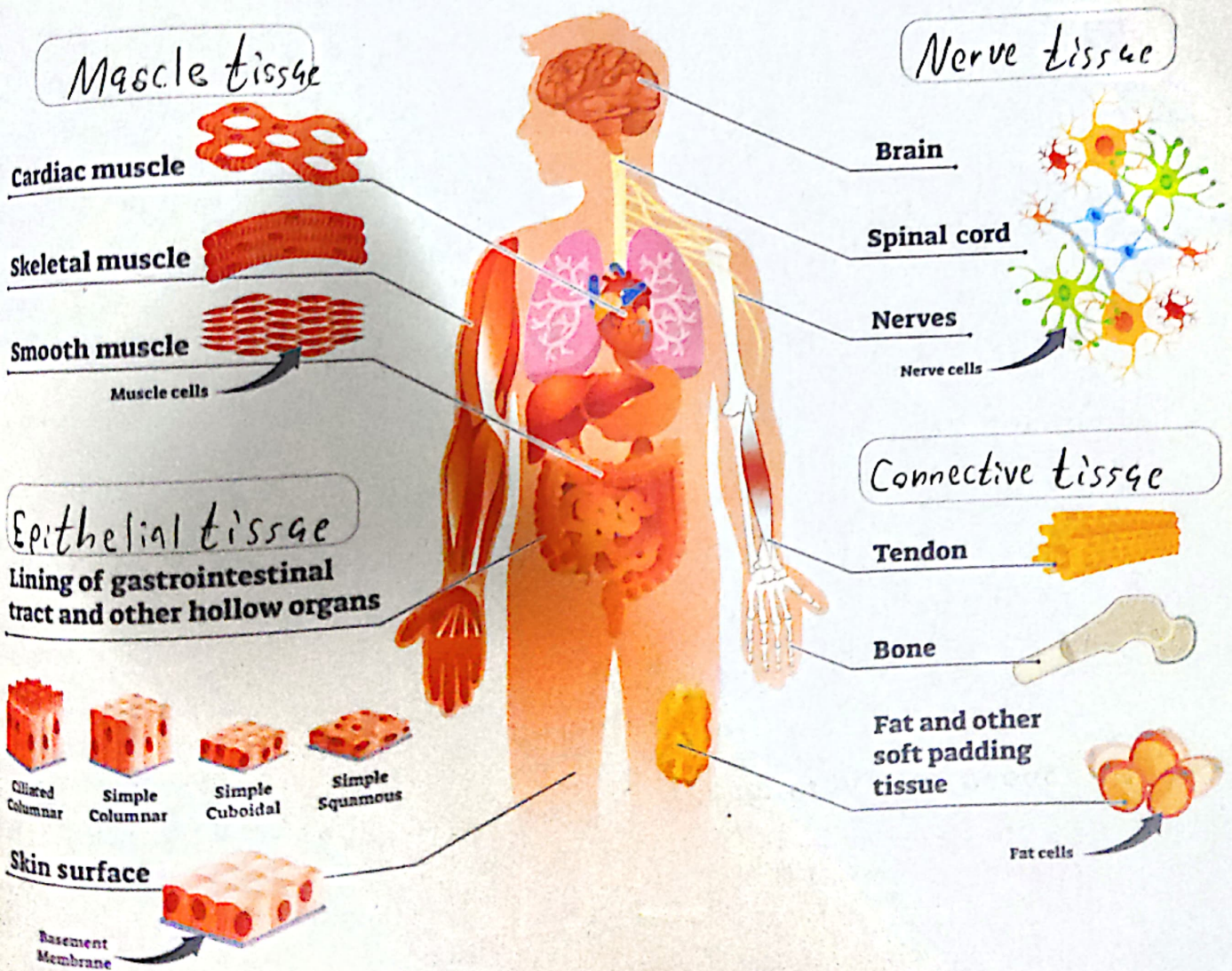
4. Name two physical structures made from connective tissue.

Tendon

bone

Look at the image below. Write the four tissue types in the empty boxes.

