GRADE 6; SCIENCE AND TECHNOLOGY NOTES

CBC RATIONALIZED WORK

Well-organized, simplified learning notes that provide clear, concise information in a logical sequence, making key concepts easily accessible and memorable, enhancing understanding and retention while fostering engagement and facilitating effective study.

By providing a clear focus on key ideas, these Mwalimu Consultancy Notes foster better retention and comprehension, making learning more accessible and enjoyable.

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SCIENCE AND TECHNOLOGY LESSON NOTES

LIVING THINGS

- The term living thing refers to things that are now or once were alive
- A **living thing** pertains to any organism or a life form that possesses or shows the characteristics of life or being alive

PLANTS

- Plants are living things.
- The grouping of plants together with common characteristics or features is called the classification of plants.

TYPES OF PLANTS

Identifying different types of plants

Pupil's activityPage 1

To observe the different types of plants

Pupil's activityPage 1

To identify different types of plants found in the locality

Pupil's activityPage 2-3

Types of plants found in the locality

1. **Trees**

- Are big plants
- They have single stem called trunk and many strong branches
- Examples of tress include mango, coconut and avocado trees

2. **Shrubs**

- Are shorter than tress
- They have many thin and woody stems
- Examples of shrubs include hibiscus, rose and cotton plants

3. **Shrubs**

- Are small plants with soft green stems
- Examples of herbs include mint and coriander

4. **Grass**

- Is short and has narrow leaves

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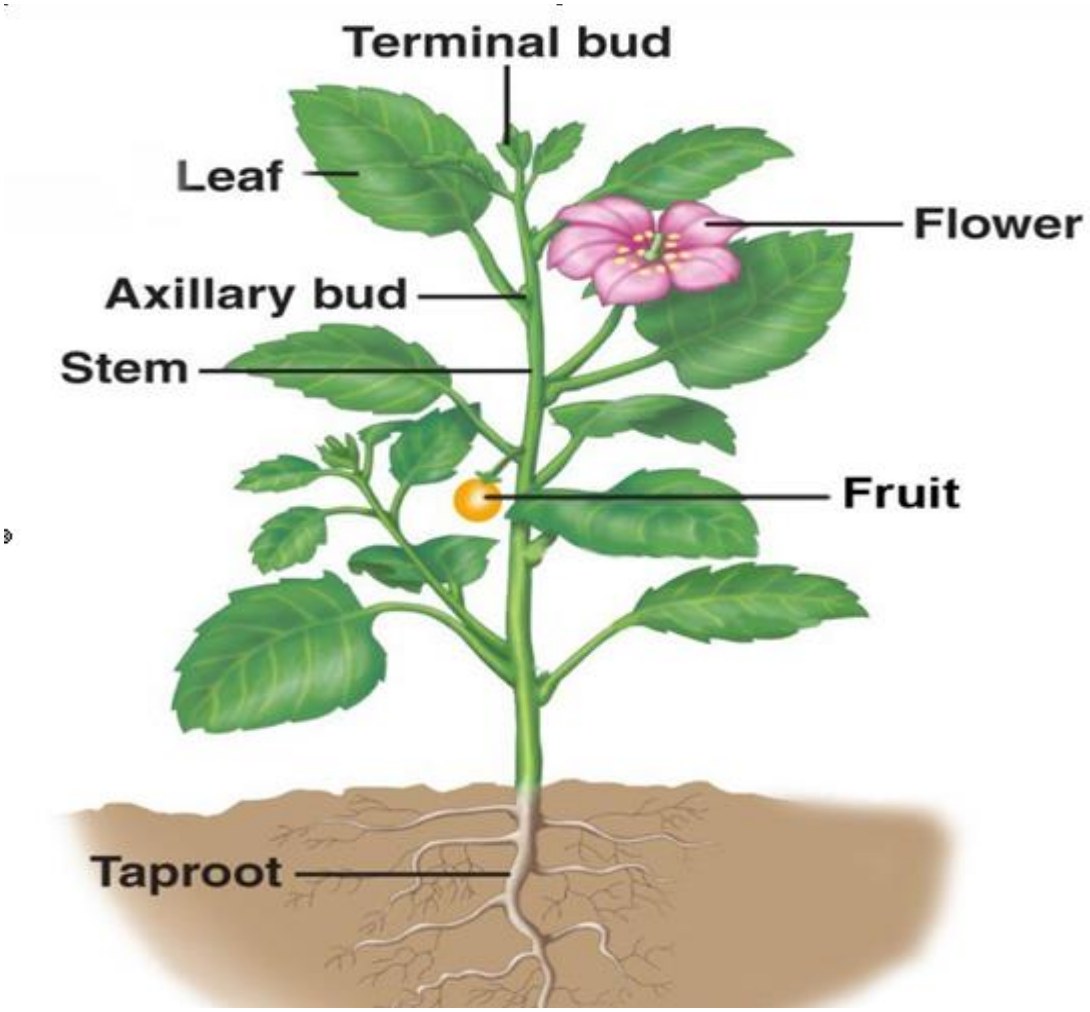
PARTS OF A PLANT

Identifying different parts of a plant



To name different parts of a plant

Pupil's activityPage 3

To identify different parts of plants growing in the environment

Pupil's activityPage 3-4

To draw different parts of a plant

Pupil's activityPage 5

- The external parts of a plant include

1. Roots
2. Stem
3. Leaves
4. Flowers
5. Fruits6.

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FUNCTIONS OF DIFFERENT PARTS OF A PLANT

To discuss the functions of different parts of a plantPupil's activity

Page 6

Part of a plant	Function
Leaves	
Stem	
Fruits	
Seeds	
Flowers	

Functions of the roots

1. **Support/hold/anchor the plant firmly in the soil**

The roots absorb water and mineral salts from soil through a process called absorptionPlants need water and mineral salts for proper growth

