

PRIMARY SIX SCIENCE TERM I TOPICAL BREAKDOWN

THEME: WORLD OF LIVING THINGS.

TOPIC : CLASSIFICATION OF ANIMALS.

SUB-TOPIC: VERTEBRATES

- Birds
- Mammals
- Fish
- Amphibians

INVERTEBRATES

- Arthropods
- Mollusks
- Coelenterates
- Echinoderms
- Worms

THEME: MATTER AND ENERGY

Topic : Sound Energy

Sub-topic: Sources of sound

- Music Instruments
- Speed of sound
- Properties of sound
- Mammalian ear

THEME: HUMAN BODY

TOPIC : CIRCULATORY SYSTEM

SUB-TOPIC: THE MAMMALIAN HEART

- Blood.
- Blood vessels.
- Diseases of the circulatory system.

THEME: HUMAN HEALTH

TOPIC : DRUGS IN THE SOCIETY

- Alcohol.
- Smoking.
- Essential drugs.
- Drugs of dependency.

THEME: WORLD OF LIVING THINGS

TOPIC : CLASSIFICATION OF ANIMALS

LESSON I

DATE: _____

SPELLING EXERCISE

- i) _____
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- iii) _____
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CLASSIFICATION OF VERTEBRATES.

- ❖ Classification means grouping of organisms according to their characteristics.
- ❖ **Basic characteristics of living things are:**
 1. They feed.
 2. They grow.
 3. They excrete.
 4. They respire.
 5. They reproduce.
 6. They respond to stimuli.
 7. They move/locomote.

GROUPS OF ANIMALS:

- ❖ Animals in the environment are grouped into **vertebrates** and **invertebrates**.
- ❖ 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 into five groups namely,

- Birds
- Mammals
- Reptiles
- Fish
- Amphibians

- ❖ **Warm blooded animals** are vertebrates that keep their body temperatures constant or slightly change.

They are also known as homeotherms

Examples

All birds and mammals

- ❖ **Cold blooded animals** are vertebrates that change their body temperatures according to the environment.

EXAMPLES

They are also known as poikilotherms.

Lizards, snakes, crocodiles, frogs, toads and fish

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.

- j)

- 7

6. In one sentence give a reason why animals move.

CORRECTIONS

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SPELLING EXERCISE

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SUB TOPIC: WARM BLOODED VERTEBRATES

LESSON 2 : 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.

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.

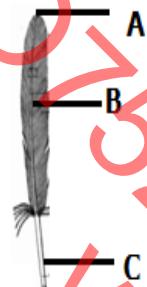
4. In one sentence give one difference between a hen and a cock

5. State the importance of feathers to a bird

6 Identify the **four** types of feathers

- i) _____
 - ii) _____
 - iii) _____
 - iv) _____

7. 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

A _____ B X C

- c) In which way is the quill feather useful to a bird?

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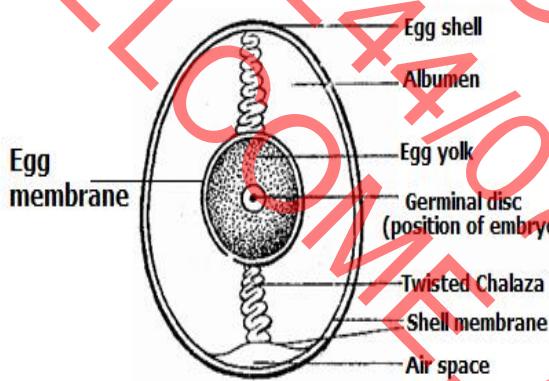
SPELLING EXERCISE

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LESSON 4: 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.

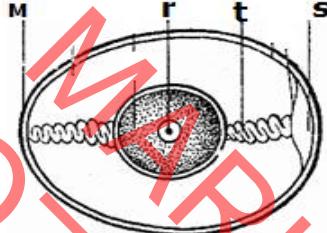
Embryo: develops into a chick under favourable conditions.

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

Chalaza; holds the Yolk and embryo in one position.

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 and T

R _____ T _____

- b) State the functions of each of the following parts

S _____

M _____

- c) What class of food is obtained from eating eggs?

3. How does poultry keeping help in the control of kwashiorkor?

4. Why is the egg shell porous?

5. Which letter on the diagram shows the part that develops into a chick?

6. Give a reason why some birds lay soft shelled eggs.

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SPELLING EXERCISE

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LESSON 5: GROUPS OF BIRDS.

- Birds of prey
- Scavengers
- Flightless/Walking birds
- Wading birds
- Swimming birds
- Perching birds
- Climbing birds
- Scratching birds

BIRDS OF PREY

CHARACTERISTICS OF BIRDS OF PREY

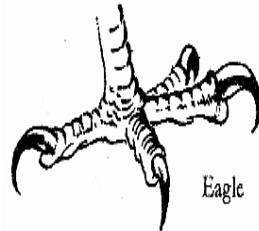
- ❖ Have strong sharp hooked beak for tearing their prey
- ❖ Have strong curved talons for easy gripping of their prey.
- ❖ Have a strong eye sight to locate their prey.

A Beak of a bird of prey



Strong, sharp and hooked beak

A foot of a bird of prey



Short curved talons for easy gripping of prey

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 and Ravens.

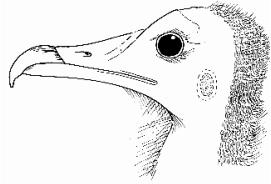
Examples of prey; smaller birds; chicks, frogs toads, tortoises/ turtles etc

Dangers of birds of prey to people

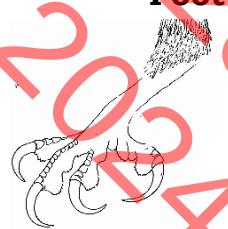
They eat people's chicks, rabbits.

DIAGRAM SHOWING A BEAK AND FOOT OF SCAVENGER BIRD

Beak



Foot



Strong, sharp and hooked beak longer sharp, curved talons which grip flesh of the remains.

Note: scavenger birds have beaks similar to the birds of prey.

Compare the beaks of a bird of prey and scavengers.

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.
6. Why do birds of prey lack a crop?

CORRECTIONS

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SPELLING EXERCISE

- i) _____
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LESSON 6: PERCHING BIRDS:

These are birds that perch on branches of trees.

Have one toe pointing backwards and three toes pointing forward

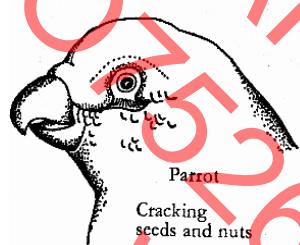
Note: Perching birds are grouped according to their habits and feeding.

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



Parrot
Cracking seeds and nuts

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.



Robin

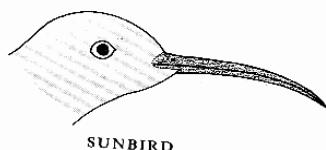


Sparrow

Content 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.



SUNBIRD

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.

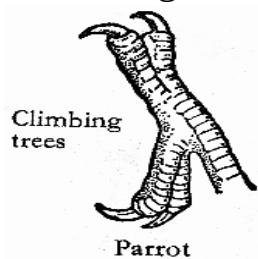
Strong foot thick toes and blunt claws Strong short pointed beak for picking up food from soil



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.

