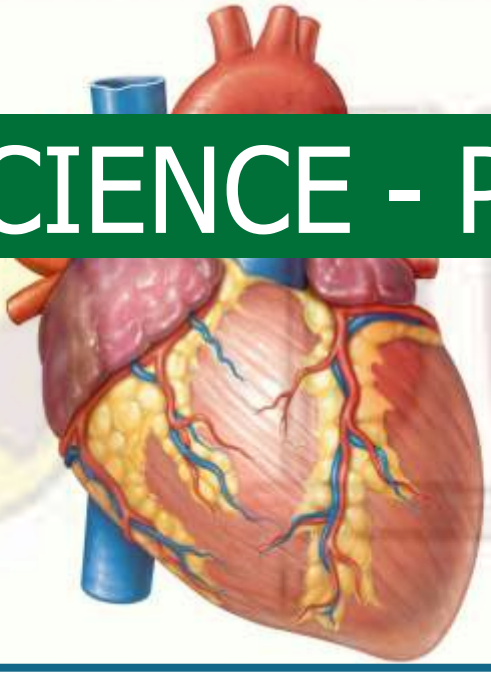
ASBAT
Education Consult

Revised Lesson Notes



SCIENCE - P.6

Term One

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THEME: WORLD OF LIVING THINGS

TOPIC ONE: CLASSIFICATION OF ANIMALS

LESSON 1: CLASSIFICATION OF LIVING THINGS (BASIC CHARACTERISTICS)

LIVING THINGS

- Living things are things that have life.

MAIN GROUPS OF LIVING THINGS

- Plants
- Animals

Examples of living things;

- Plants
- Insects
- Birds
- Human beings
- Worms etc.

Characteristics of living things

a) Living things respire.
b) Living things feed.
c) Living things respond to stimuli.
d) Living things grow.
e) Living things reproduce.
f) Living things excrete.
g) Living things move

CLASSIFICATION OF LIVING THINGS

- Classification means grouping of organisms according to their characteristics.

BASIC CHARACTERISTICS OF LIVING THINGS

1. They reproduce.
2. They respond to stimuli
3. They respire
4. They feed
5. They grow
6. The excrete
7. They move/locomote

REASONS FOR CLASSIFYING LIVING THINGS

- Makes it easy for us to identify them.
- Makes it easy to name them.

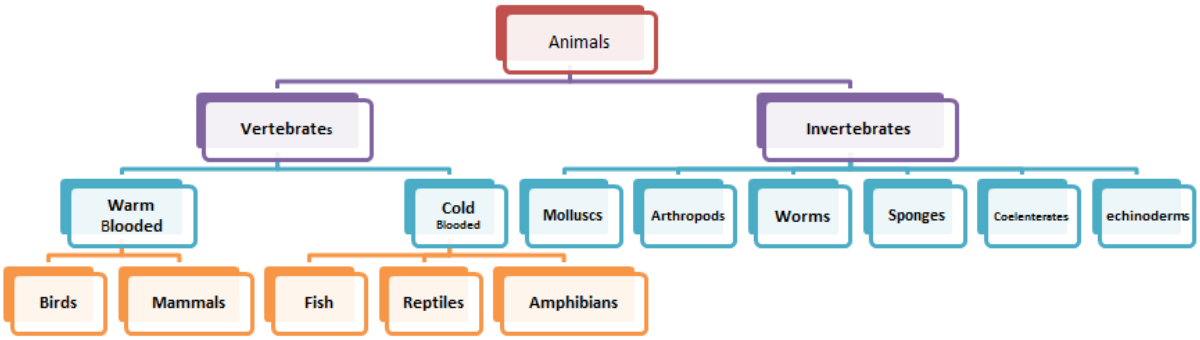
DIFFERENCES BETWEEN PLANTS AND ANIMALS

Plants	Animals
○ Make their own food ○ Green plants contain chlorophyll ○ Growth occurs only at the tips of roots and shoots ○ React slowly to stimuli ○ Continue growing throughout their life	○ Feed on already made food. ○ Don't have chlorophyll ○ Growth occurs equally on all parts of the body ○ React quickly to external stimuli ○ Stop growing long before their death

GROUPS OF ANIMALS

- Animals in the environment are grouped into **vertebrates** and **invertebrates.**

CLASSIFICATION OF ANIMALS



VERTEBRATES

- Vertebrates are animals with a back bone/vertebral column/spine.

CHARACTERISTICS OF VERTEBRATES

1. Vertebrates have a back bone
2. Vertebrates have endo skeleton.
3. They have a water proof skin.

CLASSIFICATION OF VERTEBRATES

Vertebrates are classified or grouped into two groups namely;

1. Warm blooded vertebrates
- Birds
- Mammals
2. Cold blooded vertebrates
- Reptiles
- Fish
- Amphibians

❖ **<u>Warm blooded animals</u>** are vertebrates that keep their body temperatures constant or slightly change.

Examples

All birds and mammals

❖ **<u>Cold blooded animals</u>** are vertebrates that change their body temperatures according to the environment.

Examples

Lizards, snakes, crocodiles, frogs, toads and fish

Learners' Activity

1. List any four characteristics of living things
2. In one sentence explain the term vertebrates
3. Identify any one characteristic common to all vertebrates.
4. Write one sentence to explain the following terms;
a) Warm blooded animals
b) Cold blooded animals
5. Give two examples of cold blooded animals
6. In one sentence give a reason why animals move.

SUB TOPIC: WARM BLOODED VERTERBRATES

LESSON 2: BIRDS (CHARATERISTICS OF BIRDS)

A bird is warm blooded vertebrate covered with feathers, two wings, two legs and a beak.

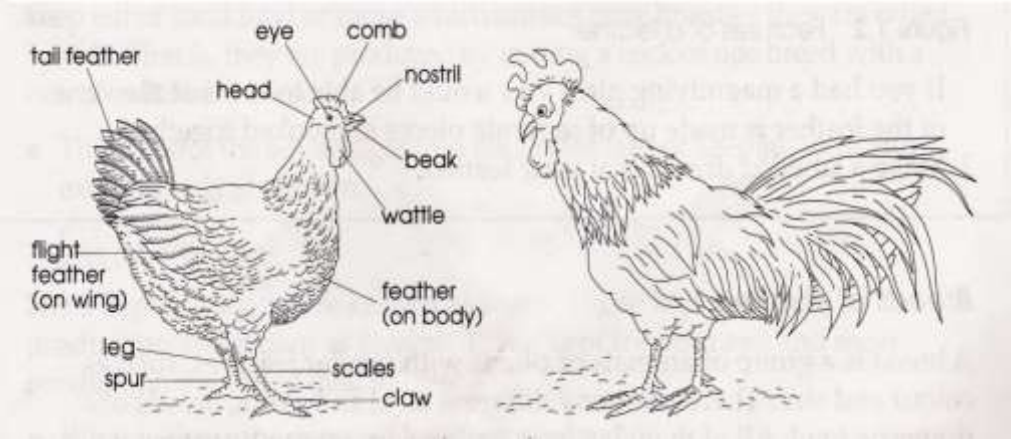
Characteristics of birds

- ❖ They are warm blooded vertebrates.
- ❖ Their legs are covered with scales and the body with feathers.
- ❖ They reproduce by means of laying eggs which are fertilized internally
- ❖ They breathe using lungs.
- ❖ They are stream lined/pointed at the front and the back to overcome friction (viscosity)
- ❖ They have a four chambered heart.
- ❖ Birds use beaks for pecking food.
- ❖ Birds care for their young ones
- ❖ They have endo skeleton.
- ❖ Birds have back bones

NOTE 1: birds use their front limbs modified as wings for flying and the hind limbs for walking.

An illustration showing the external parts of a bird.

NOTE 2: Their skin is dry, loose and has no sweat glands so cooling is effected by panting.



Note 3:

A bird has spurs on the legs for protection/defence.

- ➢ Birds use feathers for protection of the inner body parts from external damage.
- ➢ Feathers of birds provide warmth to the body of the bird.
- ➢ Feathers help the bird to fly especially those of the wings and tail.

Learners Activity

1. Give any four characteristics of birds
2. In one sentence give the functions of the following parts of the bird

a) Talons
b) Beak
c) feathers

3. State how birds reproduce
4. Draw and name the following parts of a hen

i) Spur
ii) Wattle

iii) Eye
5. In one sentence give two differences between a hen and a cock

SUB TOPIC: WARM BLOODED VERTERBRATES

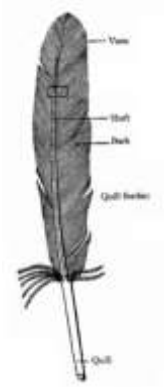
LESSON 3: BIRDS (BIRD FEATHERS)

Types of bird feathers;

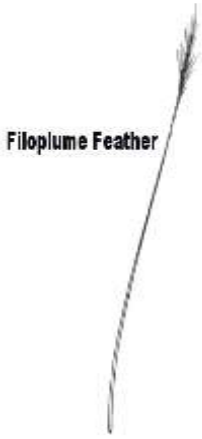
❖ There are basically four types namely;
1. Quill or flight feathers
2. Body or covert feathers
3. Down feathers
4. Filoplume feathers.

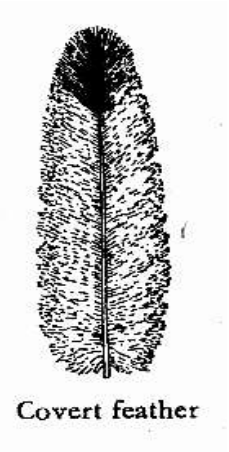
NOTE; Quill feathers are divided into primary and secondary feathers.

❖ Quill feathers have a strong central part called the shaft, the hollow portion. They are found on the tail and wings.
❖ Covert feathers help to cover the body of the bird
❖ Covert feathers are slightly smaller compared to Quill feathers.
❖ Filoplume feathers are the smallest and found nearest the skin of the bird.
❖ Down feathers help to trap a layer of air close to the body therefore keeping the bird's body warm.