2. **Absorption of water and mineral salts**

The roots hold the plants firmly in the soil

This ensures that the plants are not carried away by water or wind

3. **Food storage**

Some plants such as arrowroots, cassava and carrots store food in the roots

Functions of the stem

Stem –

1. Transports water and mineral salts from the roots to the leavesCarries food made by the leaves to the roots for storage
2. Holds or supports the upper parts of the plant in good position
3. Protects the plant
4. Storage of water- some plants such as a cactus store water in the stem
5. Some stems store food and water for the plant

N.B. Plants that store food in the stem are called stem tubers. Examples of plants thatstore food in the stem are: a) Cactus b) Sugar cane c) Irish potato

To investigate the absorption and transport of water and mineral salts in a plant

Pupil's activityPage 7-8

Functions of the leaves

1. **Breathing** – Exchange of gases through small tiny holes called stomata.
2. **Manufacture of food**

Leaves make food for the plant using chlorophyll, sunlight, water and carbon (IV)oxide through a process called Photosynthesis – Process of making its own food Requirements of photosynthesis are:- Chlorophyll – green colouring matter WaterCarbon dioxide Sunlight

3. **Storage of food** – Edible vegetables such as kales, cabbages, spinach
4. **Removal of excess water through transpiration**

Transpiration – Process in which plants lose excess water through small holes calledstomata. Transpiration is high when it is hot, sunny, dry, windy. It is low when it's cold, wet, calm and rainy.

Function of flowers

- Flowers are the reproductive organs of plants
- They develop into fruits
- It bears fruits which contains seeds that germinate into a new plant Seeds germinateinto new young plants called seedlings

Function of fruits

1. Storage of food

Some plants like avocados, mangos and orange store food in fruits

2. Protecting seeds

In most plants, seeds are found inside fruitsThe fruits protect the seeds from drying

Functions of seeds

When seeds germinate, they grow into new plants

To investigate transpiration in plants

Pupil's activityPage 9

Making mounts of plants

Pupils activities Page10-11

TYPES OF ROOTS

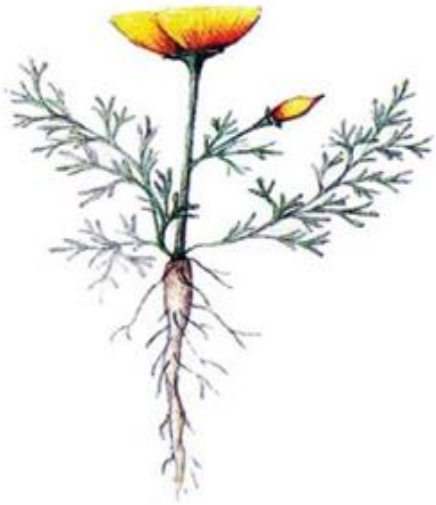
There are two main types of roots

1. Tap root - extension of stem with side roots
2. Fibrous roots-many similar roots

To observe taproots and fibrous roots

3. Pupil's activityPage 13
4. **To collect plants with different types of roots**
5. Pupil's activityPage 13
6.

Fibrous root



Tap root

Taproots	**Fibrous roots**
They consist of one main root that grows down into the soil They have lateral roots that arise from the main root	They do not have a main root All roots are similar and they arise from thesame place
They grow deep into the soil	They are shallow
They grow vertically downwards into soil	They grow horizontally in all directions
Plants with tap roots include:- Legumes, Acacia, Fruit trees,	*Plants with fibrous roots include:-* Cereals, Oats, Grass,Sisal, Onions, Sugarcane, Coconuts

Grouping plants based on the type of roots they have

Pupil's activityPage 16

Other types of roots

Other types of roots include:

a) Aerial roots – for breathing

b) Prop roots – used in maize for support

To mount different types of roots

Pupil's activityPage 17 -18

ANIMALS

Invertebrates

Categorizing invertebrates

Animals are classifiee into 2 main groups that is:-

1. Vertebrates.
2. Invertebrates.

Invertebrate

Are animals without backboneExamples

1. Bees
2. Flies
3. Grasshopper
4. Earthworm
5. Lobster
6. Snail
7. Millipeee
8. Fleas

Safety precautions to observe while handling invertebrates

Pupil's activityPage 22-23

1. Do not touch the invertebrates. Some can sting or produce substances thatcan irritate the skin
2. Do not kill the invertebrates
3. Do not destroy the areas where the invertebrates live
4. Do not remove the invertebrates from where they live5.

Identifying invertebrates found in the locality

Pupil's activityPage 23-24

To observe and identify invertebrates

Pupil's activityPage 23-24

Name of the invertebrate	Where it was found
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Characteristics of different invertebrates

To discuss the characteristics of invertebrates

Pupil's activityPage 25

Name of the invertebrate	Number of wings	Number of legs	Number of feelers	Number of eyes	How it moves
1.					
2.					
3.					
4.					
5.					

To observe the characteristics of invertebrates

Pupil's activityPage 2

Name of the insect	Number of body parts	Numberof wings	Number of legs	Number ofantenanna e	How it moves
1. Louse					
2. bees					
3. butterflies					
4. termites					
5. mosquito					

Characteristics of insects

1. Insects have 3 body parts 1. **Head**, 2. **Thorax**, 3. **Abdomen**
2. Insects have 3 pairs of legs
3. Most insects have 2 pairs of wings.They use the wing for flying