Activity

- Identify any two characteristics of the perching birds.
 - Give two ways in which perching birds are useful to a crop farmer.
 -
 -
 - In one sentence describe the following groups of perching birds:
 - Seed eaters
 - Insect eaters
 - Fruit eaters
 - Nectar suckers
 - Give any one example of a nectar sucker.
 - In one sentence describe how perching birds feed.
 - List two examples for each of the following groups of birds.
 - Scratching birds
 -
 -
 - Climbing birds.
 -
 -

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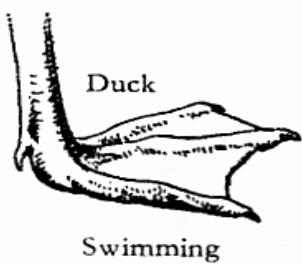
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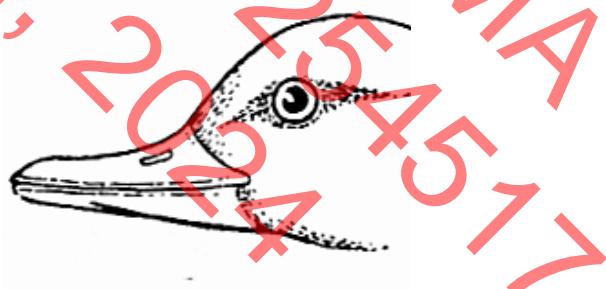
LESSON 7: Swimming birds

- ❖ These are birds with webbed feet for padding in water they swim
- ❖ Examples include, swan, duck, geese, 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.

Wading birds;

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

Wading birds have the following characteristics.

- ❖ 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.

- ❖ 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.

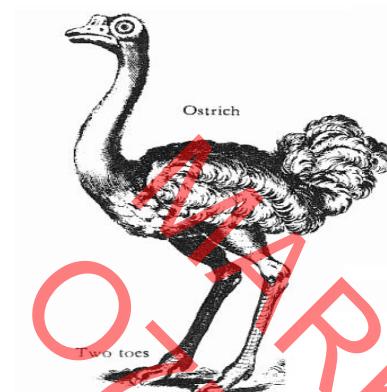
- ❖ These are birds which cannot fly but run very fast.
- ❖ Their bodies are heavier compared to the wings hence unable to fly.
- ❖ They have a lot of bone marrow hence heavier to fly in air with their weaker and smaller wings

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.

Activity

- What is meant by the term swimming birds?

- List any two examples of swimming birds

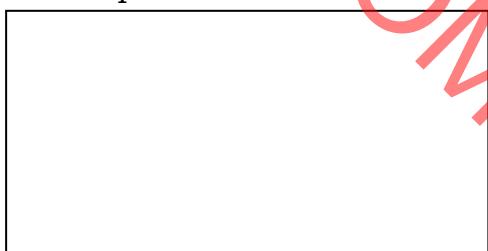
i) _____ ii) _____

- State two ways in which swimming birds are adapted to their mode of life

i) _____

ii) _____

- In the space below draw a foot of a swimming bird



- In one sentence state the meaning of the following terms:

i) Wading birds _____

ii) Flightless birds _____

- Give two examples of;

Wading birds

i) _____ ii) _____

Flightless birds

i) _____ ii) _____

7. In which one way is an emu similar to an ostrich?
8. State one characteristic that makes a crested crane able to survive in its habitat.

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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.

Activity

1) State any four ways in which birds are adapted to their mode of life.

- i) _____
- ii) _____
- iii) _____
- iv) _____

2) In four sentences state the importance of birds to people.

- i) _____
- ii) _____
- iii) _____
- iv) _____

3) Give three dangers of birds in our environment.

- i) _____
- ii) _____
- iii) _____

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iv) _____
- v) _____

Mammals;

These are warm blooded vertebrates whose skin is covered 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 advanced mammals)
- ❖ Rodents (gnawing mammals)
- ❖ Ungulates (hoofed mammals)
- ❖ Chiroptera (flying mammals)
- ❖ Monotremes (egg laying mammals)
- ❖ Carnivores (flesh eaters)
- ❖ Marsupials (pouched mammals)
- ❖ Insectivores (insect eating mammals)

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.

- 5 Explain why mammals are referred to as warm blooded vertebrates.

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
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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.

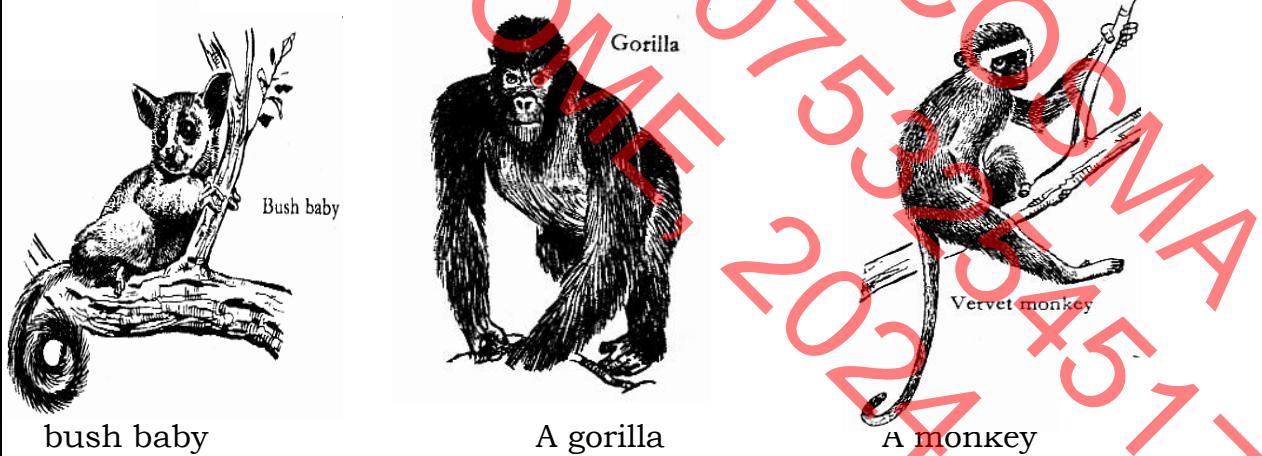
Characteristics of primates.

- ❖ 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.



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.

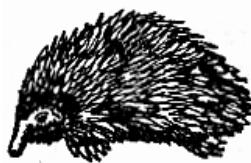
Examples of monotremes include;

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

Illustrations showing monotremes



Duck billed platypus



Spiny ant eater

Activity

- 1) What is meant by the term monotremes?

- 2) Give any two examples of monotremes.

i) _____ ii) _____

- 3) State any two reasons why primates differ from other mammals.

i) _____

ii) _____

- 4) Explain why monotremes are grouped under mammals.

- 5) In which way is duck billed platypus similar to a spiny anteater.

- 6) In which way do monotremes differ from other mammals?

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SPELLING EXERCISE

- i) _____
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LESSON 12 : Chiropters (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 chiropters.

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.