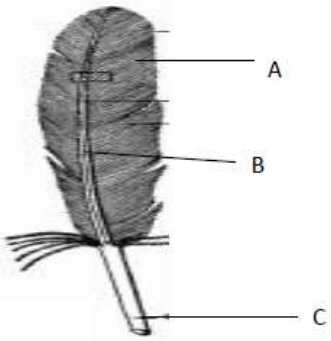


A Quill feather





Learners' activity 3.
1. State the importance of feathers to a bird
2. Identify the four types of feathers
3. Below is a diagram of a bird's feather. Use it to answer the questions that follow.



a) Identify the type of feather shown in the diagram
b) Name parts marked with letters A, B, C
c) In which way is the quill feather useful to a bird?

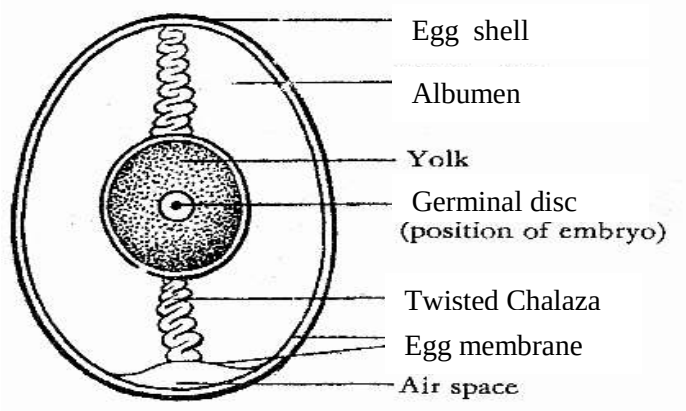
SUB TOPIC: VERTERBRATES

LESSON 4: BIRDS (REPRODUCTION IN BIRDS)

Reproduction in birds

- Birds reproduce by means of laying eggs.
- Their eggs are fertilized internally before they are laid out.
- A hen will sit on the eggs (incubate) until they hatch into young ones (chick)

An illustration showing parts of a fertilized egg.



Functions of the parts

Egg shell: protects the inner part of an egg.

It is porous to allow free circulation of air.

Air space: keeps and provides oxygen to the embryo.

Egg Yolk; provides carbohydrates/salts, fats to the grown embryo.

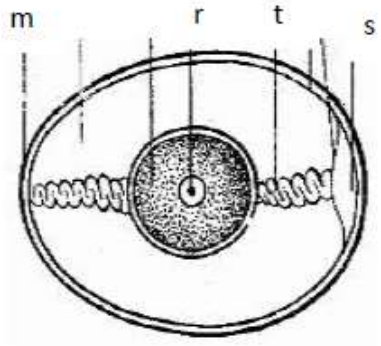
Embryo: develops into a chick under favourable conditions.

Albumen; Provides water and mineral salts to the growing embryo.

Chalaza; holds the Yolk and embryo in one position.

Learners' activity

1. Which type of fertilization occurs in birds
2. The diagram below shows a fertilized egg. Use it to answer the questions that follow.



a) Name parts of an egg marked r,t
b) State the functions of each of the following parts
i) s ii) m
c) What class of food is obtained from eating eggs?

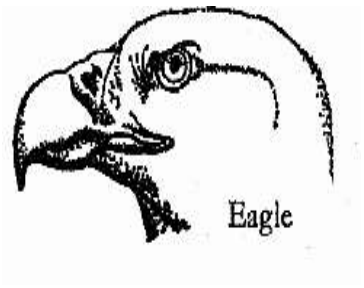
SUB-TOPIC: VERTEBRATES.

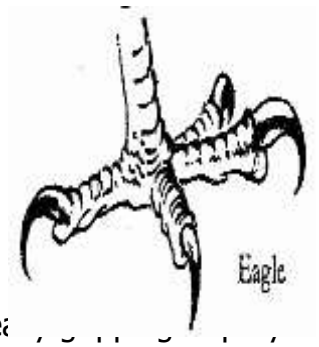
LESSON 5: GROUPS OF BIRDS. (Birds of prey and scavenger birds

Characteristics of birds of prey

- ❖ Have strong sharp hooked beak for tearing their prey
- ❖ Have strong curved talons for easy gripping of their prey.
- ❖ Have a strong eye sight to locate their prey.

A Beak of a bird of prey **A foot of a bird of prey**





Strong, sharp and hooked beak Short curved talons for ea

Scavenger birds.

- ❖ Are birds which feed on flesh killed by other animals
- ❖ Scavenger birds are useful in the environment because they keep the environment clean by eating flesh of dead animals which may rot or smell.

Examples: crows, vultures, marabou storks

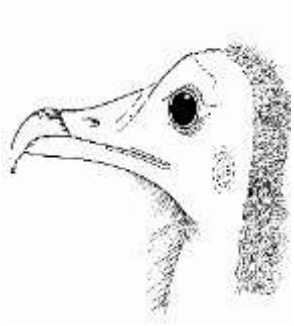
Examples of prey; smaller birds; chicks, frogs toads, tortoises/ turtles etc

Dangers of birds of prey to people

They eat people's chicks, rabbits.

Diagram showing a beak and foot of scavenger bird

Beak **Foot**



Strong, sharp and hooked beak Longer sharp, curved talons which grip fresh of the remains.

<u>Note:</u> scavenger birds have beaks similar to the birds of prey.

Compare the beaks of a bird of prey and a parrot.

Learners' Activity

1. State any one example of a scavenger birds
2. State the way a scavenger bird differs from a preying bird
3. How useful are scavenger birds in our environment
4. Apart from birds, name any other example of scavenger animals
5. State the meaning of the term scavenger birds

SUB-TOPIC: VERTEBRATES

LESSON 6: GROUPS OF BIRDS (PERCHING BIRDS, SCRATCHING BIRDS AND CLIMBING BIRDS)

Perching birds

These are birds that perch on branches of trees.

Have one toe pointing backwards and three toes pointing forward

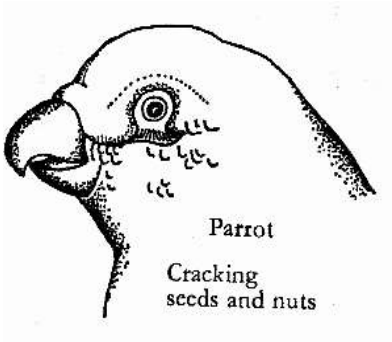
Note: Perching birds are grouped according to their habits and feeding.

These are seed eater, fruit eaters, insect eaters and nectar suckers.

Seed eaters: these have short conical beaks for easy splitting of seeds.

Examples include, pigeons, dove, weaver birds, finches, and parrot.

A structure of a head of a parrot



Insect eaters: These have short narrow beaks for easy picking up of the insects from barks of trees.

Examples include robins, sparrows, swift, swallows.

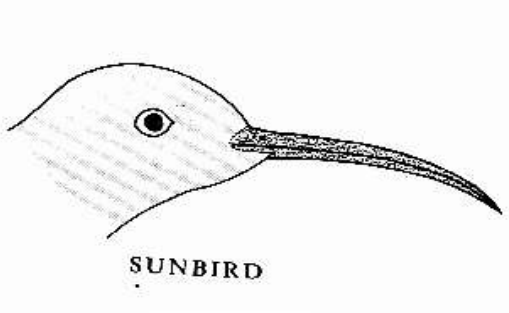
Note: Insect eaters have the ability to catch their prey on flight.

Structures showing a robin and sparrow birds.

Nectar suckers: these have long slender beaks for easy sucking of nectar from flowers.

Examples are; the sun bird and humming bird.

An illustration showing a beak of a sun bird.



Fruits eaters: These have long stout beaks for collecting fruits from trees.

- ❖ They are also called foresters and help in seed or fruit disposal.
- ❖ A horn bill is the best example of a fruit eater

Scratching birds

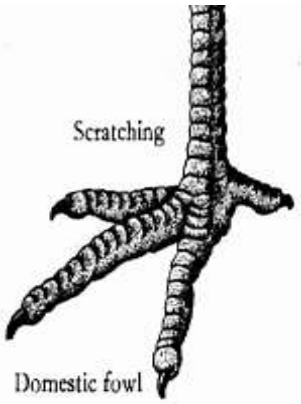
- ❖ These are birds which scratch earth to find their food.
- ❖ Such birds get worms, small insects and seeds from soil.

Characteristic of scratching birds.

- ❖ They have strong feet with thick toes and blunt talons.
- ❖ They have strong pointed beaks for picking up things from the ground.

An illustration showing a beak and foot of a scratching bird.

Strong foot thick toes and blunt claws

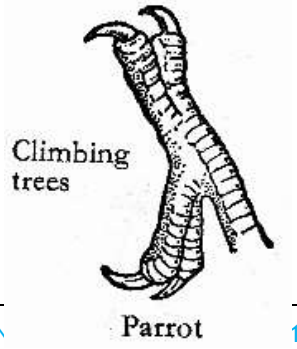


Strong short pointed beak for picking up food from soil

Climbing birds

- ❖ These are birds with two toes pointing forward and two pointing backwards.
- ❖ The toe arrangement helps them to climb trees looking for seeds and insects.
- ❖ They commonly live in trees and run about on branches of trees.

An illustration showing the toes of a climbing bird.



Two toes forward and two toes backwards.

Examples include parrots and wood pecker. They are the best examples of climbing birds.