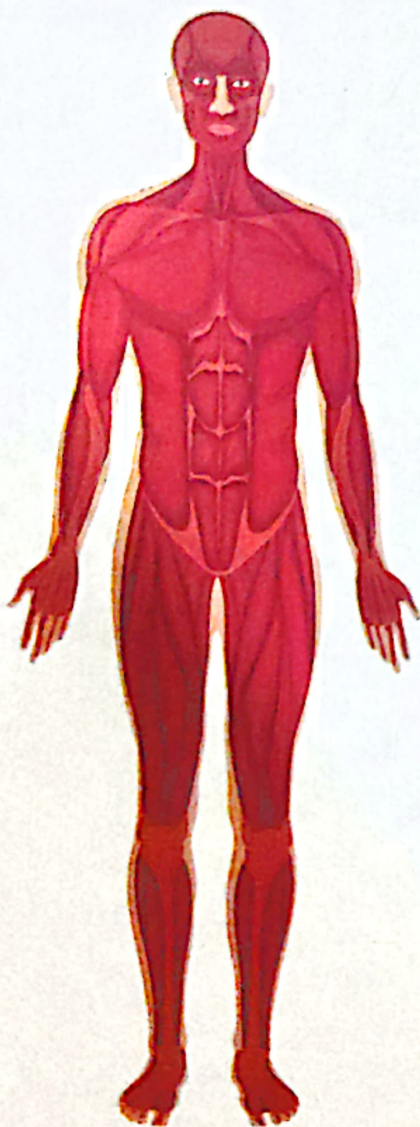
TYPES OF TISSUES



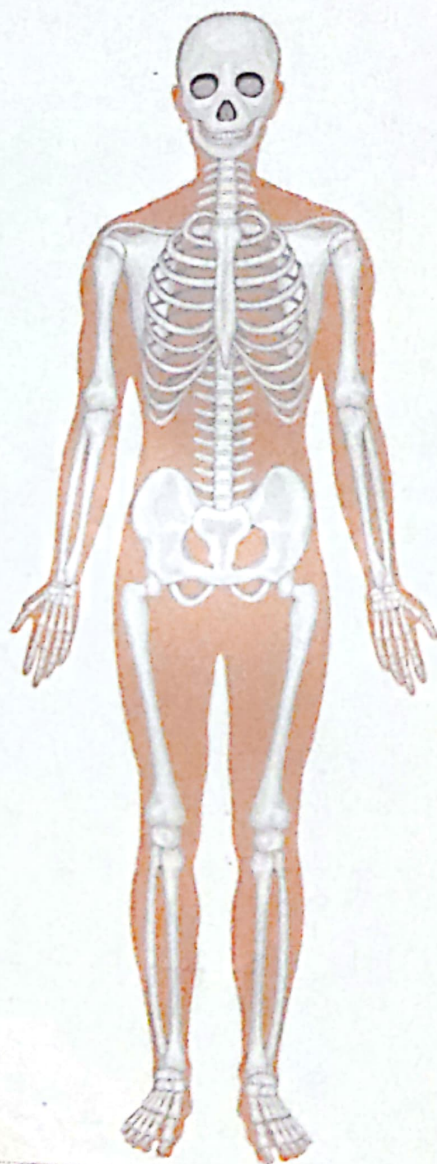
3.3 The musculoskeletal system

STARTER Name the systems

Look at the two body systems. Write the name of each system in the boxes below.



The muscular system



The skeletal system

What is the combination of these two body systems called?

The musculoskeletal system

Activity 11

Types of muscle

Think back to the last lesson where you learned about the types of muscle. Write the three types of muscle below.

1. Skeletal muscle

2. Smooth muscle

3. Cardiac muscle

Activity 12

Naming muscles

In groups, name as many muscles as you can think of in the body. Your teacher will set a time limit and check which group has named the most muscles when time is up.