Activity

1. State any one example of a flying mammal.

2. Name the three types of bats.

i)

ii)

iii)

3. Of what importance are echoes to bats?

4. In one sentences 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.

7. How are bats different from other mammals?

8. How useful are fruit eating bats in crop husbandry?

CORRECTIONS

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SPELLING EXERCISE

- i) _____
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LESSON 13: 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, koala bear, wallabies, opossums, wombat.

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.
- ❖ Kangaroos protect themselves by kicking or fighting using their arms.

Activity

- 1) Apart from kangaroos give any two other example of pouched mammals
i) _____ ii) _____
- 2) Explain why Marsupials are called mammals.

- 3) State two ways in which marsupials are adapted to their mode of life.
i) _____
ii) _____
- 4) State any one example of a flying mammal.

- 5) Name the three types of bats.
i) _____ ii) _____ iii) _____
- 6) Of what importance are echoes to bats?

7 In one sentence state how bats are useful in our environment.

8 How can vampire bats be dangerous to animals?

9 In one sentence state a reason why bats are regarded as mammals.

10. How are bats different from other mammals?

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SUBTOPIC; VERTEBRATES (MAMMALS)

LESSON 14; FLESH EATING MAMMALS (CARNIVORES) AND SEA MAMMALS (CETACEANS)

Flesh eating mammals (carnivores)

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

Characteristics of flesh eating mammals.

- ❖ They have sharp claws for holding, killing and tearing their prey.
- ❖ They have soft pads on their 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;

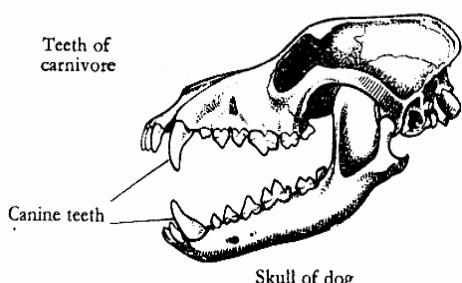
a) **Cat family**; these have features of the domestic cat.

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 e.g. hyena.

❖ Carnivores are also called preying mammals and are predators.

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

Activity

1. Explain the term carnivores.

2. A skunk is a carnivore. How does it protect itself from danger?

3. State two ways in which carnivorous animals are adapted to their mode of feeding.

- i) _____
ii) _____

4. Give any two ways in which scavengers are useful in the environment.

- i) _____
ii) _____

5. Identify a group of carnivorous animals in which the following animals belong:

- i) Leopard
ii) Domestic dog

6. State one difference benefit from staying alongside lions in grassland?

7. Why do preying mammals have soft pads in their feet?

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SPELLING EXERCISE

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LESSON 15: 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.

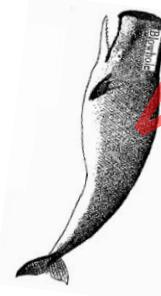
Whale, dolphins, porpoise, seals, dugongs and sea lions

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



Dolphin



Seal



Porpoise



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

Activity

1. Explain the term carnivores.

2. State two ways in which carnivorous animals are adapted to their mode of feeding.

- i) _____
- ii) _____

3. Give any two ways in which scavengers are useful in the environment.

- i) _____
- ii) _____

4. Identify a group a carnivorous animals in which the following animals belong.

- a) Leopard _____
- b) Domestic dog _____

5. State one difference between a preying mammal and a predator.

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6. In one sentence explain the meaning of the word sea mammals.

For more information about the study, please contact Dr. Michael J. Hwang at (310) 794-3000 or via email at mhwang@ucla.edu.

7. List any three examples of sea mammals.

i)

iii)

Page 1 of 1

8. Write any two characteristics of sea mammals.

i)

• 100% Natural • 100% Organic • 100% Sustainable

9. Name the largest mammal.

For more information about the study, please contact Dr. Michael J. Hwang at (319) 356-4000 or email at mhwang@uiowa.edu.

10. Of what importance is thin layer of blubber to a whale?

11. How do hyenas benefit from moving alongside lions?

A skunk is a carnivore. How does it protect itself from danger?

12. A skunk is a carnivore. How does it protect itself from danger?

~~CORRECTIONS~~

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 16: 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 vegetarians 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.



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.

5. How does each of the following animals protect itself from danger;

- a) Hedgehog

- b) rabbits

Corrections

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 17: Ungulates (hoofed mammals)

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

Characteristics of ungulates or hoofed mammals.

- ❖ They mainly feed on plant materials.
- ❖ They have toes divided into two namely.
- ❖ Even toed, ungulates e.g cow, goat, sheep. Deer, camel etc
- ❖ Odd toed ungulates e.g elephant, horse, zebra, donkey etc.
- ❖ Some ungulates are ruminant and chew cud.
- ❖ Ruminant ungulates have four chambered stomachs.
- ❖ Some ungulates do not chew cud and have one true stomach.

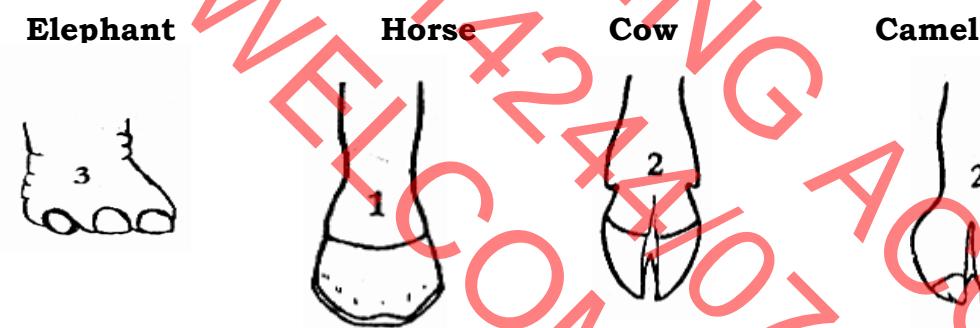
Note: cud is food an animal brings back from the stomach to chew again. This is called rumination. Ruminant animals are animals with four chambered stomachs and chew cud. e.g goats, sheep etc.

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 – Ant bear
- Porcupine – Shrew.

Things to note:

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

Activity

1. State any two characteristics of ungulates.

- i) _____
- ii) _____

2. How are odd toed ungulates different from even toed ungulates?

- _____
- _____

3. Give two examples of ruminant animals.

- i) _____
- ii) _____

3. How does a porcupine protect its self?

- _____

4. Write one sentence to explain the meaning of the word gnawing mammal.

- _____

5. List any four characteristics of gnawing mammals.

- i) _____
- ii) _____
- iii) _____
- iv) _____

6. Give three ways in which rodents are a disadvantage to a crop farmer.

- i) _____
- ii) _____
- iii) _____

7. State how rodents are adapted to their mode of feeding?

- _____
- _____

8. What are non ruminant animals?

- _____
- _____

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 18: 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 ventricle.

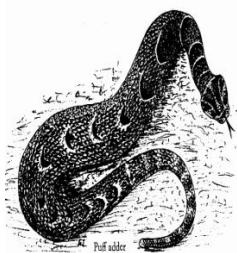
Groups of reptiles.

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.

Classification of snakes;

Snakes are grouped or classified according to their features and adaptations

There are basically three groups of snakes. These are;

- ❖ Poisonous snakes
- ❖ Non-poisonous snakes
- ❖ Constrictors.