Learners' Activity

1. In a sentence explain the meaning of the term perching birds
2. Identify any two characteristics of the perching birds
3. Give two ways in which perching birds are useful to a crop farmer
4. In one sentence describe the following groups of perching birds:

i) Seed eaters
ii) Insect eaters
iii) Fruit eaters
iv) Nectar suckers

5. Give any one example of a nectar sucker
6. In one sentence describe how perching birds feed.
7. List the examples of scratching and climbing birds

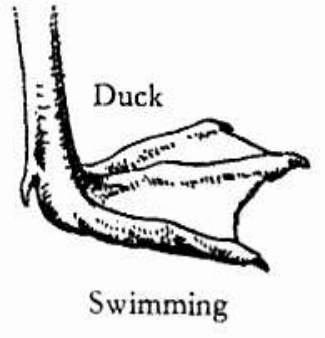
SUB-TOPIC: VERTEBRATES (BIRDS)

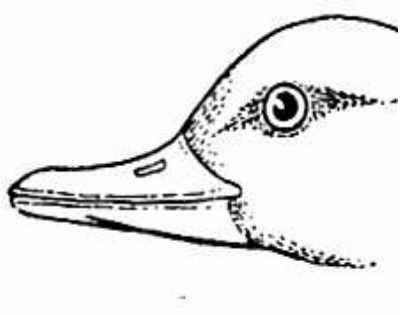
LESSON 7: SWIMMING BIRDS

These are birds with webbed feet for padding in water they swim

- **Examples include,** swan, duck, goose, penguin, sea gull, pelican.
- They have a spoon shaped beak for easy sieving of their food from mud/water.
- They have a layer of fats to keep them warm in water.
- They are commonly seen in water looking for their food.

An illustration showing the foot and a beak of a swimming bird





A webbed foot for padding in water

Spoon shaped beak for easy sieving of food from water/mud.

Learners' Activity

i) What is meant by the term swimming birds?
ii) List any two examples of swimming birds
iii) State two ways in which swimming birds are adapted to their mode of life
iv) In the space below draw a foot of a swimming bird

SUB-TOPIC: VERTEBRATES (BIRDS)

LESSON 8: WADING AND FLIGHTLESS BIRDS

Wading birds;

❖ Wading birds are birds that walk through water or wade mainly to find their food.

Wading birds have the following characteristics.

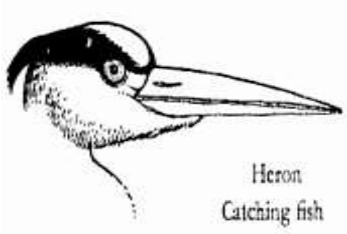
1. Have long beaks for easy hunting of small fish, frogs and worms from water for food.

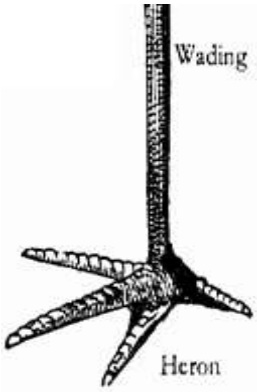
Examples of wading birds

Ibis, heron, eaglet, crested crane, flamingo birds, storks.

2. Have long thin legs with half webbed toes widely spread out to prevent them from sinking in water.

An illustration showing a beak and a foot of wading bird





A beak for a wading: bird long and strong

Half-webbed toes to prevent sinking in water

Flightless birds.

❖ These are birds which cannot fly but run very fast.
❖ Their bodies are heavier compared to the wings hence unable to fly.
❖ They have a lot of bone marrow hence heavier to fly in air with their weaker and smaller wings.

Examples of flightless birds includes;

Ostrich, Kiwi, Emu, Penguin, Cassowary

Note: ostriches are commonly kept in the zoo and their eggs are edible.

A structure showing an ostrich

Weak and small wings compared to the body size.

Learners' Activity

1) In one sentence state the meaning of the following terms:
i) Wading birds
ii) Flightless birds
2) Give two examples of;
i) Wading birds
ii) Flightless birds
3) Name the flightless bird commonly kept in the zoo.

SUB-TOPIC: VERTEBRATES (BIRDS)

LESSON 9: ADAPTATIONS OF BIRDS TO THEIR MODE OF LIFE

Adaptation of birds to their mode of life.

Adaptation means the features that make an organism suit a characteristic or behavior.

Adaptation of birds to their mode of life include:

Their front limbs are modified into wings for easy flight.

- Most have hollowed bones to reduce their body weight for easy flying.
- They have a stream lined body to overcome viscosity during flight.
- They have no pinna to obstruct the flow of air on flight.
- Their bodies are covered with feathers to provide warmth and colour to the bird.
- They have a nictitating membrane which protects their eyes against foreign bodies into the eye on flight.

Advantages of birds to people

- Birds provide people with meat and eggs as food.
- Some birds such as sun bird help in plant pollination.
- Some birds (scavengers) help to keep the environment clean
- Domestic birds are a source of income once sold.

Disadvantages of birds in the environment.

- Many birds spoil farmer's crops i.e getting raw materials to make their nests, feed on crops etc.
- Birds cause noise pollution especially weaver birds in the environment.
- Bird feathers keep vectors to human health like fleas and mites.

Learners' Activity

1) State any four ways in which birds are adapted to their mode of life
2) In four sentences state the importance of birds to people
3) State how birds can be dangerous in our environment

SUB-TOPIC: VERTEBRATES (MAMMALS)

LESSON 10: CHARACTRISTICS OF MAMMALS.

Mammals; These are worm blooded vertebrates whose skin is colored with hair.

General Characteristics of mammals include;

- They have mammary glands
- They have well developed ear lobes to trap sound waves.

- They have fur on their bodies.
- They breathe through the lungs.
- They have four chambered hearts.\most mammals give birth to their young ones alive except the egg laying mammals
- They have back bones.
- All mammals are warm blooded.

Specific characteristics of mammals

- Their bodies are covered with fur
- They have mammary glands
- They feed their young ones on breast milk produced by the mammary glands.

Classification of mammals.

Mammals are grouped into nine sub classes according to their features and behavior.

These are;

- Primates (most advances mammals)
- Rodents (gnawing mammals)
- Ungulates (hoofed mammals)
- Chiroptera (flying mammals)
- Monotremes (egg laying mammals)
- Carnivores (flesh eaters)
- Marsupials (pouched mammals)
- Insectivores (insect eating mammals)

Learners' Activity

1) In a sentence explain the term mammal
2) Give a reason why mammals are referred to as vertebrates
3) List the different groups of mammals
4) In one sentence give a reason why a kangaroo is regarded as a mammal

SUB-TOPIC: VERTEBRATES (MAMMALS)

LESSON 11: PRIMATES AND MONOTREMES

Primates (most advanced mammals)

- Primates are the most advanced subclass of mammals.
- They have a well developed set of teeth (32)
- Primates have an advanced brain.

Characteristics of primates.

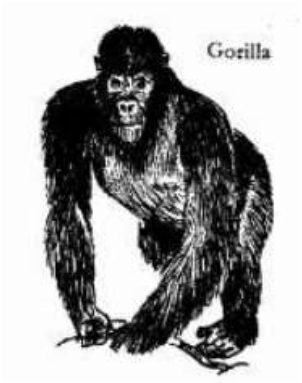
- They have five fingers and five toes on each foot.
- They use their front limbs for holding things while hind limbs for walking.
- All primates are omnivores feed on both flesh and vegetables)

Examples of primates includes;

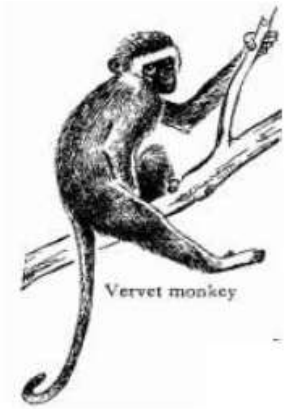
People, gorillas, chimpanzee, baboon, bush baby, monkey, apes, gibbon

Drawn structures showing a bush baby, a monkey and a gorilla.

A bush baby



A gorilla



A monkey

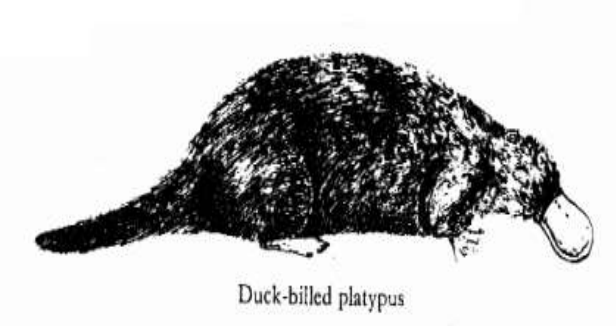
Egg – Laying Mammals (Monotremes)

- These are mammals which reproduce by means of laying eggs.
- They are also called mammals because they feed their young ones on milk from mammary glands.

Examples of monotremes include;

There are only two examples of monotremes namely; duck billed platypus and spiny anteater (echidna)

Illustrations showing monotremes



Learners' Activity

1) What is meant by the term monotremes
2) Give any two examples of monotremes
3) State any two reasons why primates differ from other mammals
4) Explain why monotremes are grouped under mammals
5) In which way is duck billed platypus similar to a spiny anteater

SUB-TOPIC: VERTEBRATES (MAMMALS)

LESSON 12: FLYING MAMMALS (CHIROPTERA)

Chiroptera (flying mammals)

- These are the only mammals that fly.
- They have fold skin attached to the fore limbs which act as wings. Bats are the only true examples of chiropteras.

There are three types of bats namely;

- ❖ Fruit eaters or foresters.
- ❖ Insect eaters.
- ❖ Blood suckers (vampires)

Note; Bats are nocturnal animals i.e they are more active during the night.

- ❖ Bats use echoes to locate their food at night and dodge obstacles on flying.

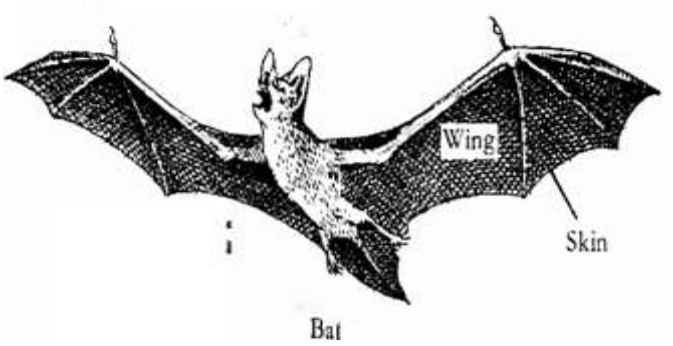
Importance of bats in the environment.