Biceps

Triceps

Quadriceps

Calfs

Abdominals

Hamstrings

3.3 The musculoskeletal system

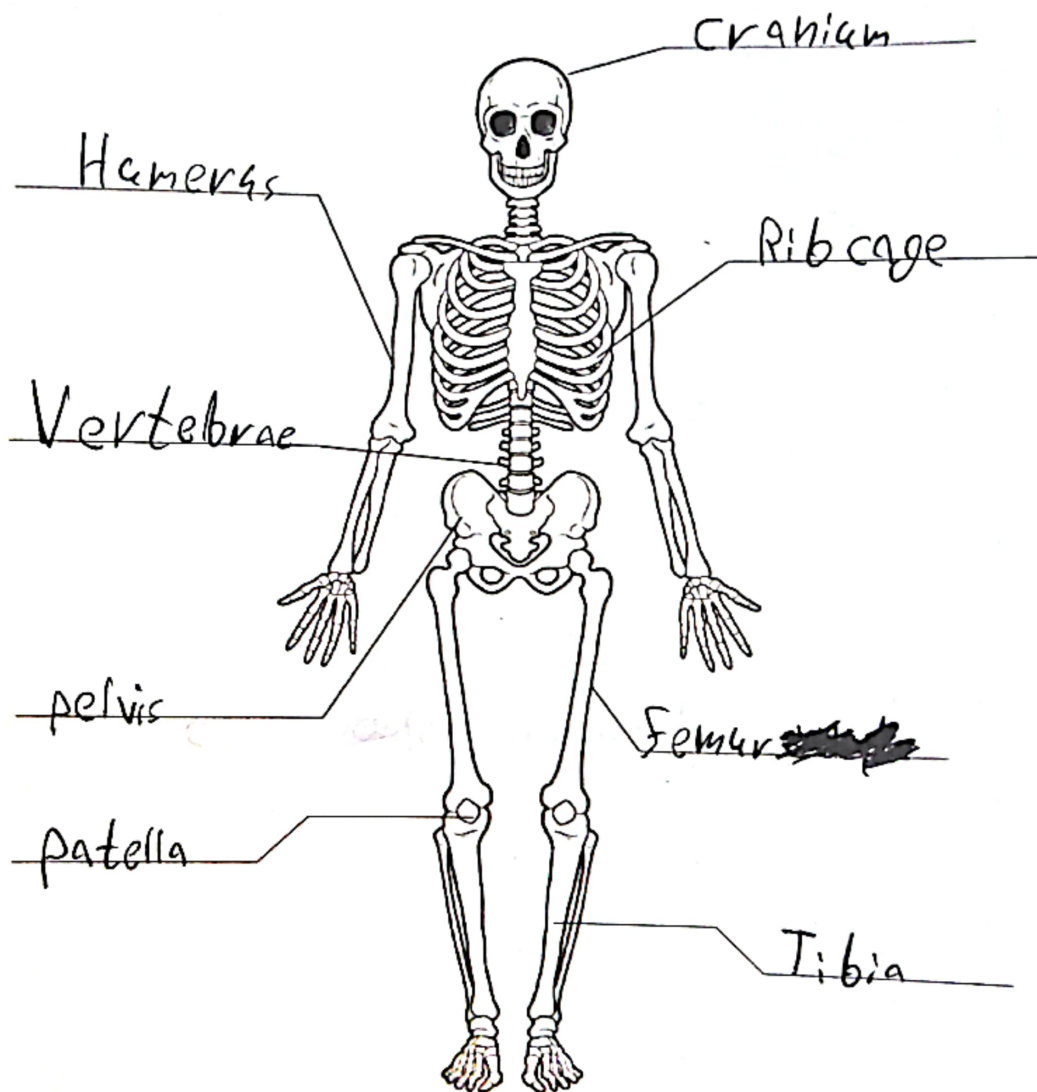


Activity 15

Label the skeleton

Label the bones on the skeleton below.

Patella	Femur	Humerus	Cranium
Rib cage	Vertebrae	Tibia	Pelvis



Research: More bones

Research other bones in the body that are not labelled in the image above or in your textbook. On the image above, label the bones you find in the correct place.

Activity 14

Joints, tendons, ligaments and cartilage

What does each of the following structures do? Choose the correct description for each part of the body system.

Joints	Connect bones together
	Long, hard structures
Tendons and ligaments	Found inside the bones
	Connect muscles to bones
Cartilage	Prevents bone ends from rubbing against each other
	Is made of cardiac muscle



Research: Longest and shortest bones

Do you know the names of the longest and shortest bones of the body? If not, research the names of these bones and write down where in the body they can be found.

The longest bone in the body is....	Femur
It can be found in...	The Thigh
The shortest bone in the body is...	Stapes bone (الركاب)
It can be found in...	The middle ear

3.4 The circulatory system



Discussion: The circulatory system

What do you already know about the circulatory system? Do you know the parts of the body are in this system? Discuss this with your class and answer the questions below.

What is the circulatory system?

It is a system of organs that includes the heart and blood vessels which is circulated throughout the entire body.

What parts of the body are in the circulatory system?

Blood vessels

The heart

Blood

What does the circulatory system do?

Transport oxygen, nutrients and hormones to your body's cells ~~and~~ organs and tissues.



**Video: The heart**

Watch the video showing the anatomy and physiology of the heart and answer the following questions.

1. How many times does the heart beat per day?

100,000 times

2. Where does the right side of the heart pump blood to? Circle your answer.

The lungs / The brain / The hands

3. What type of blood enters the left side of the heart?

Oxygenated blood

4. Where does the left side of the heart pump blood to? Circle your answer.

The brain / The body / The lungs

Notes from the video:

3.4 The circulatory system

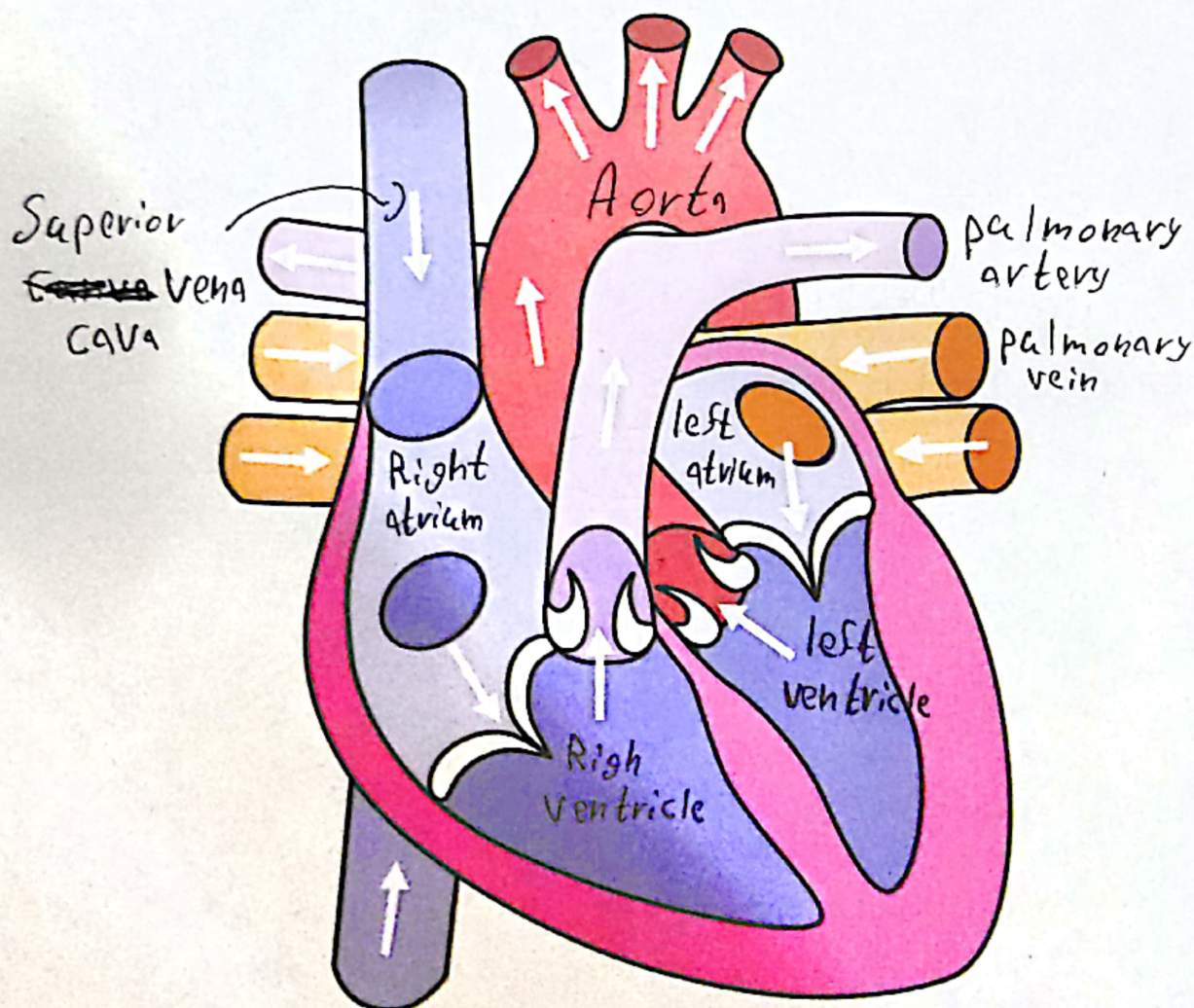


Activity 16

Label the heart

In the diagram of the heart below, label the following anatomical parts.

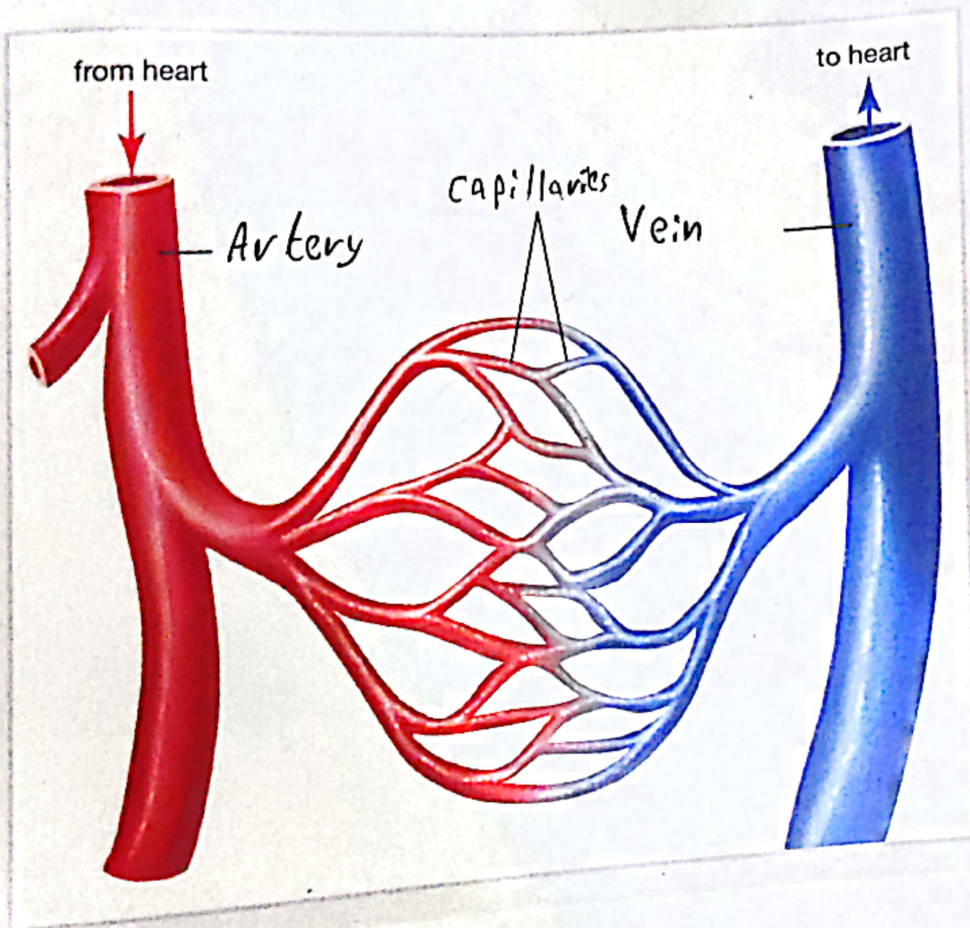
Aorta	~~Pulmonary vein~~	Superior vena cava	~~Pulmonary artery~~
~~Left atrium~~	~~Left ventricle~~	~~Right atrium~~	~~Right ventricle~~



Activity 17

Blood vessels

Use your knowledge from Unit 2 First Aid to help you with this activity.
Label the artery, vein and capillaries in the image below.