Activity

1. In One sentence explain the term reptiles.

2. Give any two characteristics of reptiles.

i) _____

ii) _____

3. Identify any two groups of reptiles.

i) _____

ii) _____

4. How do reptiles benefit from moulting?

5. State any one structural difference between poisonous and non poisonous snakes.

6. State two similarities and differences between birds and reptiles.

a) Similarities

i) _____

ii) _____

b) Difference

i) _____

ii) _____

7. Why are reptiles called poikilothermic animals?

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 19: Poisonous and non-poisonous snakes.

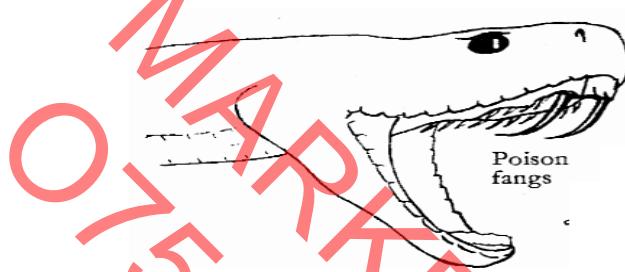
Poisonous snakes;

- ❖ These are groups of snakes with poison glands and fangs.
- ❖ They have a pair of long hollow teeth (fangs) connected to the poison glands.
- ❖ When snakes bite, they inject their poison in the bitten area of the animal.
This poison from snakes is called venom.
- ❖ Snake venom can be used to make serum used for providing treatment against snake bites.

Effect of snake poison on blood.

- ❖ Venom lowers the temperature of blood thus clotting it, once clotted, the part affected is cut off (amputated).

Diagram show a head of a poisonous snake



Note: each type of a poisonous snake has different types of venom.

Some snakes have their poison gland situated at the back on the mouth with others near the front part of the mouth.

First aid for snake bites.

- ❖ Calm the casualty
- ❖ Identify the fang marks.
- ❖ Tie slightly above the bitten part.
- ❖ Take the casualty to the nearest health unit.

Examples of poisonous snakes.

Cobra, black mamba, puff udder, Gabon viper

Non-poisonous snakes.

- ❖ These are groups of snakes with fangs with no venom.
- ❖ They kill their prey by suffocating them to death

Examples; Green snakes, brown house snake.

Note; Non-poisonous snakes help to feed on other organisms such as frogs, rats and mice.

- ❖ Constrictors are snakes with developed fangs.
- ❖ They kill their prey by crushing and suffocating them.
- ❖ They lick their prey making it slippery for easy swallowing.

Examples include; pythons, anaconda, boa.

Note: the jaws of a snake are specially constructed to enable them to swallow their prey much larger than their width.

ACTIVITY

1. How does a poisonous snake differ from non poisonous snake?

2. State any three characteristics of poisonous snakes.

i)

ii)

iii)

3. Give two examples of poisonous snakes.

i)

ii)

4. How does venom affect blood?

5. What first aid would you give to a P.2 boy who has been bitten by a snake?

6. Of what importance is venom to people?

7. How can you identify a person who has been bitten by a poisonous snake?

CORRECTIONS

DATE: _____

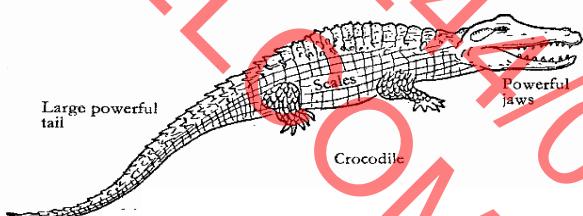
SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 20: CROCODILES AND ALLIGATORS.

- ❖ Crocodiles are the largest reptiles.
- ❖ They are very lazy and lethargic.
- ❖ They have a long strong jaw for feeding on some aquatic animals.
- ❖ They have a long powerful tail for swimming and attacking their prey.
- ❖ The female lay hard-shelled eggs in sand or mud.
- ❖ Alligators have similar features to the crocodiles however, they live in big waters.

An illustration showing a crocodile.

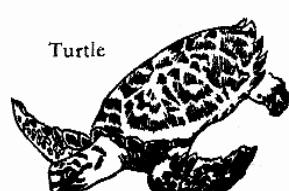
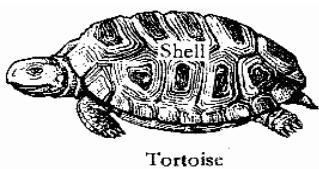


Tortoises and Turtles/Terrapins.

Tortoises are reptiles enclosed in a complete hard shell made of bony plates.

- ❖ They do not have teeth but have sharp cutting edges for proper digestion of their food.
- ❖ They withdraw and hide in their hard shell incase of danger.
- ❖ Turtles have flippers for easy swimming in water
- ❖ All tortoises/terrapins and turtles use lungs for breathing.
- ❖ They reproduce by means of laying eggs commonly laid in sand.
- ❖ Tortoises commonly live on land while turtles live in muddy waters.

Structure showing a tortoise and a turtle.



A tortoise with hard shell Turtle with flipper for swimming

Note; some tortoise eat plants while others eat small insects.

ACTIVITY

1. Identify any one habitat for crocodiles.

2. State any two characteristics of crocodiles

i)

ii)

3. How are crocodiles and alligators adapted to swimming?

4. In two sentences, state how a tortoise is adapted to its mode of life.

5. State how reptiles reproduce.

6. How does a tortoise protect itself from danger?

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 21. Lizards and chameleons

Lizards have two pairs of limbs i.e. front and hind limbs for movements.

Groups of lizards include:

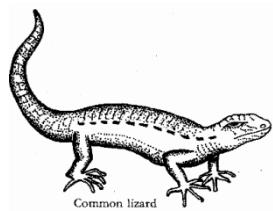
Common lizards, geckoes and chameleons.

Characteristics of lizards.

- ❖ They have a fleshy forked tongue for easy trapping of their prey.
- ❖ They have movable eye lids.
- ❖ They moult to grow new skins and increase in size.
- ❖ Geckoes are commonly found in houses and move up side down the ceilings.
- ❖ They have suction pads on their feet to enable them walk upside down the ceilings.
- ❖ A chameleon has building eyes close to the top of its head to see in all directions back, sideways and forward)
- ❖ Chameleons feed on insects such as mosquitoes, house flies using its sticky forked tongue.
- ❖ Chameleons camouflage to protect themselves from enemies and easy location of their food.

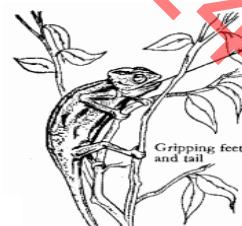
Diagrams of a common lizard and chameleon

Common Lizard



Common lizard

Chameleon



Chameleon catching its food

Importance of reptiles.

- ❖ Some reptiles are sources of food to some people.
 - ❖ Snakes provide skins for making leather.
 - ❖ Reptiles attract tourists from other foreign countries.
 - ❖ Reptiles help to eat harmful insects in the environment.

ACTIVITY

- ~~MARKETING ACTIVITIES~~

 1. List two examples of lizards.
 - i) _____
 - ii) _____
 2. In four sentences, explain how lizards are adapted to their mode of life.
 - i) _____
 - ii) _____
 - iii) _____
 - iv) _____
 3. State how a chameleon protects its self against danger.