- ❖ Fruit eating bats help in seed dispersal.
- ❖ Insect eating bats help to eat harmful insects in the environment that may cause harm to people such as mosquitoes etc.

Disadvantages of bats.

- ❖ Vampire bats suck blood from animals which may cause anaemia to the animal and even death.
- ❖ Waste materials from bats cause a bad smell in a living house.

An illustration showing a bat flying.



Learners' Activity

1) State any one example of a flying mammal
2) Name the three types of bats
3) Of what importance are echoes to bats?
4) In one sentence state how bats are useful in our environment
5) How can vampire bats be dangerous to animals
6) In one sentence state a reason why bats are regarded as mammals

SUB-TOPIC: VERTEBRATES (MAMMALS)

LESSON 13: POUCHED MAMMALS (MARSUPIALS)

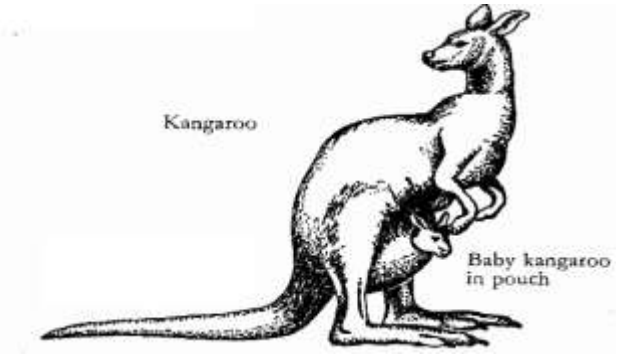
Pouched mammals;

- ❖ These are mammals with pockets on their abdomen inside where mammary glands are found.
- ❖ They are commonly found in Australia and South Africa.

Examples of pouched mammals include;

Kangaroo, koalabear, wallabies, opossums

An illustration showing a kangaroo with its young one.



Note; The word marsupial means a pouch or a bag

- A kangaroo can leap or jump a great distance.

Learners' Activity

1) Apart from kangaroos give any two other example of pouched mammals
2) Explain why Marsupials are called mammals
3) State two ways in which marsupials are adapted to their mode of life

SUB-TOPIC; VERTEBRATES (MAMMALS)

LESSON 14: FLESH EATING MAMMALS (CARNIVORES)

Flesh eating mammals (carnivores)

These are sub groups of mammals with well developed canine teeth and feed on flesh.

Characteristics of fresh eating mammals.

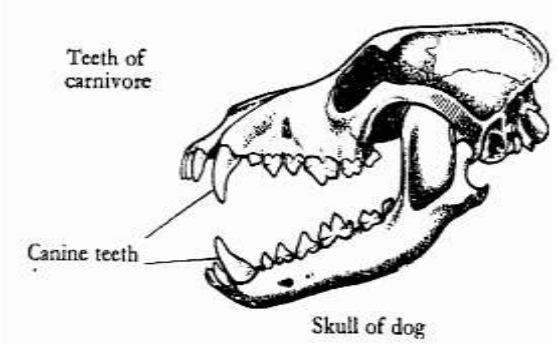
- They have sharp claws for holding, killing and tearing their prey.
- They have soft pads feet to enable them run after their prey without making noise.
- They have a good speed, sense of smelling and vision even at night.

Groups of carnivores include;

Carnivores are sub divided into two divisions namely;

a) **Cat family**; these have features of the domestic cat.
Examples include; lion, cheetah, leopard, tiger etc.
b) **Dog family**; these are carnivores with specific features to that of a domestic dog.
Examples include, domestic dog, hyena. Jackals. Fox etc

An illustration showing the skull of a dog.



Note; Some carnivores are scavenger and therefore feed on flesh killed by other carnivores.

❖ Carnivores are also called preying mammals and are predators.

A predator is an animal that hunts and kills its prey.

Learners' Activity

1) Explain the term carnivores
2) State two ways in which carnivorous animals are adapted to their mode of feeding
3) Give any two ways in which scavengers are useful in the environment
4) Identify a group a carnivorous animals in which the the following animals belong
i) Leopard
ii) Domestic dog
5) State one difference between a preying mammal and a predator

SUB-TOPIC: VERTEBRATES (MAMMALS)

LESSON 15: SEA MAMMALS (CETACEANA)

Sea mammals;

These are mammals which commonly live in water of seas and oceans.

Characteristics of sea mammals

❖ They breathe through the lungs.
❖ They reproduce by means of giving birth and feeding their young ones on milk from mammary glands.
❖ They have fur on their bodies.

Examples of sea mammals.

Whale, dolphins, porpoise, seals and dugongs.

Note; whales are divided in to two namely, blue whale and sperm whale.

❖ A whale is the largest mammal. A whale is over 30m long and over 150 tones in weight .The whale is not a fish.
❖ A thin layer of blubber insulates the body against heat loss and it is an important food store.
❖ Whales are hunted by people for their high quality oil.

Drawn structures showing different examples of sea mammals

A whale	Seals
	
Porpoise	Dolphin
	

- Sea mammals have some features similar to that of fish.
- All sea mammals are vertebrates and are warm blooded.

Learners' Activity

1) In one sentence explain the meaning of the word sea mammals
2) List any three examples of sea mammals
3) Write any two characteristics of sea mammals
4) Name the largest mammal
5) Of what importance is thin layer of blubber to a whale?

SUB TOPIC: VERTEBRATES (MAMMALS)

LESSON 16: GNAWING MAMMALS (RODENTS)

Gnawing mammals (rodents)

- These are mammals with well developed incisor teeth and chew rapidly.

Examples of rodents include;

- Rabbits
- Rats
- Squirrels
- Porcupine
- Mice
- Moles
- Bearers

Characteristic of rodents.

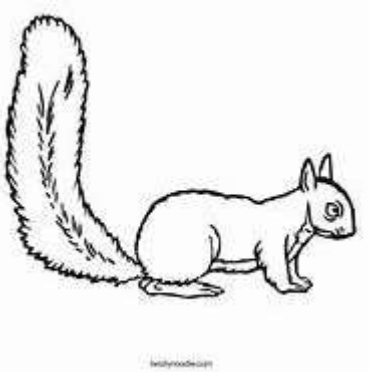
- They have well developed incisor teeth for biting and chewing rapidly.
- They don't have canine teeth.
- Most gnawing mammals are vegeterians therefore, feed on vegetables.

- ❖ Most rodents are small in size for easy running very fast.
- ❖ Most rodents make holes in soil called burrows for protection and as a habitat.
- ❖ They have sharp strong claws for digging up root crops.

Disadvantages of rodents to crop farmers.

- ❖ All rodents are crop pests.
- ❖ They destroy farmer's crops by causing damage to them.
- ❖ Some destroy stored harvested crops in the granaries especially the rats..

Drawn structure showing a rat and a squirrel.

Rat	**Squirrel**
	

Learners' Activity

1) Write one sentence to explain the meaning of the word gnawing mammal
2) List any four characteristics of gnawing mammals
3) Give three ways in which rodents are a disadvantage to a crop farmer
4) State how rodents are adapted to their mode of feeding

SUB-TOPIC: VEGETERIANS (MAMMALS)

LESSON 17: UNGULATES (HOOFED MAMMALS)

Ungulates (hoofed mammals)

These are mammals which feed on vegetables and have hooves on their toes.

Characteristics of ungulates or hoofed mammals.

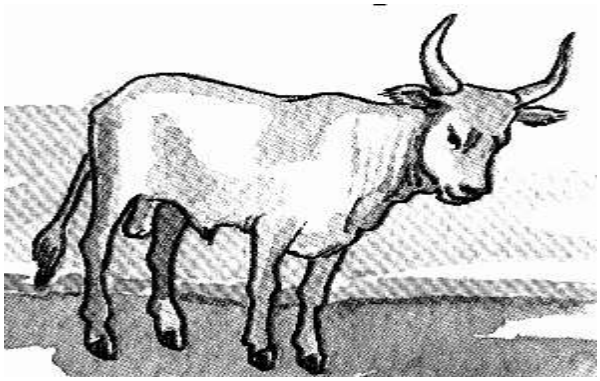
1. They mainly feed on plant materials.
2. They have toes divided into two namely.

(i) Even toed , ungulates e.g cow, goat, sheep. Deer, camel etc
(ii) Odd toed ungulates e.g elephant, horse, zebra, donkey etc.

3. Some ungulates are ruminant and chew cud.
4. Ruminant ungulates have four chambered stomachs.
5. Some ungulates do not chew cud and have one true stomach.

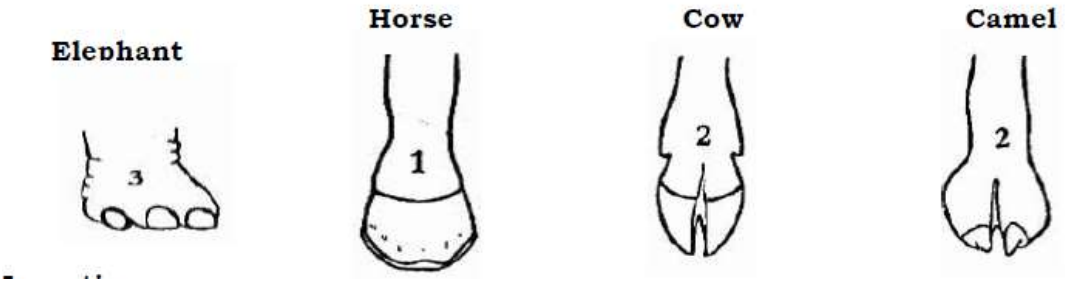
Note: cud is food an animal brings back from the stomach to chew again. This is called rumination. Ruminant animals are animals with four chambered stomachs and chew cud. e.g goats, sheep etc.