Notes:

3.4 The circulatory system



Activity 18

Blood vessels

Match the blood vessel with the correct function.

Artery	Carry deoxygenated blood back to the heart from the body.
Vein	Transfer nutrients from blood to organs and tissues.
Capillary	Carry oxygenated blood from the heart around the body.

(Note: The diagram shows handwritten lines crossing the connections. Arteries connect to 'Transfer nutrients...', Veins connect to 'Carry deoxygenated blood...', and Capillaries connect to 'Carry oxygenated blood...')



Activity 19

True or false

Answer true or false to the following statements.

	True	False
There are four valves in the heart.	/	
The heart pumps blood by contracting and relaxing the cardiac muscles.	/	
The sinus node creates an electrical impulse in the heart.	/	
There are six chambers in the heart.		/
The valves of the heart are always open.		/
The chambers of the heart are called the ventricles and the atria.	/	

Complete the following diagram to explain how circulation works.

oxygenated	right	oxygen	arteries
lungs	aorta		left

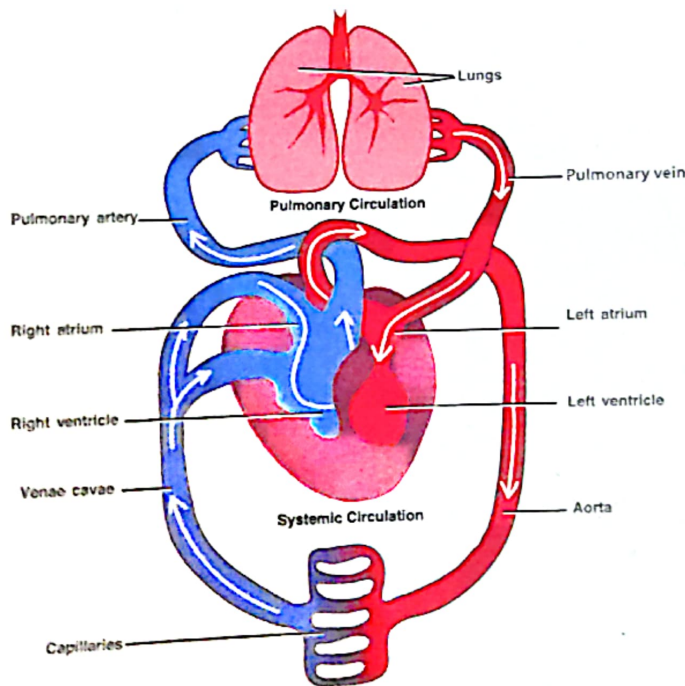
Lungs provide the blood with ..oxygen and blood provides the lungs with carbon dioxide.

Oxygenated blood from the lungs is sent to the ...left... side of the heart through the pulmonary vein.

Oxygenated blood in the left side of the heart is pumped to the body by the aorta and this blood is transported to the body by arteries and capillaries.

Deoxygenated blood in the right side of the heart is pumped to the ...lungs by the pulmonary artery to collect oxygen.

Deoxygenated blood from the body is sent to the ...right side of the heart through the vena cava.



3.5 The respiratory system

STARTER Breathing

Fill in the blanks about what you know about breathing using the words in the table.

air	oxygen	survive
lungs	nose	carbon dioxide

When we breathe, we take in*oxygen*..... and breathe out ..*Carbon dioxide*.....

When we breathe, the air enters our*lungs*.....

Oxygen is found in the*air*..... around us.