 4. State how geckoes are adapted to moving upside down the ceilings.

 5. Give any two importance f reptiles to people.
 - i) _____
 - ii) _____
 6. How are chameleons important in the control of malaria?

~~CORRECTIONS~~

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 22: Amphibians;

- ❖ Are cold blooded vertebrates that live both on land and in water.
- ❖ Amphibians are adapted for early life on water and later life on land.

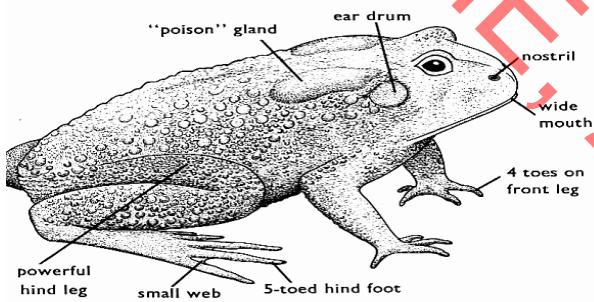
Examples of amphibians.

These include toads, newts, frogs and salamander.

Characteristics of amphibians.

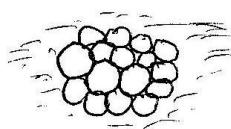
- ❖ On land they use lungs while in water they use moist skin to breathe.
- ❖ They live both on land and in water.
- ❖ All amphibians are cold blooded animals (poikilothermic)
- ❖ They reproduce by means of laying eggs fertilized externally.
- ❖ They have webbed feet for easy swimming in water.
- ❖ Their young ones called tadpole have a tail and breathe through external gills like fish.
- ❖ A newt and a salamander have tails compared to a frog and a toad.
- ❖ They have back bones.

A structure showing external features of a toad.

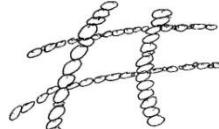


Differences between a frog and a toad

Frog



Toad



Frog: Lay eggs in big masses (cluster) batches

Toad: Lay eggs in a double ribbon like structure called spawn.

Frog: Breathes through their moist skin and the lungs

Toad: Breathes through lungs only

Frog: Commonly live in water at late stages.

Toad: Commonly live in water at early stages and on land at late stages.

Frog: Have long flexible hind legs to make long jumps

Toad: Have short hind legs and make short jumps

A frog: Has a smooth shiny skin with no poison glands.

A toad: Has a rough warty skin with poison glands

ACTIVITY

1. In one sentence, explain the term amphibian.

2. Give two examples of amphibians.

i) _____ ii) _____

3. State two characteristics of amphibians.

i) _____
ii) _____

4. State any three differences between a frog and a toad.

i) _____
ii) _____
iii) _____

5. How is a newt similar to the salamander?

6. Why is a frog able to live both on land and in water?

7. How are the eggs of amphibians protected from predation?

8. Give two similarities and differences between reptiles and amphibians.

a) Similarities

i) _____
ii) _____

b) Differences

i) _____
ii) _____

CORRECTIONS.

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 23. How amphibians respire.

- ❖ A frog breathes through its moist skin and mouth cavity in water and lungs for breathing on land.
- ❖ A frog keeps its skin moist by secretions from the mucus glands.
- ❖ A toad also uses lungs and mouth cavity for breathing.
- ❖ Amphibians do not have diaphragms and ribs.
- ❖ A tadpole uses external gills for breathing.

Movement;

- ❖ The hind limbs of amphibians are used for crawling and leaping.
- ❖ The front legs of amphibians are used for absorbing pressure of the shock of landing.

Feeding;

- ❖ Adult frogs and toads are carnivorous as they feed on worms, beetles, cockroaches, houseflies and other insects.
- ❖ Sometimes toads and frogs leap towards an insect and trap it using their sticky tongues.
- ❖ A tadpole is herbivorous and feeds on plants in water.

Note: Toads and frogs hibernate, a state when the body activities are slowed down e.g feeding. This is also called **Aestivation**.

Adaptations of a frog to living in water.

- ❖ Frogs have streamlined bodies to enable them move easily in water.
- ❖ Frogs have fully webbed hind feet for swimming in water.
- ❖ Frogs use their skins and mouth cavity for breathing while in water.
- ❖ Frogs can close nostrils when under water to prevent water from entering into the body.

ACTIVITY

1. In one sentence, state how amphibians respire

2. How are the hind limbs of amphibians adapted for movement?

3. State how the following amphibians obtain food.

- i). adult frogs and toads _____
- ii). Tadpoles _____

4. In a sentence, explain the term aestivation.

5. In three sentences, state how a frog is adapted to living in water.

- i) _____
- ii) _____
- iii) _____

6. How does a frog differ from a toad in terms of protection?

7. In which way is a tadpole similar to a fish?

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SPELLING EXERCISE

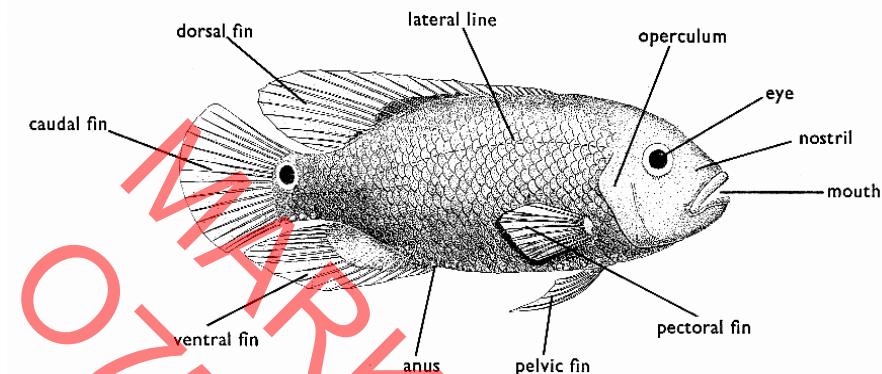
- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 24: Fish.

Characteristics of fish;

- ❖ They reproduce by means of laying eggs fertilized externally on water.
- ❖ They use their fins for swimming in water.
- ❖ They are cold blooded vertebrates and breathe in dissolved oxygen in water using gills.
- ❖ A young fish is called a **fry**.

An illustration showing the external parts of a fish.



Functions of the parts.

Scales - covers the body of the fish.

Gill cover - Protect the gills from external damage. Its also called operculum

Nostril – for smelling and tasting food.

Tail fin – For steering on swimming or changing directions.

- It's also called the caudal fin.

Dorsal fin – for protection against predators/defence.

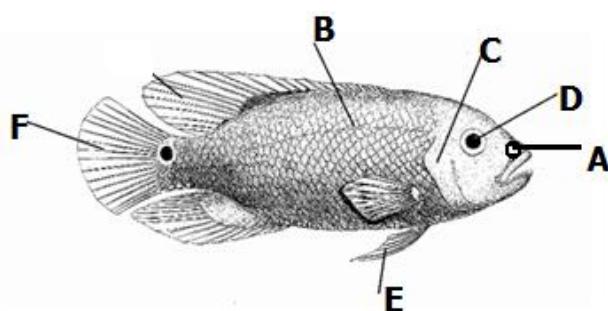
Pectoral and pelvic fins. – For slowing down or stopping or act as brakes during swimming.