Diagram of a ruminant animal



Examples of non-ruminant animals are, Hippopotamus, Pigs And Warthogs.

Drawn structures showing different toes of ungulates



Insectivores

- These are mammals that feed on insects.
- Most of them are nocturnal.

Examples of insectivores include;

- Hedgehog
- Antbear
- Porcupine
- Shrew.

Things to note:

- A hedge hog stops and hides its head it curls or rolls into a ball for protection.
- A porcupine has spines for protection.

Learners activity

1. State any two characteristics of ungulates
2. How are odd toed ungulates different from even toed ungulates
3. In one sentence explain the term ruminants
4. Give two examples of ruminant animals
5. How does a porcupine protect its self.

SUB-TOPIC: VERTEBRATES (COLD BLOODED)

LESSON 18: REPTILES (SNAKES)

Reptiles.

- ❖ Reptiles are animals which move by crawling
- ❖ The word reptile comes from reptalia meaning crawlers.
- ❖ Reptiles commonly live in warm countries.

Characteristics of reptiles.

- ❖ All reptiles are cold blooded (poikilothermic)
- ❖ Reptiles breathe through their lungs.
- ❖ They reproduce by means of laying eggs fertilized internally.
- ❖ All reptiles have their bodies covered with scales.
- ❖ They have three chambered heart i.e two atria and one ventrical.

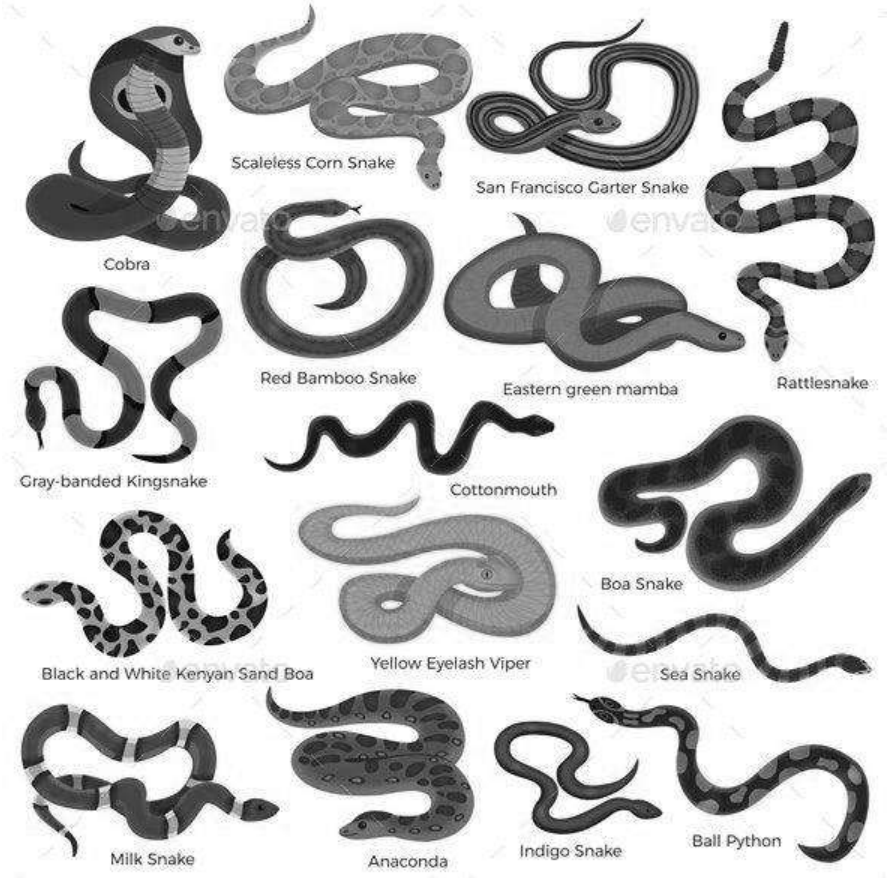
Groups of reptiles.

The main groups of reptiles include , snakes, lizards, tortoises, alligators, crocodiles.

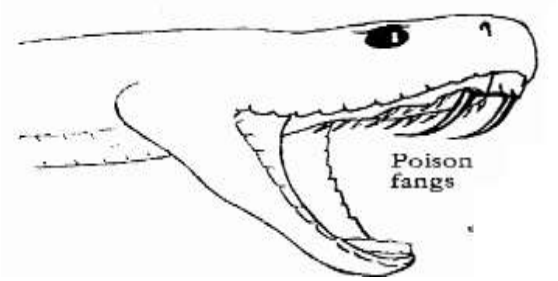
Snakes.

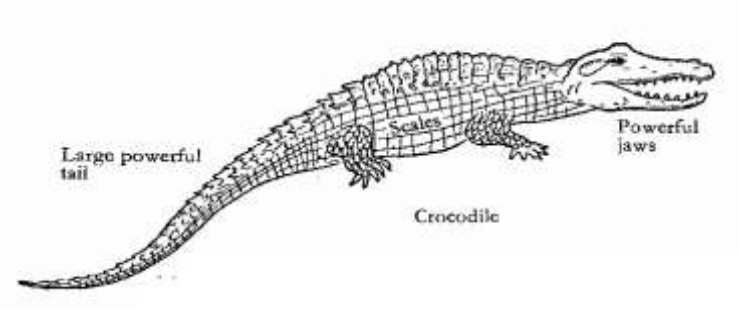
- ❖ Snakes are groups of reptiles with no limbs and move by gliding/ slithering/ crawling caused by contraction of their muscles.
- ❖ They moult to grow a new skin and increase in size.
- ❖ They have a forked tongue which acts as a sense organ for smell and touch.
- ❖ Snakes commonly move with their tongues out for protection and easy trapping of its prey.
- ❖ Snakes are carnivorous animals.

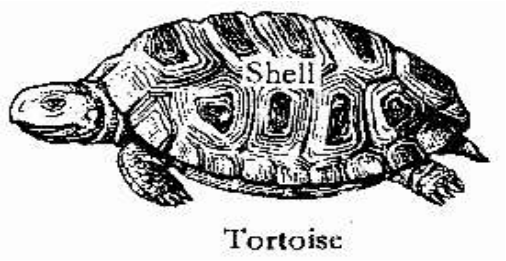
Diagrams of different snakes

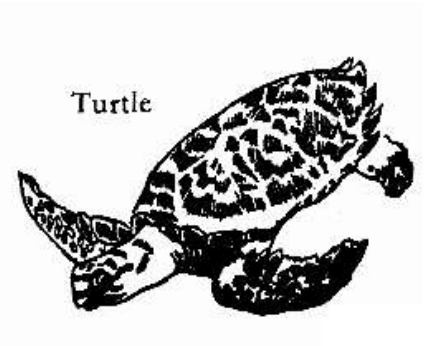


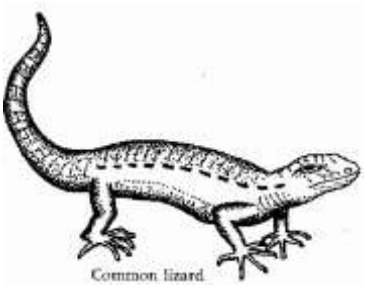
Note; Moulting is the removal of the outer old skin to allow the snake grow a new skin and increase in size.