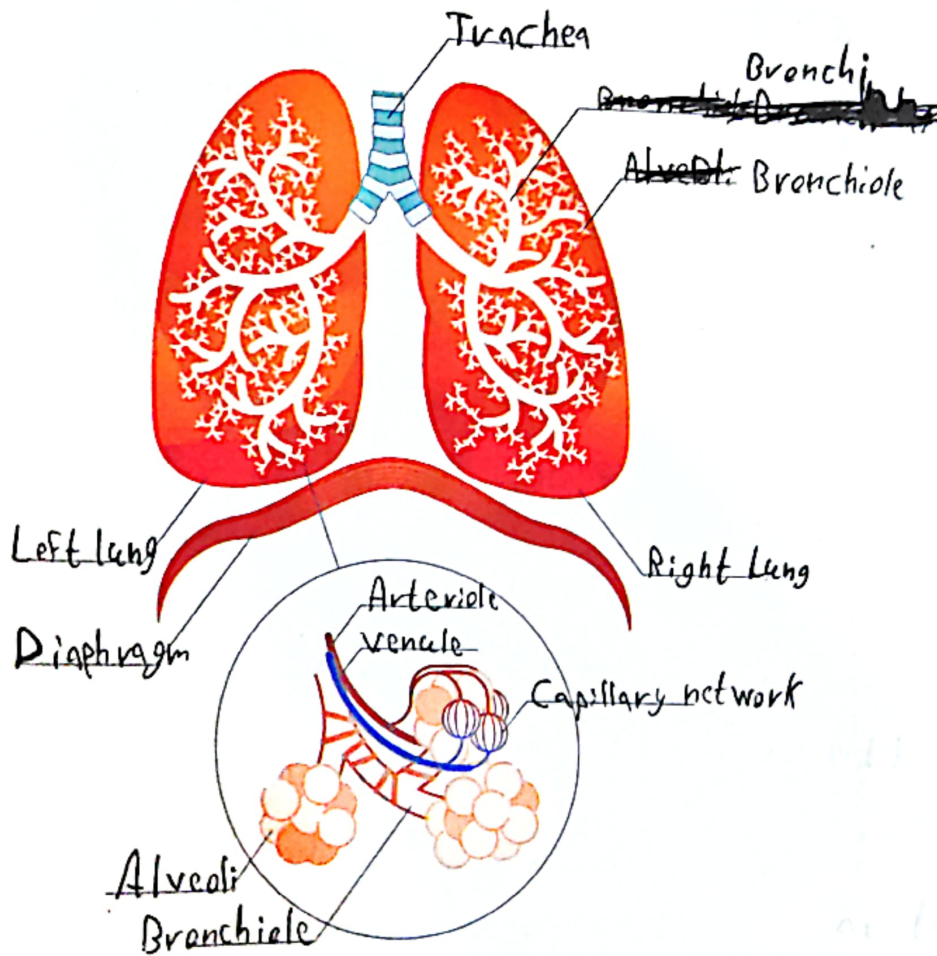
We need to breathe in order to*Survive*.....

We breathe in through the*nose*..... and out through the mouth.



Label the respiratory system

Label each part of the respiratory system below. You may need to do some extra research or think back to previous lessons in this unit to help you with your answers. Use the words in the table below to complete this activity.



Alveoli	Bronchiote	Bronehiote
Bronchi	Trachea	Left lung
Diaphragm	Right lung	Arteriole
Venule	Capillary network	

3.5 The respiratory system



Activity 32

Respiration

Complete the flow charts below which describe how inhalation and exhalation work.

In each box on the left, there is one aspect of respiration, explain what happens to this aspect during inhalation and exhalation. An example has been done for you.

Feature	Inhalation	Exhalation
Diaphragm	moves down	moves upwards
Intercostal muscles	smaller	relax
Ribs	move up and out	contract
Air pressure	Decreases	Increases
Lungs	Air in	Air out



Activity 33

Gas exchange

Explain what happens in gas exchange in the space below.

Gas exchange in the lungs involves the transfer of oxygen from the air to the bloodstream via alveoli and the removal of stored CO_2

Activity 24

Balloon lung

This activity will help you to understand how the lungs work. You will need the following pieces of equipment:

- ⊙ 2 balloons; 1 whole balloon, 1 with the end cut off
- ⊙ 1 elastic band or some sticky tape
- ⊙ 1 x 2-litre plastic bottle with the bottom end cut off



Steps

- 1) Push the whole balloon into the top of the bottle; fold the top of it around the neck of the bottle.
- 2) Cut the neck off the other balloon. Stretch the cut-off balloon over the open end at the bottom of the bottle. This will stop air entering or leaving the bottle. Secure it with tape or a rubber band.
- 3) Pull on the middle of the balloon at the bottom of the bottle. What happens to the balloon inside the bottle?
- 4) Let go of the balloon at the bottom of the bottle; then, push it into the bottle gently. What happens to the balloon inside the bottle?

Make some notes about what you see happening to the balloon.

step 1) it represents the lungs at rest, with the diaphragm in a relaxed position.

step 2) The contraction of the diaphragm and the expansion of the lungs during inhalation.

Step 3 shows what happens inside your body when the lungs expand, and the diaphragm moves down.

Step 4 shows what happens when the lungs contract and the diaphragm moves up.

3.6 The nervous system



Discussion: The nervous system

What do you know about the nervous system? Do you know what it does? Discuss in groups and make notes below.

The nervous system is like the body's communication network. It's made of two main parts:

- (CNS) 1) Central nervous system: which includes the brain and spinal cord
- (PNS) 2) Peripheral nervous system: this is like the network cables connecting your devices. It includes nerves that spread throughout your body. These nerves make you do everything you do.



Activity 25

True or false

Are the following statements about the nervous system true or false?

Statements	True	False
The brain and the spinal cord are part of the central nervous system.	✓	
The nervous system controls the body's actions.	✓	
The nervous system contains the bones and muscles.		✓
The peripheral nervous system is part of the nervous system.	✓	
The nervous system circulates blood around the body.		✓
The nervous system sends signals to and from parts of the body.	✓	

The PNS and CNS

The nervous system has two parts. Which parts of the body make up each one?