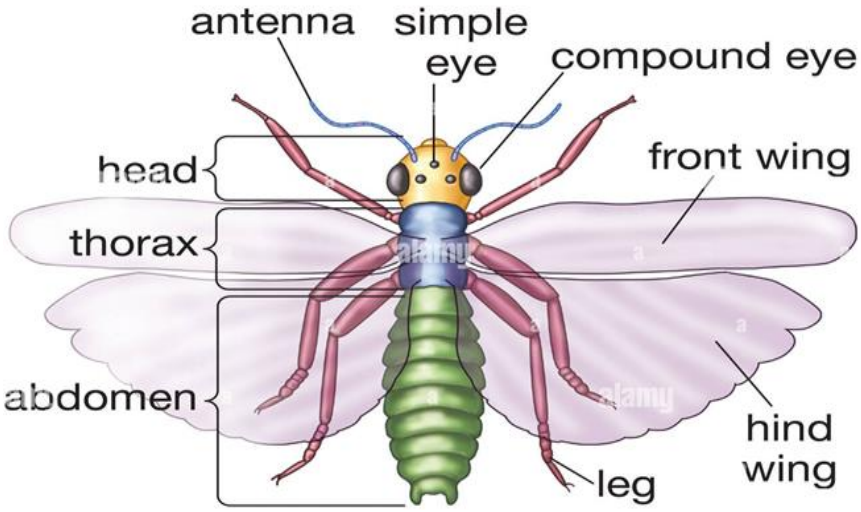
Some insects such as beetles and ants do not have wings

4. Insects have a pair of antennae on top of their heads.

Antennae are also known as **feelers**

Antennae are long, thin and are used for sensing.

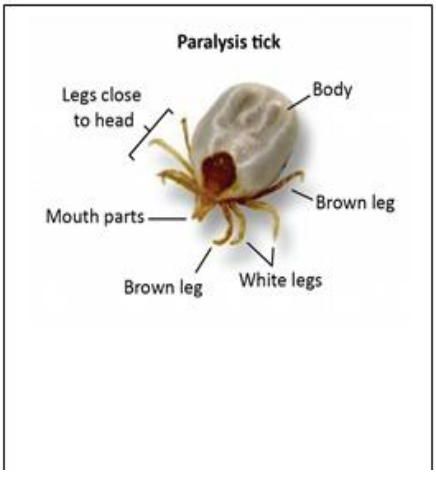
5. The body of an insect has a hard covering called **exoskeleton**

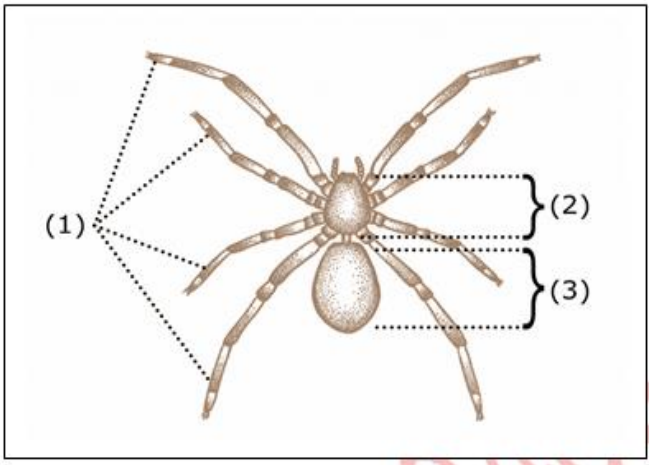


CHARACTERISTICS OF SPIDERS AND TICKS

To discuss the characteristics of spiders and tick

Pupil's activityPage 28-29



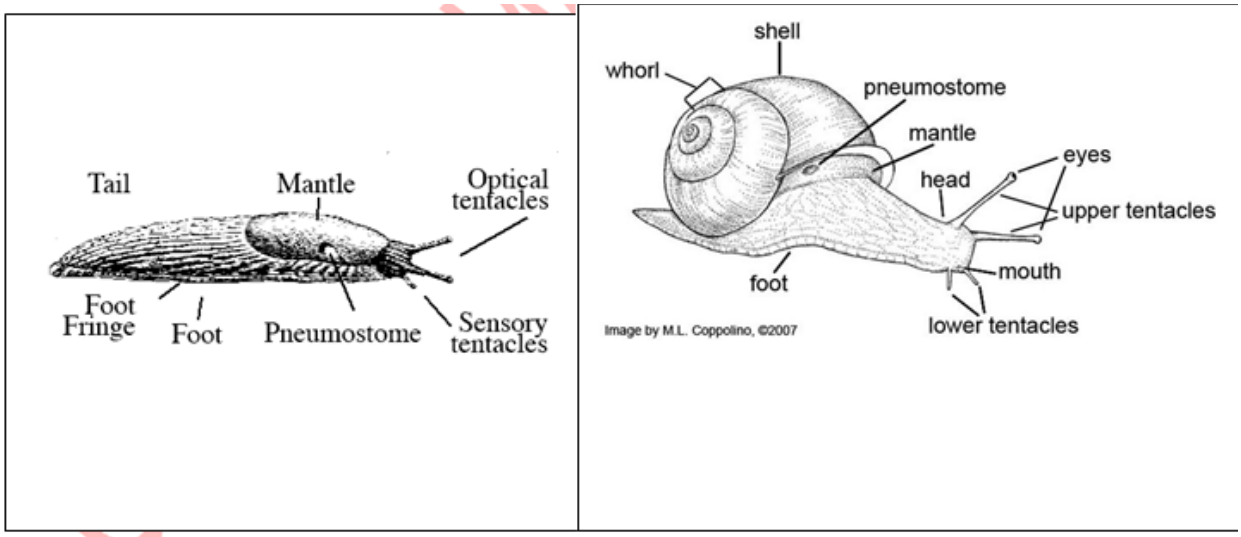


1. Spiders and ticks have 2 body parts
2. Spiders and ticks have 4 pairs of legs
3. Spiders and ticks do not have wings
4. Spiders and ticks do not have antennae