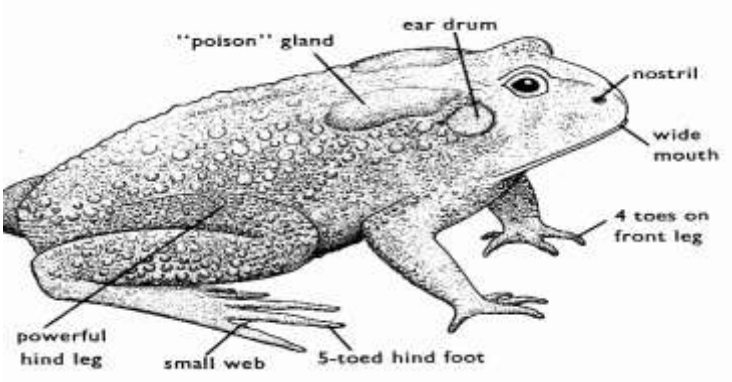


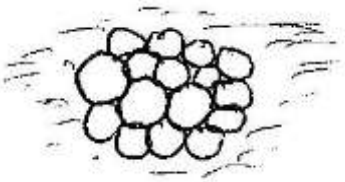

Large powerful tail
Scales
Powerful jaws
Crocodile

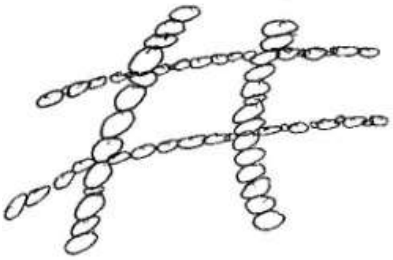

Shell
Tortoise

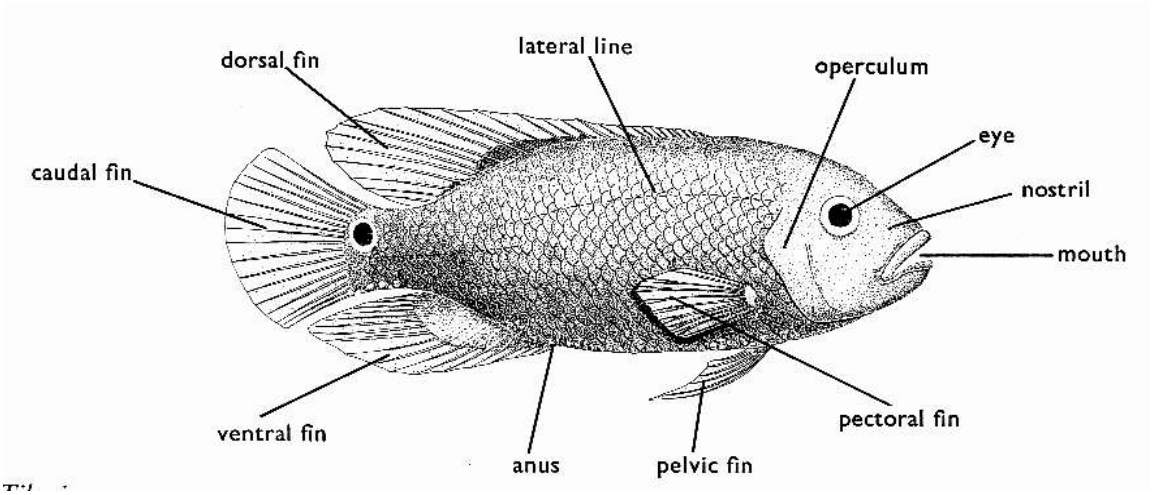

Turtle

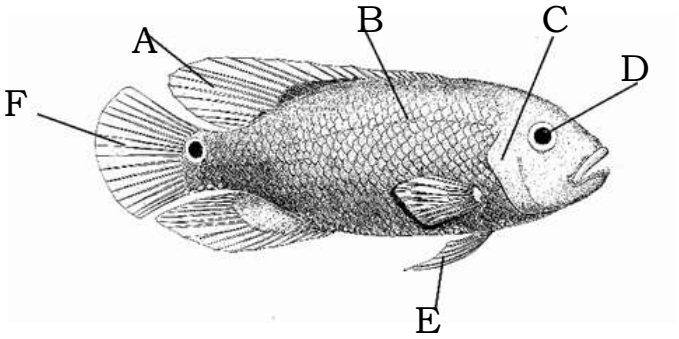

Common lizard

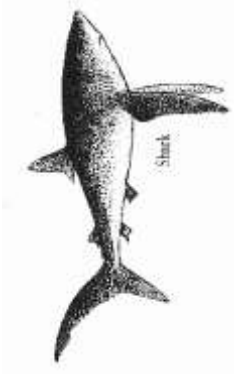

"poison" gland
ear drum
nostril
wide mouth
4 toes on front leg
powerful hind leg
small web
5-toed hind foot

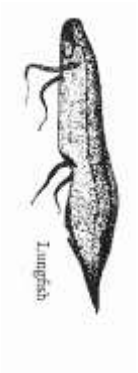


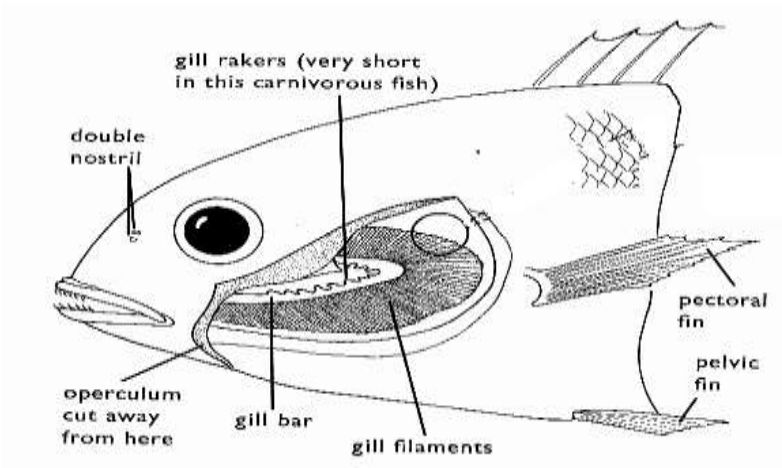


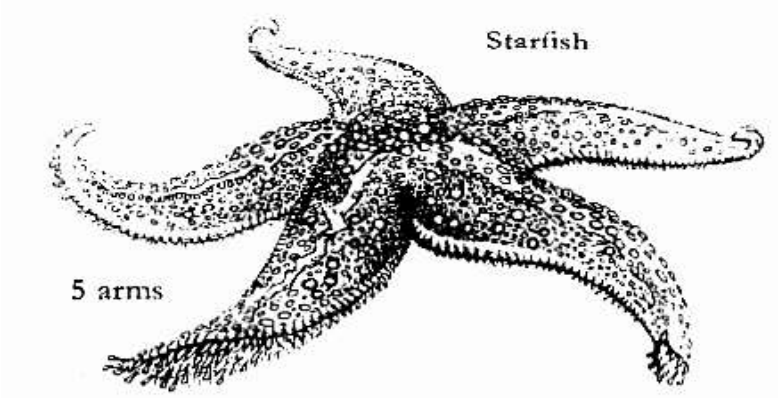

dorsal fin
lateral line
operculum
eye
caudal fin
nostril
mouth
ventral fin
anus
pelvic fin
pectoral fin

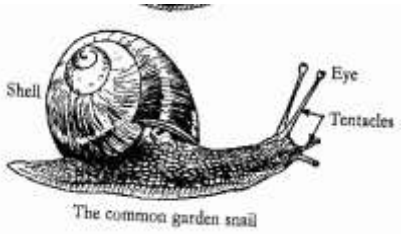

A
B
C
D
E
F


Shark

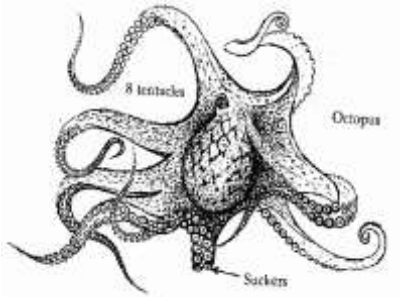

Lungfish

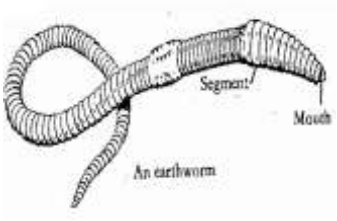

gill rakers (very short
in this carnivorous fish)
double
nostril
pectoral
fin
pelvic
fin
operculum
cut away
from here
gill bar
gill filaments

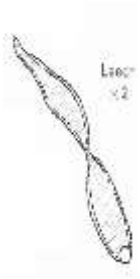

Starfish
5 arms

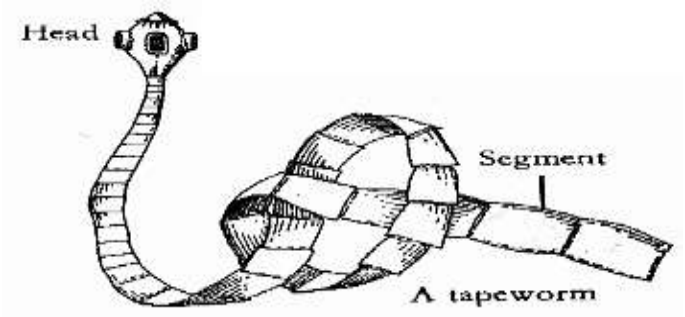


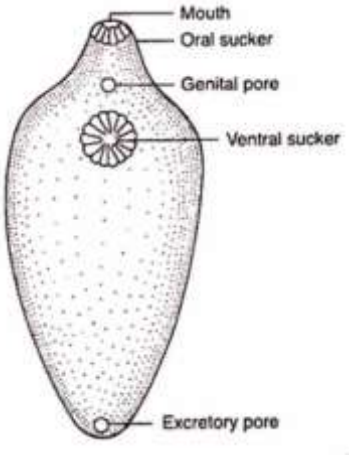
The common garden snail

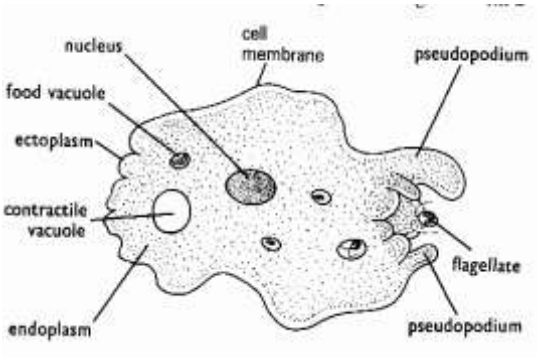


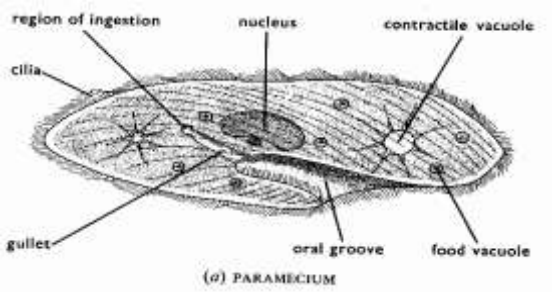

Segment
Mouth
An earthworm

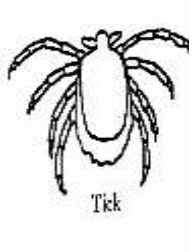
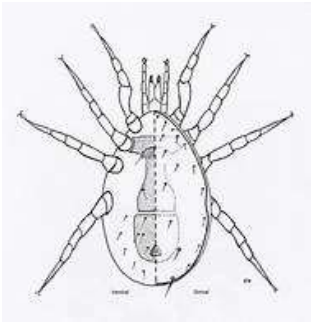