The peripheral nervous system:

Arms and Legs

The central nervous system:

The brain and the spinal cord

The spinal cord

Work in pairs to answer the following questions about the spinal cord.

1. Where can you find the spinal cord in the body?

~~In the head~~ From the brain stem to the bottom of the back
(Spine)

2. What kind of tissue does the spinal cord contain?

Nervous Tissues

3. What protects the spinal cord?

The Spine

3.6 The nervous system



Activity 20

Put the steps in order

Read each of the steps below which are describing the reflex when you touch something hot. Put the steps in the correct order.

- 4 Ⓞ Muscles of the arm and hand contract to move the hand away.
- 1 Ⓞ Skin receptors detect a change in temperature.
- 3 Ⓞ The brain sends signals to the motor neurones to tell the muscles how to react.
- 2 Ⓞ The sensory neurones send signals to the brain about the change in temperature.

Skin receptors detect a change in temperature.



The sensory neurones send signals to the brain about the change in temp.



The brain sends signals to the motor neurones to tell the muscles how to react.



Muscles of the arm and hand contract to move the hand away.



Activity 21

Motor neurones and sensory neurones

Explain the difference between motor neurones and sensory neurones.

Sensory neurones gather information from your senses and send it to the (CNS). In contrast, motor neurones send the message from the (CNS) to the muscles and glands so they can react in the correct way.

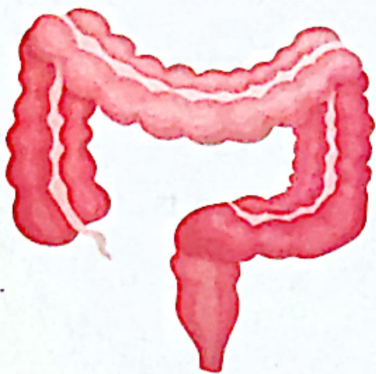
3.7 The digestive system

STARTER What are they?

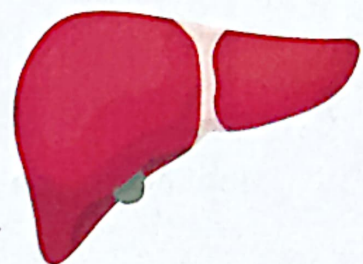
Do you recognise the anatomy of the digestive system? Label each image with the correct name using the words in the table.

small intestine	pancreas	liver
mouth	large intestine	stomach

Large intestine



liver



pancreas



Mouth



Stomach



Small intestine



Activity 30

Digestion

Put the steps of digestion into the correct order. The first one has been done for you.

	Number
The digestion process starts when food enters the mouth.	1
The small intestine breaks down the mixture so that the body can absorb all the vitamins, minerals, proteins, carbohydrates and fats.	4
In the stomach, the food is mixed with enzymes and acids that break it down into very small pieces.	3
The stools then pass to the rectum and finally on to the anus where they are passed out of the body.	6
When the food is swallowed, it travels through the oesophagus into the stomach.	2
In the large intestine, the water contained in the stools is removed.	5

Activity 31

Digestive organs

Circle the three organs in the digestive system that food does not travel through but are still very important for digestion.

The pancreas	The stomach	The mouth
The gall bladder	The liver	The large intestine

3.8 The Immune system

STARTER

Components of the immune system

Unscramble the words below. They are parts of the immune system.

1. hitwe oolbd lecsi

white blood cells

2. ymusth

thymus

3. yesPar apthcles

Peyer's patches

4. xidppear

appendix

5. silstno dna sdadenoi

tonsils and adenoids

6. enbo wrroam

bone marrow

7. leepsn

spleen

8. phlym sendo

lymph nodes

Notes:

Activity 52

White blood cells

Work in groups to answer the following questions about white blood cells.

1. What do white blood cells protect the body from?

Infectious diseases - Bacteria - Foreign bodies

2. Name two types of white blood cells.

Lymphocytes

Phagocytes

T-cells B-cells

3. Where does the body make white blood cells?

In the bone marrow

Activity 53

Anatomy of the immune system

Look at the list of body parts below. Are they part of the immune system? Write yes or no.

	Yes or no?
Lymph nodes	Yes
Cardiac muscles	No
Spleen	Yes
Bone marrow	Yes
Joints	No
Thymus	Yes
Lungs	No

3.8 The Immune system



Activity 34

Physiology of the white blood cells

Draw a diagram below to show how white blood cells destroy foreign bodies.



Activity 35

Immunity

What kind of immunity is described in the boxes below? Write your answer in the space provided.

This type of immunity develops throughout your lifetime.