Characteristics of snails and slugs

To discuss characteristics of snails and slugs

Pupil's activityPage 29-30



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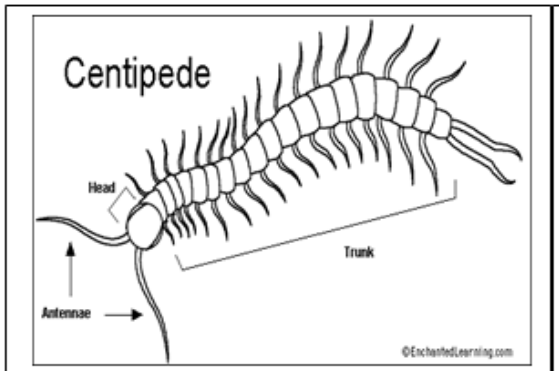
1. Snails and slugs have soft body
2. Snails and slugs do not have wings
3. Snails and slugs have 2 pairs of feelers on their heads.The feelers are also called **receptacles**
4. Snails and slays move by crawling on slimy mucus using the muscular footThe slimy mucus is produced by muscular foot

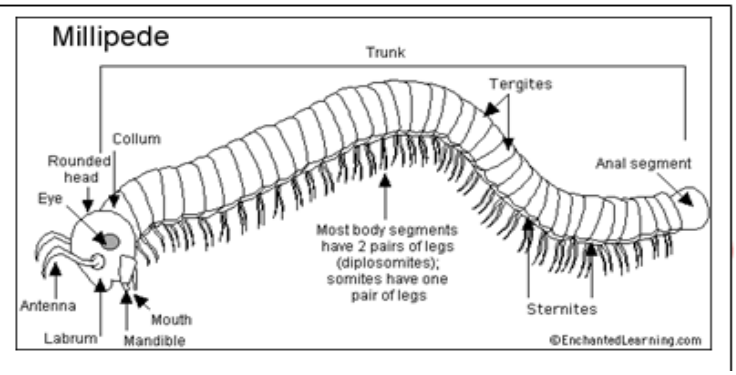
Snails have shells while slugs do not have shells.

CHARACTERISTICS OF CENTIPEDES AND MILLIPEDES

To discuss characteristics of centiiedes and milliiedes

Pupil's activityPage 30-31





1. **Centipedesandmillipedes aie2bodtysections-eadandiuns**
2. **T eiunsofboi millipedesandcentipedesisdiiideiniomiantysectionscalledsegment**
3. **Centipedesandmillipedes aiemiantypairsoflegs.**
- **Centipedes aieonepairoflegspersegmieni,onelegoneach sideofi ebodty.**
- Millipedes have two pairs of legs per segment.
- The legs are positioned under the body
- Millipedes coil body when disturbed

4. Centipedes have one pair of antennae on the head

Importance of invertebrates to human beings

1. Source of food

Some insects such as termites are used as food by some peopleBees produce honey which is used as food

2. Pollination

Most flowering plants are pollinated by insectsPollination enables to produce seeds

3. Cleaning the environment

Some invertebrates such as millipede feed on decaying matter turning it into compost.This helps

to clean up the environment

The compost makes soil good for growing crops

NB Some invertebrates are harmful to human beings

Making a photo album of invertebrates in the locality

Pupil's activityPage 32-33

HUMAN CIRCULATORY SYSTEM

- Blood circulates throughout the body in a system known as the **circulatory system**
- The **heart, blood** and the **blood vessel** make up the circulatory system
- The heart is a muscular organ that pumps blood to all parts of the body.Blood circulates around the body in blood vessels
- **Blood** is a body fluid that is used in the transportation of substances within the body.
- **Blood vessels** are tubes in which blood flows

  The main blood vessels are the **arteries, veins** and **capillaries**

Main Parts of Human Circulatory System

- The circulatory system is important because it is involved in the transport of thefollowing substances in the body.

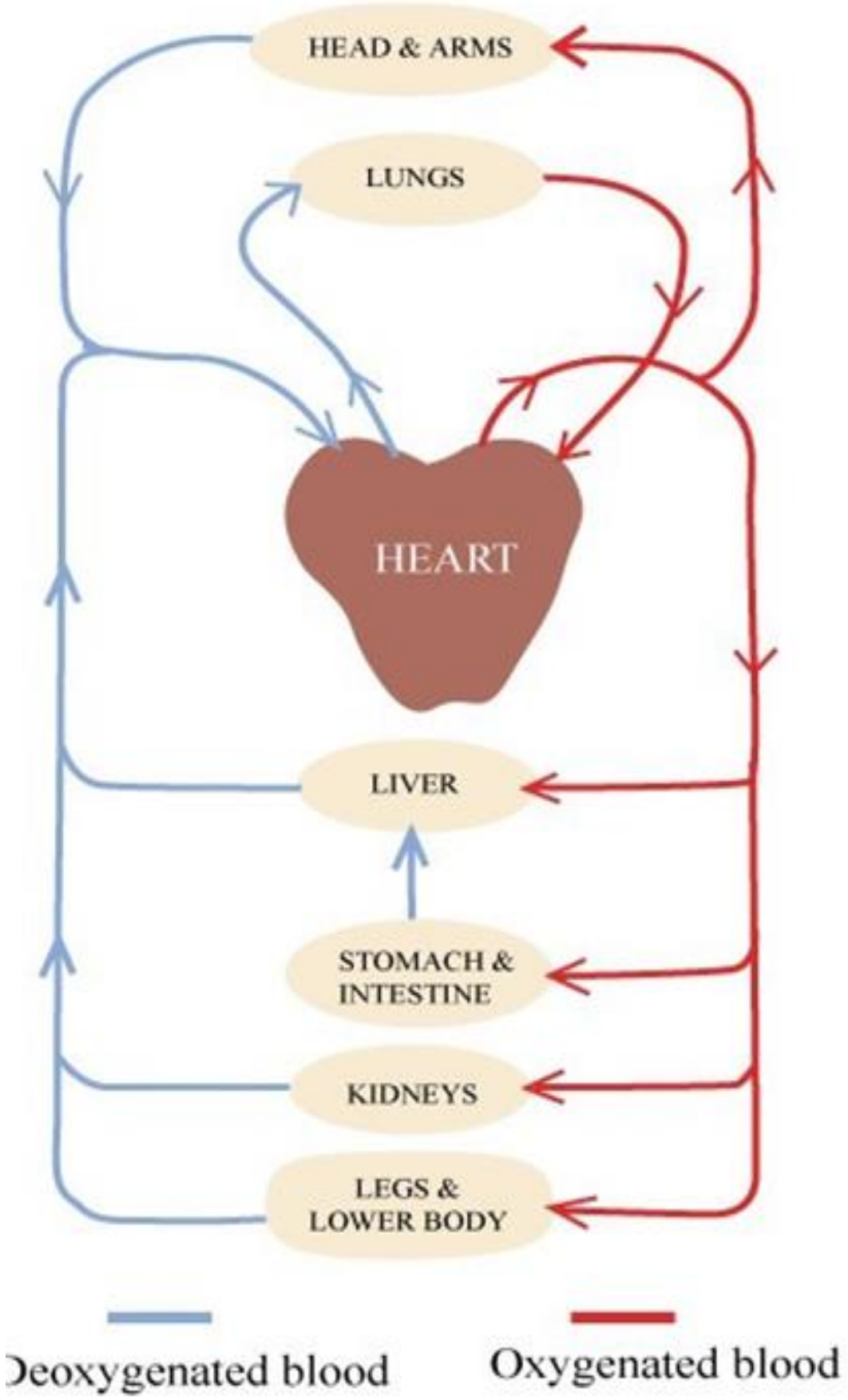
➢ **Oxygen** from the lungs to all parts of the body