Mouth; is a passage of food and water with dissolved oxygen to the gills.

Lateral line – detects sound waves in water.

Activity

1. Below is a diagram of a fish. Use it to answer the questions that follow;



- a) Name part B , C, D.

A_____ B_____ C_____

- b) State the functions of parts marked F, A and B.

F _____

A

B _____

2. What name is given to the young fish?

State the type of fertilization that occurs in fish.

4. Give two examples of paired fins.

i)

iii) $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

5. Which part on the above diagram plays the same role as ears of a goat?

6. Cite two ways how a fish protects itself from danger.

i) _____

ii) _____

~~CORRECTIONS~~

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 25: TYPES OF FISH.

There are basically three types of fish namely;

- ❖ Lung fish.
- ❖ Bony fish.
- ❖ Cartilaginous fish.

Bony fish.

These are fishes with a bony skeleton and covered with overlapping scales.

Examples include;

Tilapia, nile perch, herrings, Salmon fish.

Cartilaginous fish

These are fish with no true bones but just soft bones called the cartilage.

They do not have a swim bladder and gill covers.

Examples of cartilaginous fish are;

Shark, dog fish, rays, skates.

Lung fish;

These are fish commonly found in dirty waters of pools, Swamps and rivers.

The commonly hibernate during the dry season and continue living in wet season.

Examples of lung fish include;

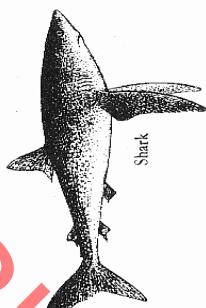
Emmamba, epiceratodus, are the common examples of lung fish.

Diagrams showing different types of fish

Bony fish



Cartilaginous fish



Lung fish



Reproduction in fish.

- ❖ Female fish lay eggs in shallow water where the male sheds sperm over them.
- ❖ Fish undergo external fertilization.

Many eggs are laid but only a few hatch and develop into adults.

Note: most fish do not take care of their young ones except the tilapia fish.

ACTIVITY

1. Identify any two types of fish

i) _____
ii) _____

2. How does a fish reproduce?

3. Give two examples of cartilaginous fish.

i) _____
ii) _____

4. Which fish cares for its young ones?

5. State one difference between a bony fish and a cartilaginous fish.

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 26: Breathing of the fish.

- Fish breathe in dissolved oxygen using gills.
- Dissolved oxygen in water is allowed to enter through the mouth cavity and trapped by the gill filament.
- Gill rakes help to trap any foreign body that enters with water to avoid damaging the filaments.
- Gill bar helps to hold the gill filament.
- Gaseous exchange takes place in the gill filament.

- A fish has a number of gill filaments to increase the surface area for respiration (intake of oxygen).

Note: A fish will die shortly in case it is removed from water due to lack of dissolved oxygen.

An illustration showing parts of the gills.



Adaptations of the fish to living in water.

- ❖ Fish use gills for breathing.
- ❖ They are streamlined for easily swimming in water.
- ❖ Fish use swim bladder for buoyancy in water.
- ❖ Some fish are slippery to escape easily from their enemies.
- ❖ Fish have lateral line to detect sound waves in water.
- ❖ They have fins for easy swimming in water.

ACTIVITY

1. State how a fish breathe.

2. In the space below, draw a structure of a gill and name the following parts;
- gill raker.

b) gill bar

c) gill filament

3. State any two ways how a fish is adapted to living in aquatic environment.

i)

ii)

4. How is a swim bladder useful to a bony fish?

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 27: Invertebrates;

- ❖ These are animals with no back bone or vertebral column/spine.
- ❖ Most have got an exo-skeleton and do moult.

Groups of invertebrates

These are basically six groups of invertebrates namely;
Coelenterates, molluscs, Echinoderms and sponges, worms and Arthropods.

Coelenterates.

- ❖ These are stinging animals with one body opening.
- ❖ Their opening works as both the mouth and Anus surrounded by tentacles.

Examples of coelenterates includes;

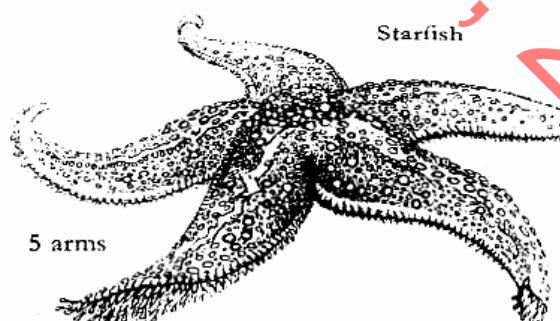
Hydra, jelly fish, sea anemones and corals

Echinoderms and sponges

- ❖ These are animals which live in seas.

Examples include, star fish, sea urchin and sea cucumbers, Brittle stars.

An illustration showing a star fish



- ❖ Sponges also live in fresh water and commonly live in colonies.
- ❖ They breathe and feed through many holes on their bodies.
- ❖ Food and oxygen are absorbed as water flows through their holes on the body.

ACTIVITY

1. Explain the term invertebrates in one sentence.

2. Identify any two groups of invertebrates

- i)
- ii)

3. Give two examples of each group of invertebrates in (2) above.

- i)
- ii)

4. What characteristic is shared by all invertebrates?

5. How does a star fish obtain its food?

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 28: Molluscs;

These are invertebrates which are soft bodied and usually protected by a shell.

They live in shells in seas and other fresh water bodies. Some of them live on land.

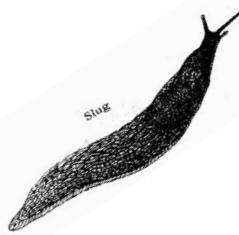
Examples of molluscs.

Oyster, octopus, cuttlefish, garden snail, water snail, slugs, squids.

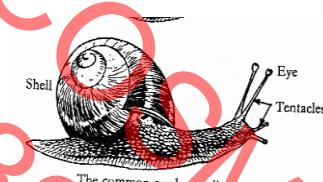
- ❖ The garden snail and slugs live on land.
- ❖ They have tentacles for detecting sound, smell and temperature.
- ❖ Sea molluscs have gills for breathing while land molluscs use simple lungs.

Illustrations showing different examples of molluscs

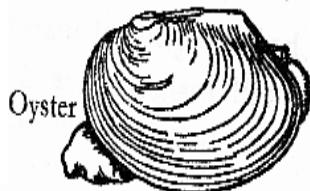
Slug



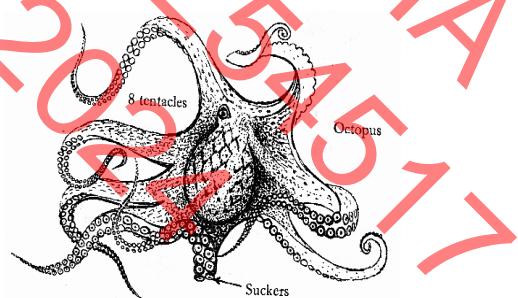
Garden snail



Oyster



Octopus



Dangers of molluscs to people.

- ❖ Fresh water molluscs are vectors to people.
- ❖ They spread worms that cause bilharziasis.
- ❖ This worm is called schistosome.