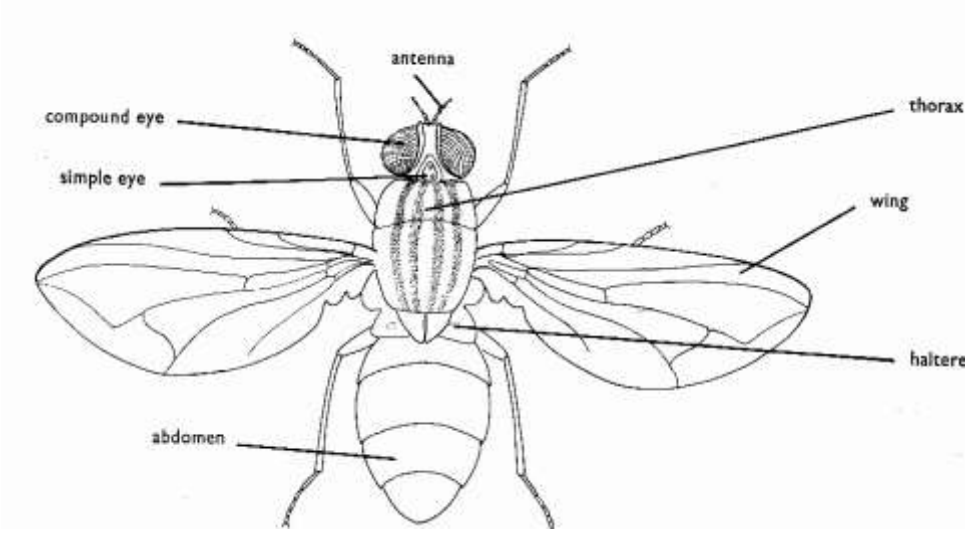

Head
Segment
A tapeworm

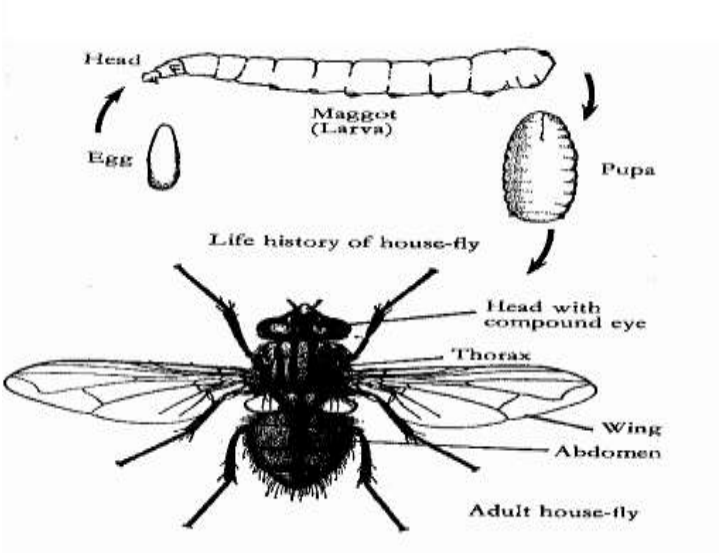

Mouth
Oral sucker
Genital pore
Ventral sucker
Excretory pore

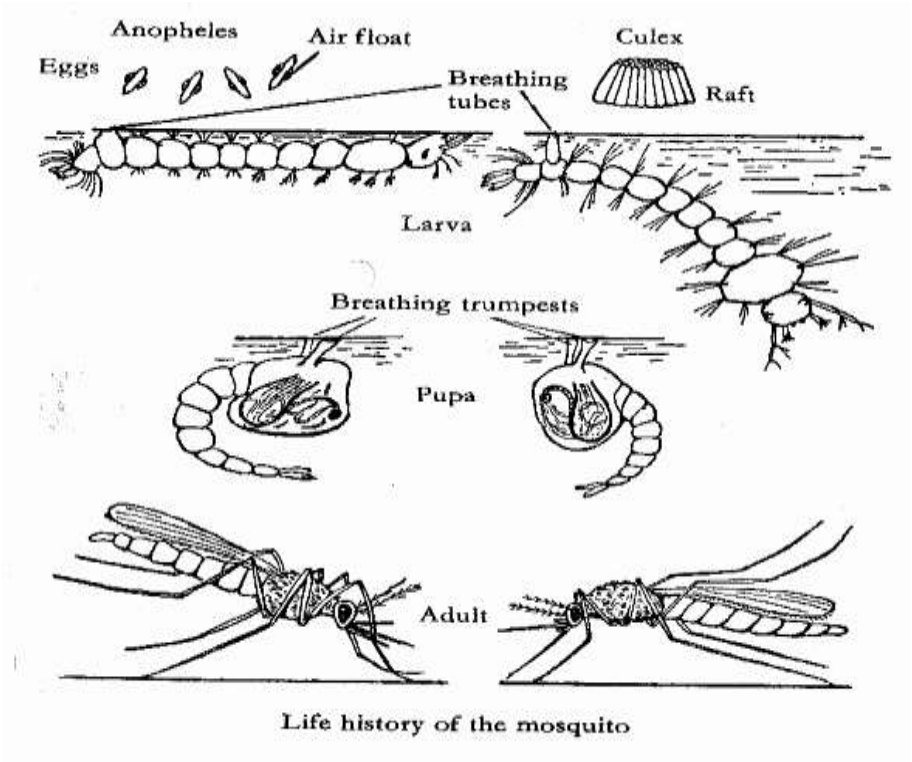

nucleus
cell membrane
pseudopodium
food vacuole
ectoplasm
contractile vacuole
flagellate
endoplasm
pseudopodium


region of ingestion
nucleus
contractile vacuole
cilia
gullet
oral groove
food vacuole
(a) PARAMECIUM