➢ **Digested food** from the small intestines to all parts of the body

➢ **Carbon dioxide** from the body to the lungs where it is breathed out.

➢ **Heat** from the liver to all parts of the body. This helps to regulate bodytemperature

Waste products from different parts of the body to organs such as kidneys to beremoved from the body



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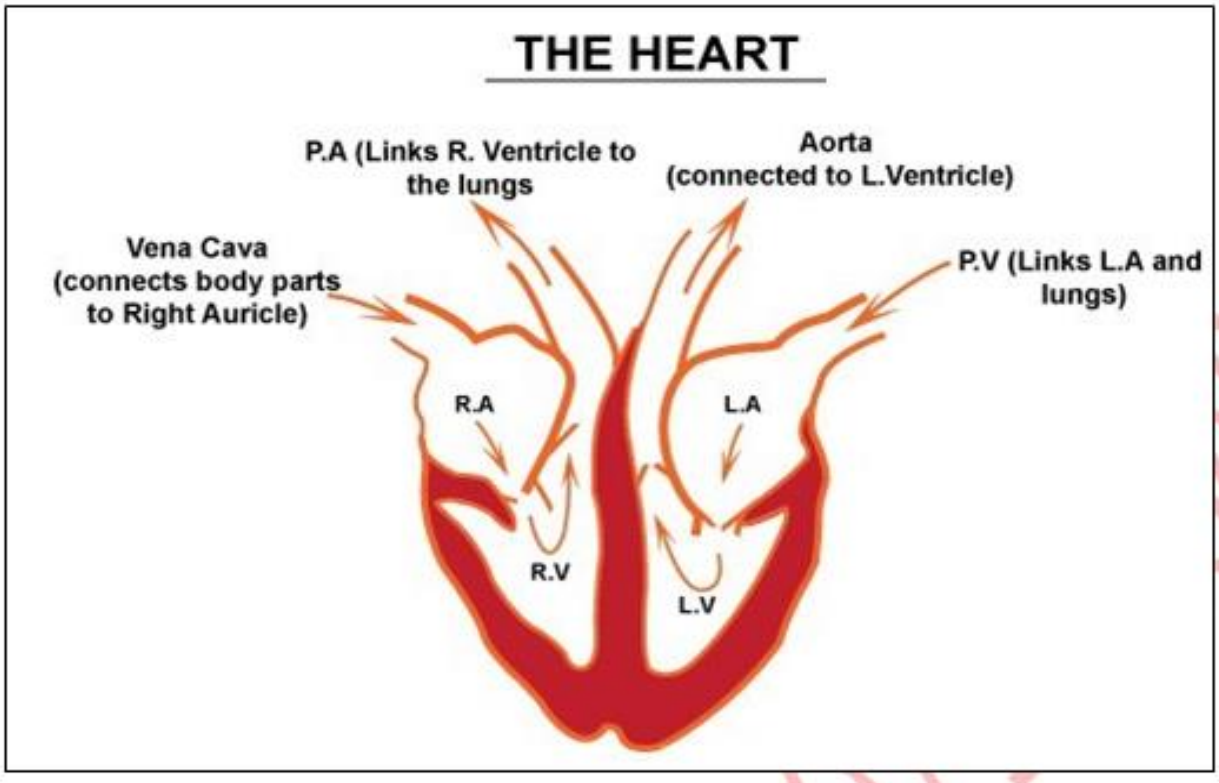
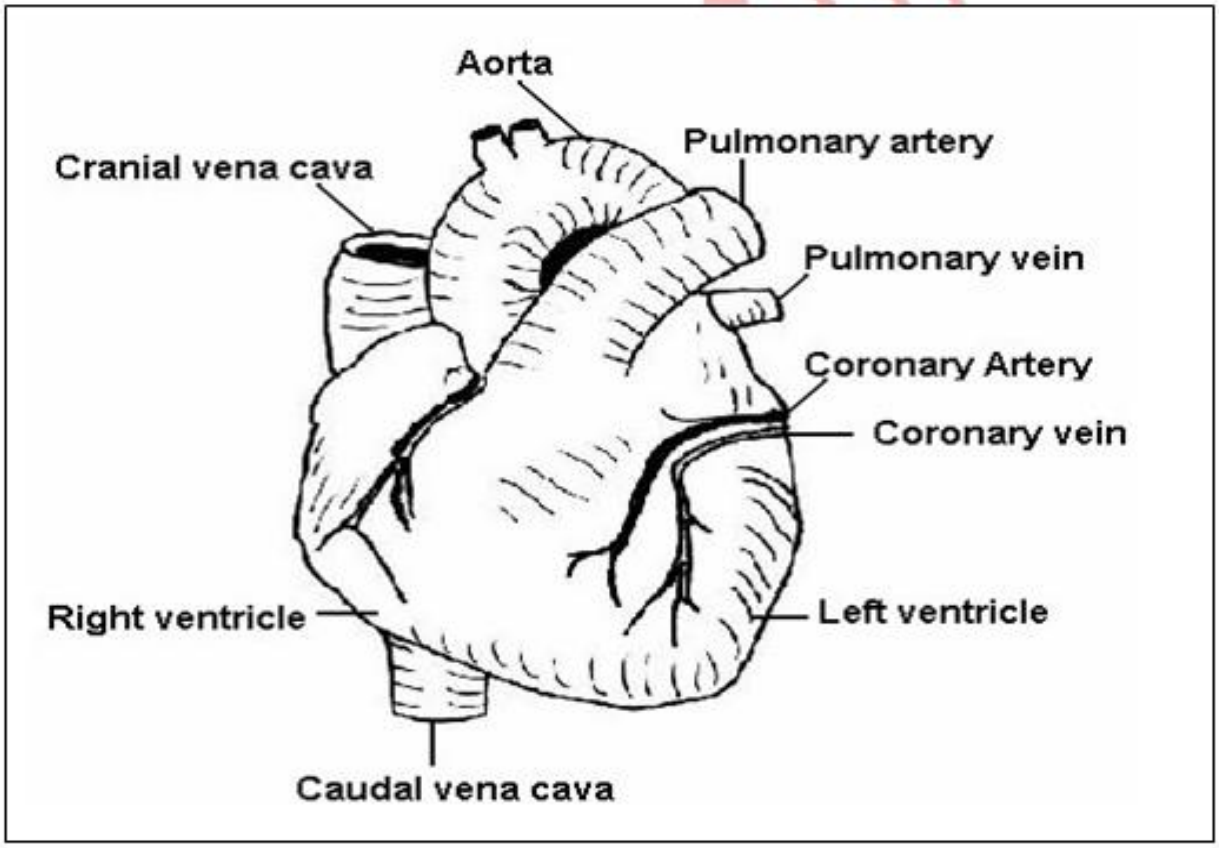
Parts of the heart and their functions