ACTIVITY

1. State what is meant by the term mollusks.

2. Write any three examples of molluscs

i) _____
ii) _____
iii) 

3. State two ways in which some molluscs are dangerous to human health.

i) _____
ii) Q, R

4. Draw and name parts of a garden snail.

5. Draw any one invertebrate with a shell on its body.

~~CORRECTIONS~~

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 29: Worms;

- ❖ These are long thin and soft bodied invertebrates.
- ❖ They use their moist skins for breathing.
- ❖ They have hydrostatic type of skeleton.

Categories of worms

Worms are grouped into three major groups namely:

- segmented worm (annelids)
- round worms (nematodes)
- flat worms.

Segmented worm:

These are worms with segmented bodies or rings. They mostly live in moist places.

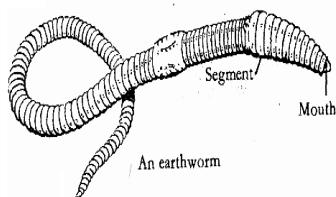
Examples of segmented worms include:

An earthworm, bristle worm and leech.

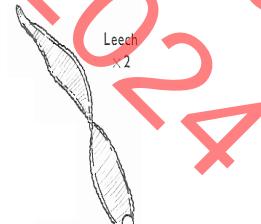
Earth worms feed on plant materials.

Below are diagrams showing an earthworm and a leech

earthworm



leech



Note; An earthworm is a hermaphrodite. i.e have both female and male reproductive organs.

- ❖ Earth worms help in aeration of soil as they make channels in the soil.

- ❖ Earth worms come out of the soil when it has rained to breath in oxygen.
 - ❖ Earth worms also soften the soil.
 - ❖ Their excreta help in the formation of humus sub-groups

How earthworms move.

~~Earth worm move by contraction of their body muscles.~~

ACTIVITY

- ## 1. What are segmented worms?

25% off

2. Give two examples of segmented worms.

i) $\frac{1}{2}x^2 + 3x - 2$
ii) $x^2 - 4x + 4$

3. Identify any other two groups of worms apart from segmented worms.

i) _____

4. Why do earth worms come out of the soil when it has rained?

—
—
—

5. State the importance of earth worms to a farmer.

CORRECTIONS

A red ink stamp is positioned diagonally across the page. The stamp contains the year "2024" in a large, bold, sans-serif font, with the "2" partially cut off on the left edge. To the right of "2024" is the number "11", also in a bold, sans-serif font. The entire stamp is tilted approximately 45 degrees clockwise from the top-left corner towards the bottom-right corner.

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

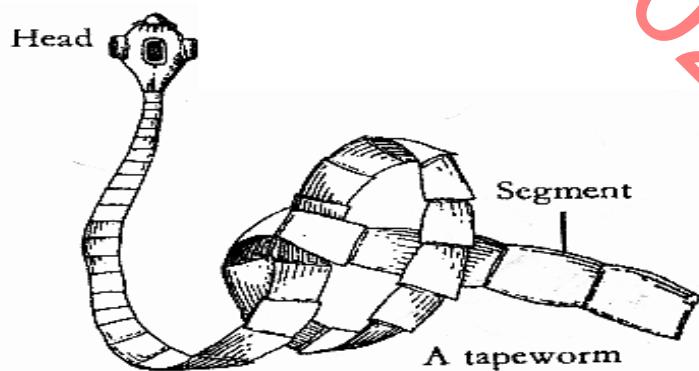
LESSON 30: Flat worms:

- ❖ These are worms with flattened and segmented bodies made up of three layers.
- ❖ They are parasites to animals and live in the animals' intestine.
- ❖ They feed on animals digested food.

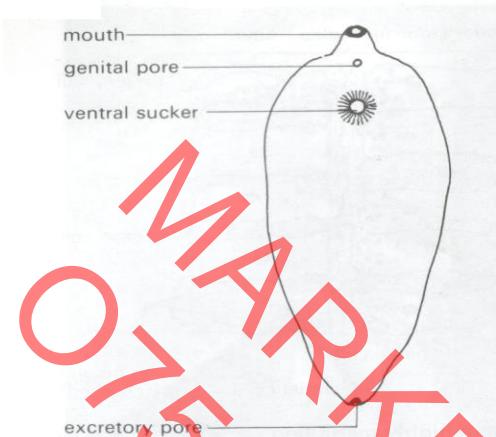
Examples of flat worms.

- ❖ Tape worm, liver flukes.
- ❖ tape worms live in the small intestines in animals and feed on the digested food
- ❖ They have the hooks to attach themselves on the walls of the stomach.
- ❖ They have the suckers for sucking digested food from the stomach walls.
- ❖ Their bodies are covered with mucus to prevent themselves from hot substances sent to the stomach.
- ❖ Liver flukes are paper like and live in the liver of the affected animal causing damage to it.

a) Diagram showing parts of a tape worm.



b) Diagram of a liver fluke.



ACTIVITY

1. List two examples of flat worms
i) _____
ii) _____
2. How do tape worms enter into our bodies?

3. State the dangers of having tape worms in our bodies.

4. Give any one way of avoiding tape worm infestation.

5. Draw and name parts of a tape worm (i.e. segment, Suckers, hooks).

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON31: Round worms

- These are groups of worms with a cylindrical body.
- They are also parasites to animals and people.
- Some live in water and others in soil.
- The commonest type of round worms lives in animal's small intestine and usually seen through faeces of infected animals.

Examples of round worms

- hook worms
- pin worms
- guinea worms
- ascaris worms
- filarial worms
- eel worms
- Thread worms.

How hook worms enter our body?

- By penetrating through soles of our feet when we walk bare-footed, especially in dirty places.
- They enter through the skin and stay in the small intestine sucking blood.
- As they suck blood, they cause anaemia to the host.

A diagram of a hookworm



Dangers of worms to people

- ❖ They suck blood hence causing anaemia.

Ways of preventing hook worm infection

- ❖ By wearing scandals/shoes when visiting dump places such as latrines.
- ❖ By washing hands after visiting a latrine.
- ❖ By washing fruits before eating them in raw form.
- ❖ Through proper disposal of human wastes.

LEARNER'S ACTIVITY

1. Outline two characteristics of hook worms

- _____
- _____

2. List any two examples of hook worms

- _____
- _____

3. Mention two ways by which hook worms enter into our bodies

- _____
- _____

4. State any one way in which worms are dangerous to people.

5. State any three ways of preventing hook worm infection.

- _____
- _____
- _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 32: Single celled organisms:

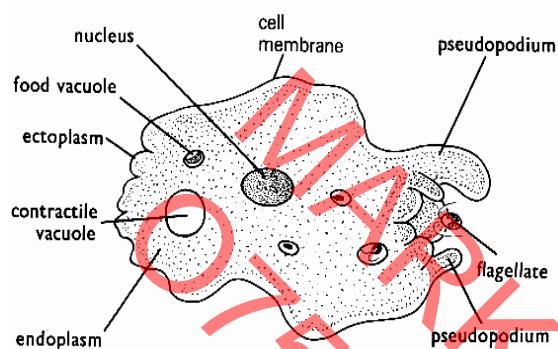
- ❖ These are very tiny (microscopic) animals whose bodies are made up of a cell-membrane, cytoplasm and a nucleus.
- ❖ They are also known as unicellular organisms.
- ❖ Such single-celled animals are called protozoa.
- ❖ Many of them are found living in ponds, ditches, seas, lakes, rivers and inside bodies of other animals.
- ❖ They are too small to seen by our naked eyes. Therefore they are observed through an instrument called microscope.