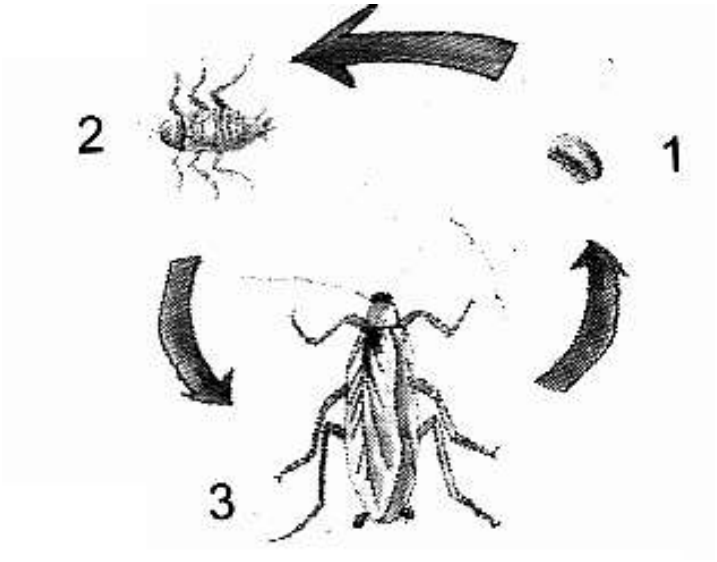
 Tick	
	

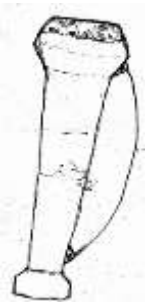

antenna
compound eye
simple eye
thorax
wing
haltere
abdomen

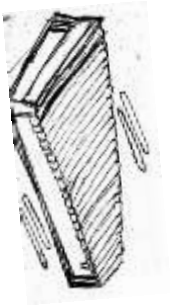


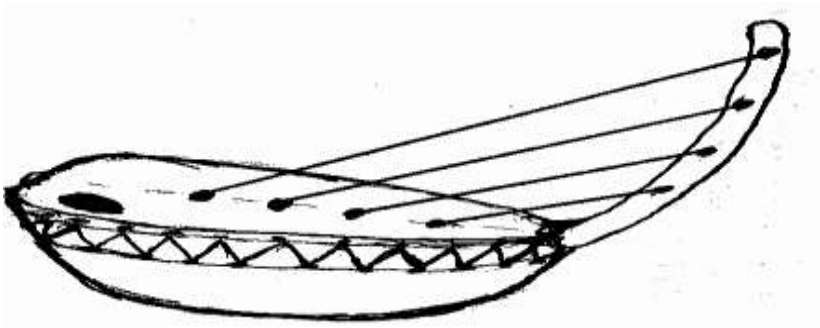


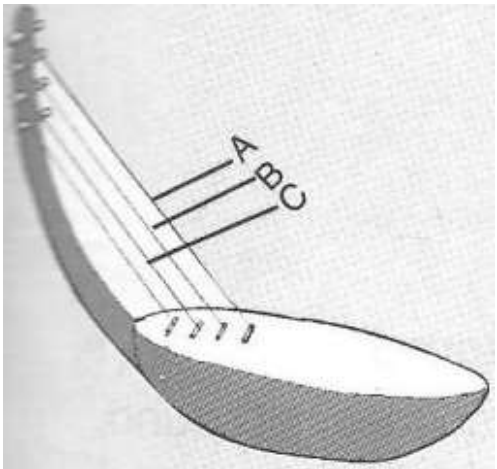
Life history of the mosquito

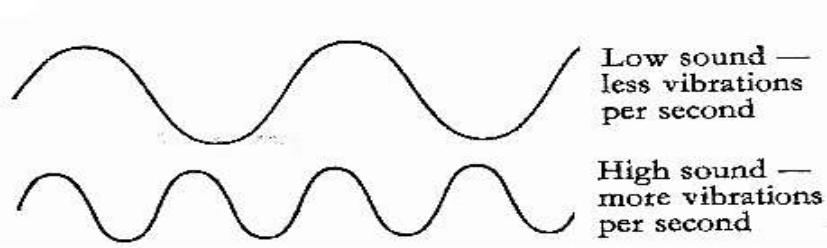

2
1
3

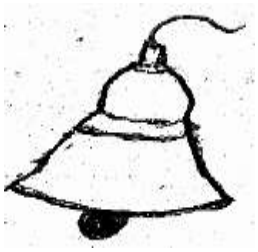


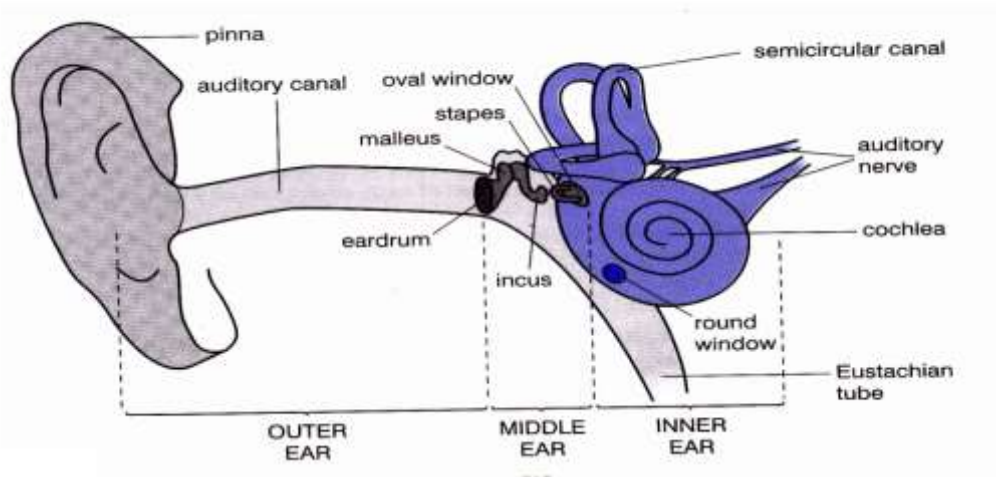


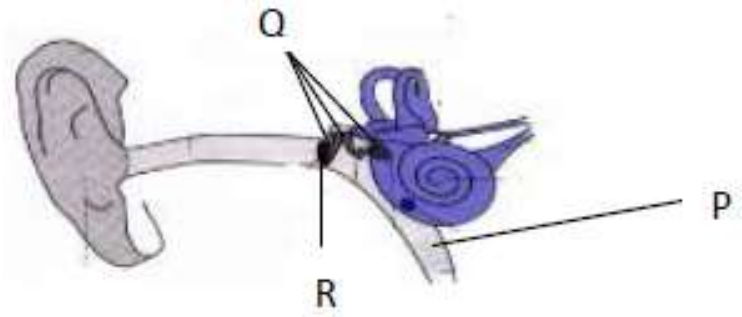


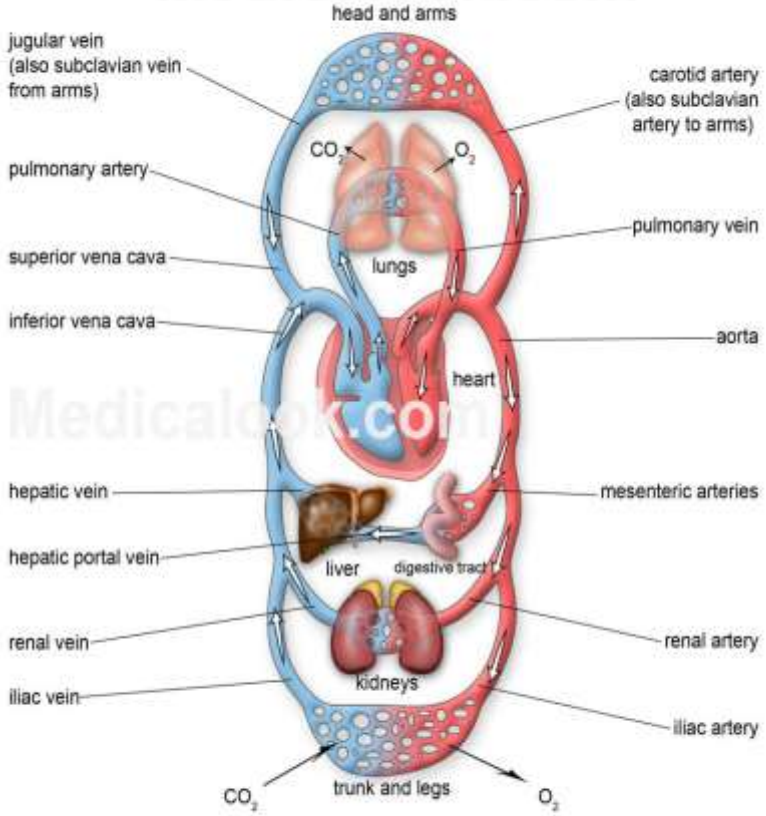

A
B
C

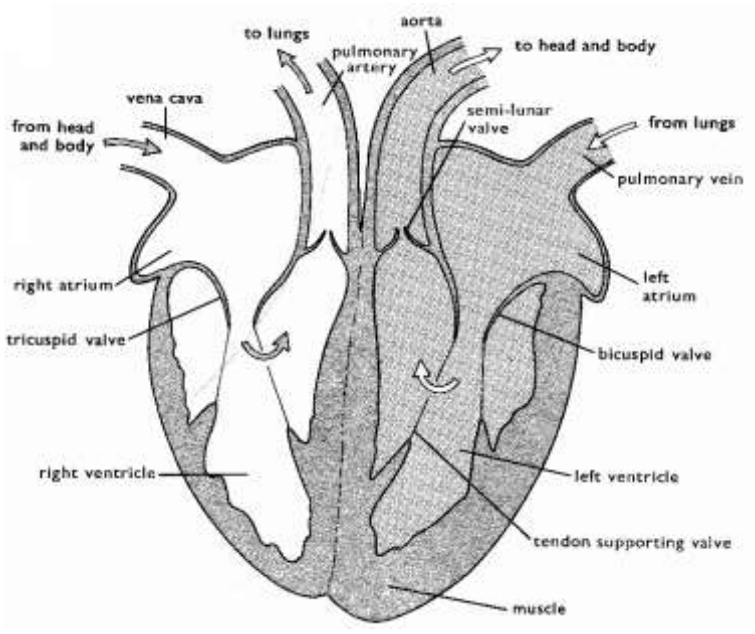

Low sound — less vibrations per second
High sound — more vibrations per second

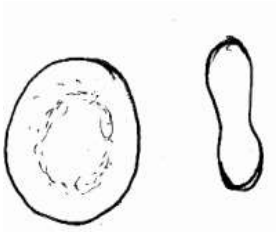


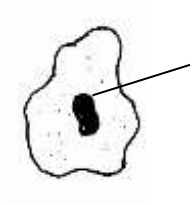

pinna
auditory canal
oval window
stapes
malleus
semicircular canal
auditory nerve
cochlea
eardrum
incus
round window
Eustachian tube
OUTER EAR
MIDDLE EAR
INNER EAR

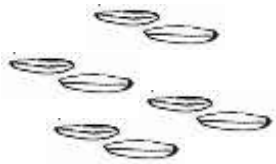

Q
P
R

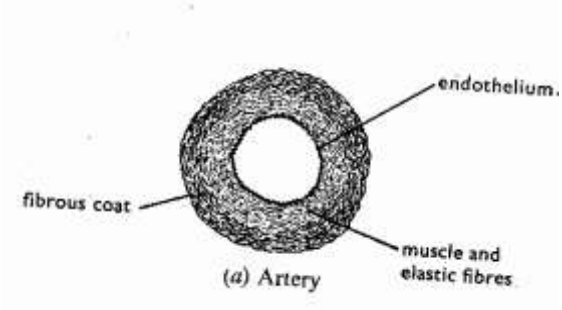

head and arms
jugular vein
(also subclavian vein
from arms)
carotid artery
(also subclavian
artery to arms)
CO_2
O_2
pulmonary artery
pulmonary vein
superior vena cava
lungs
inferior vena cava
aorta
heart
hepatic vein
mesenteric arteries
hepatic portal vein
liver
digestive tract
renal vein
renal artery
kidneys
iliac vein
iliac artery
CO_2
trunk and legs
O_2


to lungs
aorta
pulmonary artery
to head and body
vena cava
from head and body
semi-lunar valve
from lungs
pulmonary vein
right atrium
left atrium
tricuspid valve
bicuspid valve
right ventricle
left ventricle
tendon supporting valve
muscle

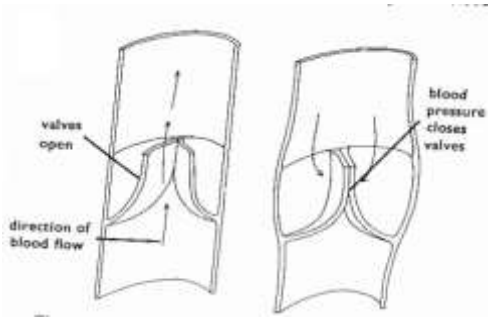


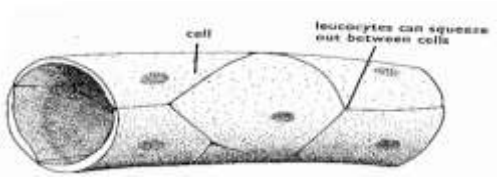


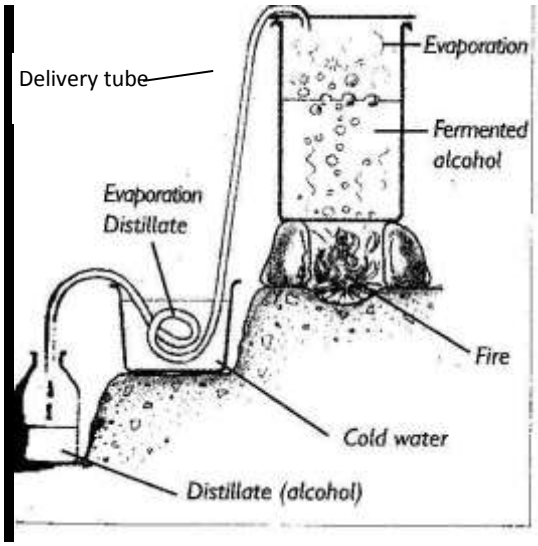




(a) Artery


valves
open
direction of
blood flow
blood
pressure
closes
valves


cell
leucocytes can squeeze
out between cells


Delivery tube
Evaporation
Fermented alcohol
Evaporation Distillate
Fire
Cold water
Distillate (alcohol)