Parts of the heart and their functions

HEART - This is the organ that pumps blood throughout the body. It is muscular and placed between the lungs somewhere slightly to the left side of the body. The strong muscles of the heartcan relax or contract when contracting the heart pumps blood with force. When the heart relaxes, the blood flows into chambers of the heart

- The heart has 4 chambers.
- The upper chambers are known as **auricles** and the lower chambers are known as **ventricles**.
- The heart has 2 auricles, the **left auricle** and the **right auricle** and 2 ventricles and the **right ventricle** and the **left ventricle**.
- Auricle have thinner walls than ventricles
- The function of the heart is to pump blood to all parts of the body
- Auricles receive blood from body organs and then empty it into the ventricles.
- The ventricles then pump blood to the lungs and to other parts of the body
- The heart has **valves** that prevent blood from flowing backwards

The heart is connected to blood vessels Pumping of the heart

1. The **right auricle** receives blood from the bodyThe blood then flows into the **right ventricle** This blood does not have oxygen and is called **deoxygenated blood**

2. The **right ventricle** pumps the **deoxygenated blood** into the left into **lungs** throughthe pulmonary artery.

In lungs, the blood receives oxygen and becomes **oxygenated blood.**

3. The **oxygenated blood** flows from the lungs into the **left auricle** of the heart throughthe pulmonary vein

The blood then flows into the left ventricle

4. The left ventricle then pumps the oxygenated blood to all parts of the body(except thelungs) through the **aorta**

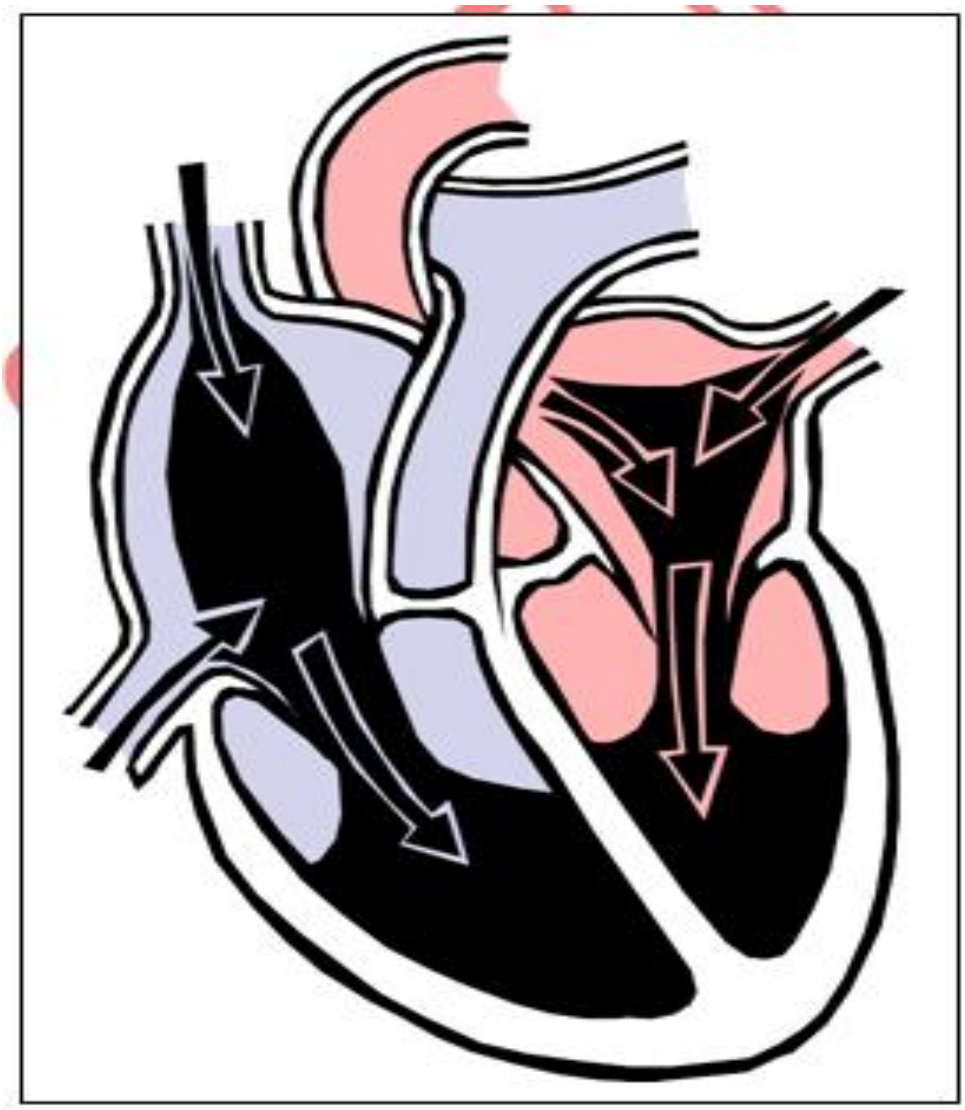
The left ventricle has thick muscular walls because they pump blood to all parts of thebody