Adaptive Immunity

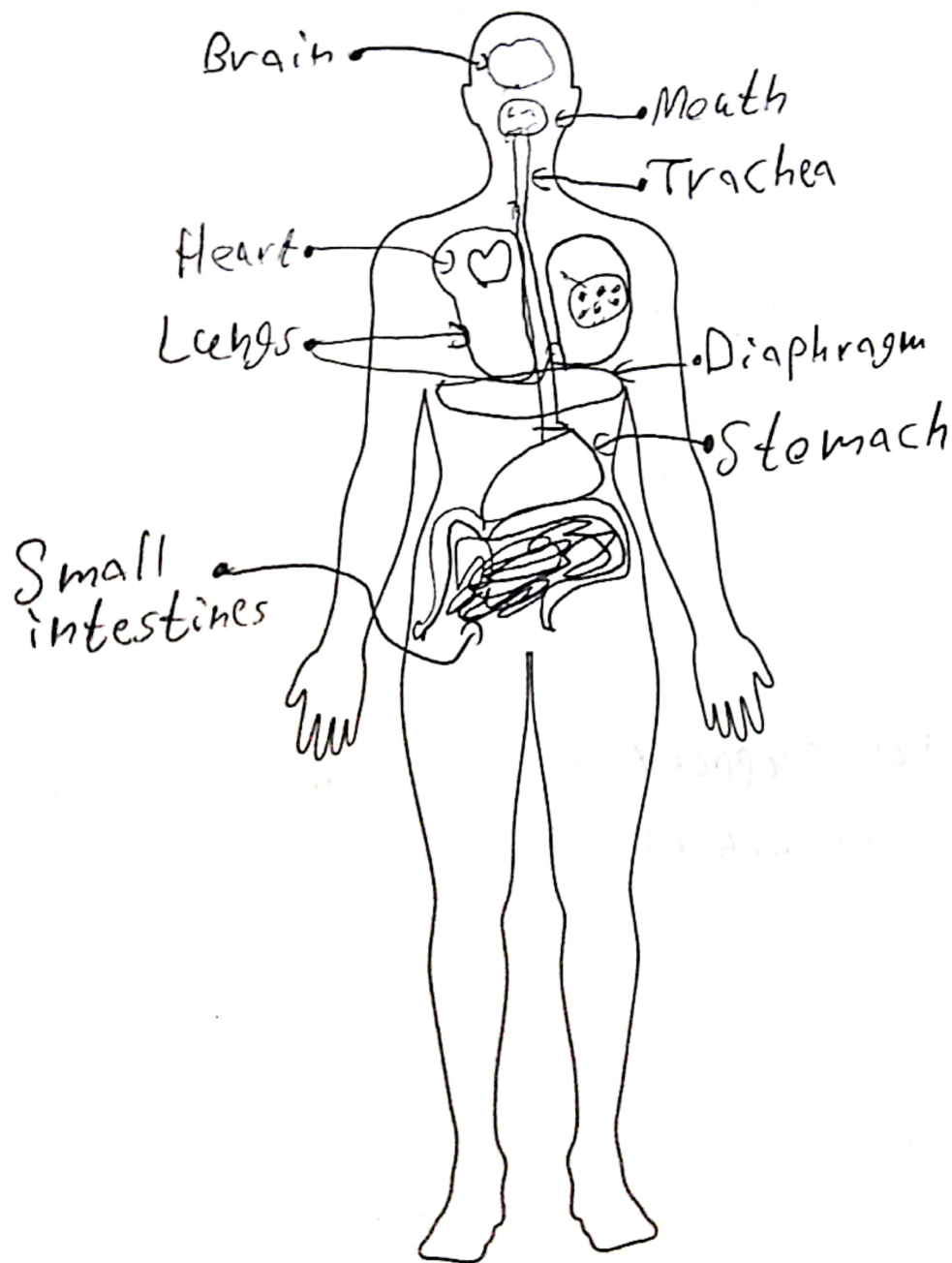
This type of immunity is 'borrowed' and only lasts a short time.

Passive Immunity

Everybody is born with this type of immunity.

Innate Immunity

The table below contains various body parts you have learned about in the last number of lessons. Draw a picture of each one onto the body and label it.



heart	~~small intestines~~	brain	~~stomach~~
trachea	lungs	mouth	~~diaphragm~~

End of unit quiz

1. Anatomy means the scientific study of the structure of living things.
True or false?

True

2. Physiology is the study of how plants grow.
True or false?

False

3. What does homeostasis mean?

The process of controlling the body's internal environment no matter what happens in the external environment.

4. Write one sentence about the function of each of the body systems.

Musculoskeletal system function:

Provides support and allows the body to move through the coordination of muscles and bones.

Circulatory system function:

Transports oxygen, nutrients and hormones throughout the body while removing waste products.

Respiratory system function:

The exchange of O_2 and CO_2 , ensuring that all cells receive oxygen for energy production.

Nervous system function:

Controls body functions, processes sensory information and enables the body to communicate through neurones

Digestive system function:

Breaks down food, absorbs nutrients and eliminate waste, providing the body with essential nutrients.

Immune system function:

Defends the body against infections and diseases by identifying and neutralizing harmful pathogens

5. Name the two parts of the nervous system.

CNS: Central Nervous system

PNS: Peripheral Nervous system

6. Which body system do these organs belong to?

The heart... The circulatory system

The brain... The Nervous system

The stomach... The digestive system

The lungs... The respiratory system