5. The heart has **valves** which prevent blood from flowing backwards

Types of blood vessels and their functions

Blood vessels are tubes that carry blood around the body.The main blood vessels in the body are

1. Arteries
2. Capillaries
3. Veins



Arteries

- Arteries have thick elastic walls
- Arteries have a **narrow lumen**

Lumen is the space inside a tube such as a blood vessel

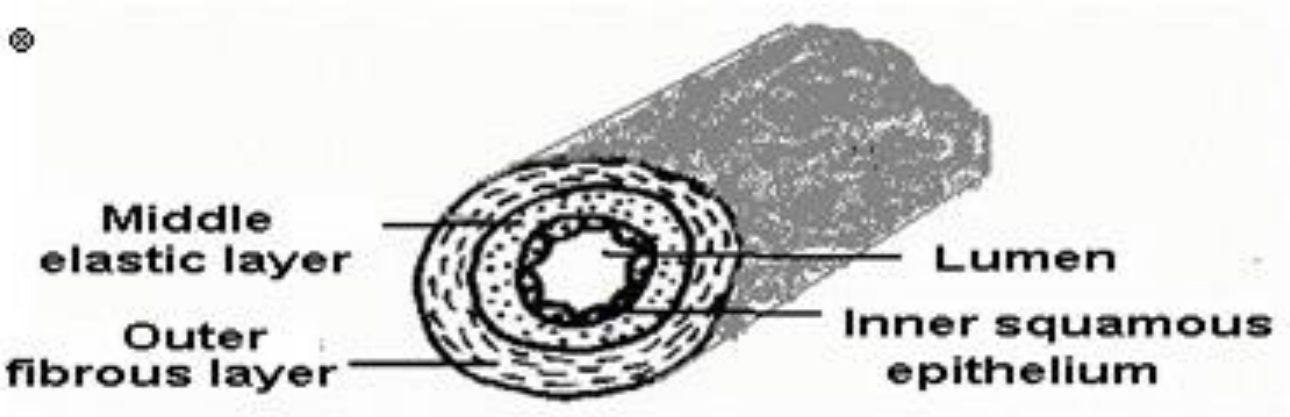
- Arteries carry blood away from the heart to the parts f the body
- Arteries carry oxygenated blood except the pulmonary artery which carriesdeoxygenated blood from the heart to the lungs

- Blood in arteries flow under high pressure because it is pumped from the heart intothe arteries at high pressure.

This high pressure can be felt in the arteries as a beat.

We can determine the number of times the heart **beats** in a minute by counting thebeats in the arteries

The number of times the heart beat in a minute is called a **pulse or a beat rate**.The pulse is easiest to find on the wrist and on the neck.



To check the pulse at the wrist

Pupil's activityPage 41-42

Name	Pulse at rest	Pulse after jumping
1.		
2.		
3.		
4.		
5.		

NB: the pulse increased after jumping

- The pulse rate of a healthy person at rest is between 60-100 beats per minute
- Pulse increased during an activity
- This because during activity, the body needs more oxygen and so the heart pumpsblood faster to supply the body with more oxygen.

Veins

1. Veins have **thin walls**
2. Veins have a **wide lumen**
3. Veins have **valves** to ensure blood flows only in one direction
4. Veins carry blood **towards** the heart
5. Veins carry **deoxygenated blood** except the **pulmonary vein** that carries **oxygenatedblood** from the lungs to the heart.

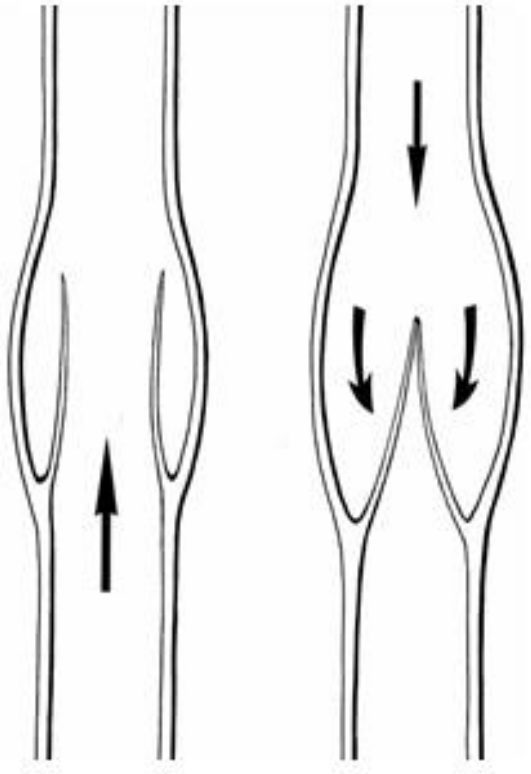
Valve A shows a vein with **open valve** to allow blood to pass through it while valve B shows a vein with **closed valve** to preventblood from flowing backwards

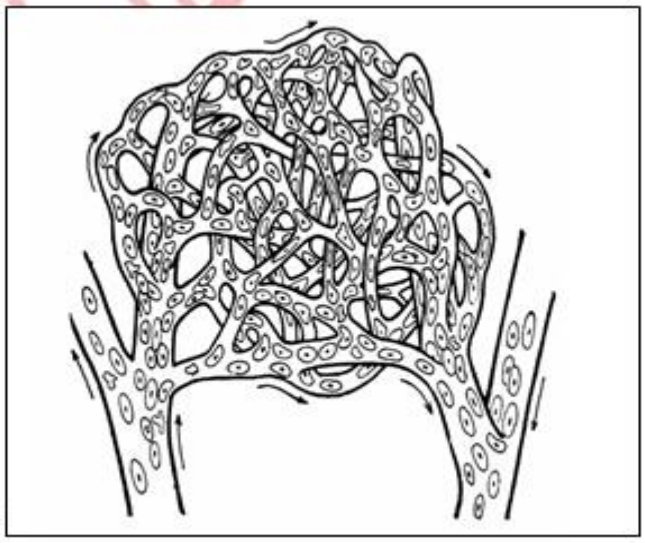
Capillaries

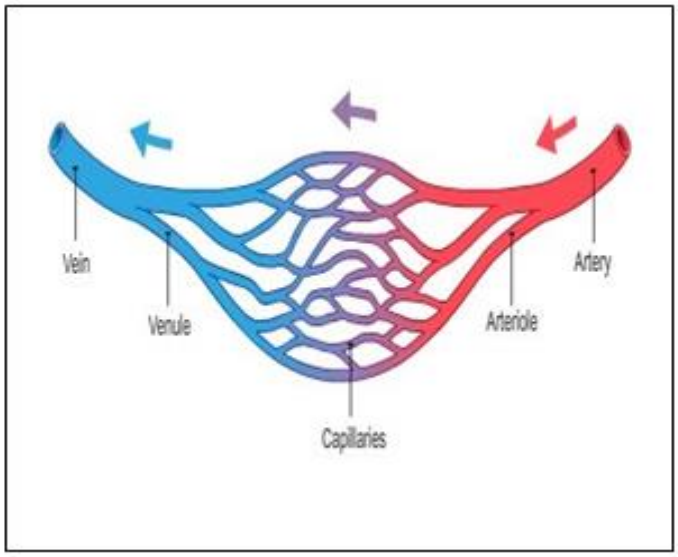
1. Capillaries have **very thin** walls
2. Capillaries have **no valves**
3. Capillaries reach every part of the body.

They allow movements of oxygen and food nutrients from blood into the body.

They also allow the movement of carbon dioxide and other wastes from the body intothe blood







Difference between arteries, veins and capillaries

Arteries	Veins	Capillaries
Have thick elastic walls,	Have thin walls andelastic,	Have thin walls
Have no valves	Have valves	Involved in the exchange of substances between blood and body organs
Carry blood away from the heart		Are very narrow,
		Form network in every organ and tissue

Components of blood and their functions

To find out the components of blood

Pupil's activityPage 43-44

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To study the components of blood

Pupil's activityPage 44

BLOOD COMPONENTS AND THEIR FUNCTIONS

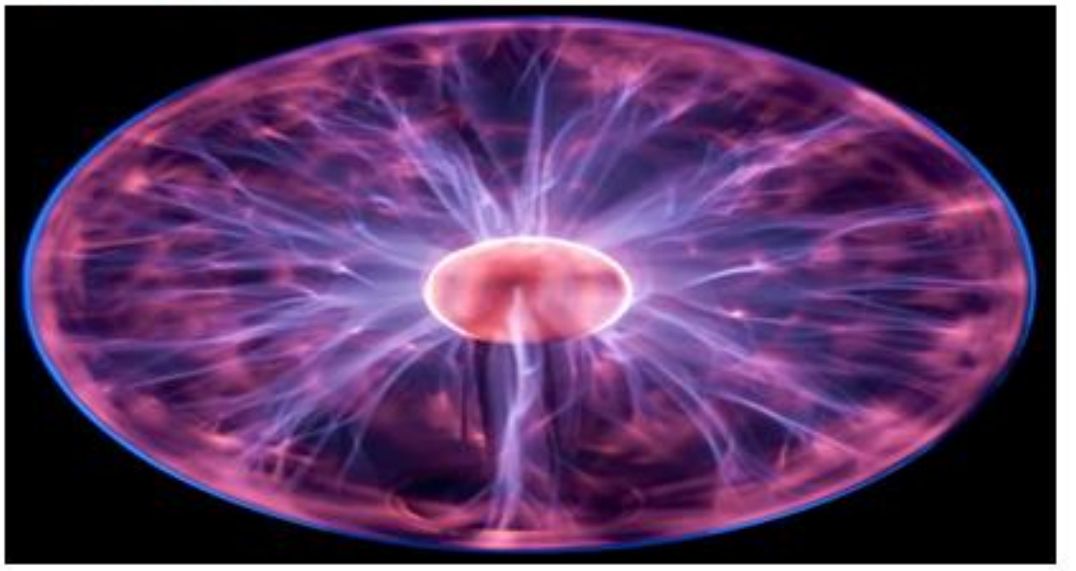
The four main components of blood are:

1. Plasma
2. Red blood cells
3. White blood cells
4. Platelets

1. Plasma

It is the liquid part that forms the main part of the blood. It is mostly pale yellow.

It contains dissolved substances e.g. digested food, salts, amino acids and glucose.



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