Examples of Single-Celled organisms

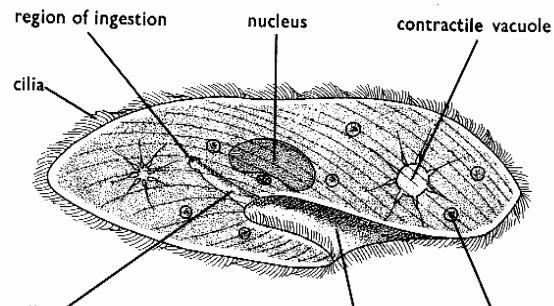
- Amoeba
- paramecium
- plasmodia
- Chlamydia
- trypanosomes
- Schistosomes etc.

Structures of an Amoeba and Paramecium

amoeba



paramecium



Characteristics of an amoeba.

- ❖ They live in water to protect them against drying up.
- ❖ They reproduce by cell-division.
- ❖ They feed by engulfing food particles.
- ❖ They move by means of pseudopodia (false legs).
- ❖ They are single-celled-unicellular in nature.

Characteristic of a Paramecium.

- ❖ It is a unicellular organism.
- ❖ It has a nucleus, cell membrane and cytoplasm.
- ❖ It moves by means of cilia.
- ❖ It also reproduces by cell-division.
- ❖ Its body is covered by cilia.

Dangers of Protozoa.

- ❖ Most protozoa cause diseases to people. e.g.
- ❖ Amoeba- amoebic dysentery.
- ❖ plasmodia- malaria
- ❖ Chlamydia- bilharzias
- ❖ Trypanosomes- sleeping sickness to people and nagana to live stock.

LEARNER'S ACTIVITY

1. In one sentence, explain the term single celled organism.

2. Name any three examples of single celled animals.

- i) _____
- ii) _____
- iii) _____

3. How does an amoeba obtain its food?

4. Draw the structure of an amoeba and name the parts; nucleus, pseudopodium and cell membrane.

5. State any one way in which protozoa are dangerous to people.

Corrections

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 33: Arthropods:

These are animals with jointed legs and segmented bodies.

- ❖ Their bodies are covered with an exo-skeleton.
- ❖ The exo skeleton controls their growth and size.
- ❖ Arthropods do moult to remove their exo-skeleton in order to grow a new one and increase in size.

Sub groups of arthropods.

Arthropods are sub divided into four sub groups. myriapods, arachnids, crustaceans, insects.

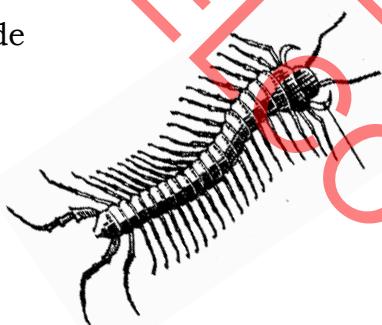
Myriapods;

Myriapods are arthropods with many jointed legs with an exo-skeleton.

Examples of myriapods include millipedes and centipedes.

Diagram showing a centipede and millipede.

Centipede



Millipede



- ❖ A centipede has one pair of jointed legs on each segment.
- ❖ A centipede is a carnivore and feeds on insects and other small worms.
- ❖ A centipede has poison glands which produce poison used to inject in its prey and for protection.
- ❖ A millipede is a herbivore and makes holes in soil hence helping in soil aeration.
- ❖ A millipede protects itself from enemies by curving up into a ball like structure/by coiling.
- ❖ Some small millipedes produce a smelly fluid for protection.
- ❖ They also roll on their backs when disturbed to scare their enemies

Similarities between centipedes and millipedes

- ❖ Both have jointed legs on each segment
- ❖ Both have an exoskeleton
- ❖ Both roll on their backs when disturbed to scare their enemies

Differences between centipedes and millipedes

- ❖ A centipede is a carnivore while a millipede is a herbivore
- ❖ Unlike a centipede a millipede has more legs
- ❖ A centipede has poison glands for protection while a millipede protects itself by coiling

LEARNERS' ACTIVITY

1. What are arthropods?

2. Mention four different groups of arthropods.
i) _____
ii) _____
iii) _____
iv) _____
3. List any two characteristics of arthropods
i) _____
ii) _____
4. In two sentences, state how a centipede is similar to a millipede
i) _____
ii) _____
5. How does a millipede protect itself from enemies

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 34: Arachnids

- ❖ These are arthropods which have four pairs of legs.

Characteristics of arachnids.

- ❖ Have no antennae.
- ❖ Have two main body parts (head and abdomen).
- ❖ Have four pairs of legs – eight legs.
- ❖ Have a simple eye and also compound eyes.

Examples of arachnids include

Ticks, scorpions and spiders.

Spiders

- ❖ Spiders are commonly seen on walls of houses.
- ❖ They use book lungs for breathing
- ❖ They make webs for their nests and also for trapping prey.
- ❖ Spiders are carnivorous, trap small insects and suck their fluids for food.
- ❖ The males also use the web to trap the females for mating.

Reasons why spiders are not classified as insects.

- ❖ They have two main body parts instead of three
- ❖ Spiders have four pairs of jointed legs instead of three.
- ❖ Spiders use book lungs for breathing while insects use spiracles.

Scorpion

- ❖ A scorpion has a large tail with poison which it injects into its enemies after stinging them.
- ❖ A scorpion produces live young ones.

Ticks

Ticks suck blood from animals hence spreading tick borne diseases to animals.

Examples of tick borne disease include:

East coast fever, red water, heart water, anaplasmosis.

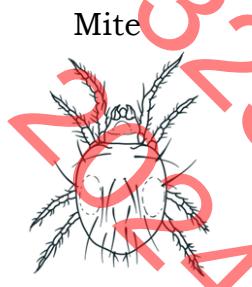
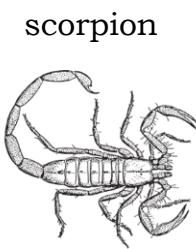
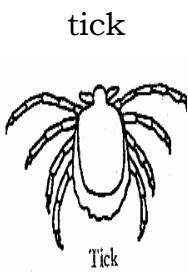
They are all caused by protozoa spread by ticks to cattle.

Note:

Tick borne diseases can be controlled on the farm by:

- ❖ Dipping and spraying the animals with acaricides.
- ❖ Grazing animals on new pasture.
- ❖ By double fencing (best method).

Drawn structures showing a tick, spider, scorpion and a mite.



LEARNER'S ACTIVITY

1. What are arachnids?

2. List any two characteristics of arachnids.

i) _____ ii) _____

3. Give two reasons why spiders are not classified as insects

i) _____
ii) _____

4. Give two examples of tick borne diseases

i) _____
ii) _____

5. In two sentences, state how a farmer can control spread of tick borne diseases on a farm.

i) _____
ii) _____

Corrections

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 35: Insects

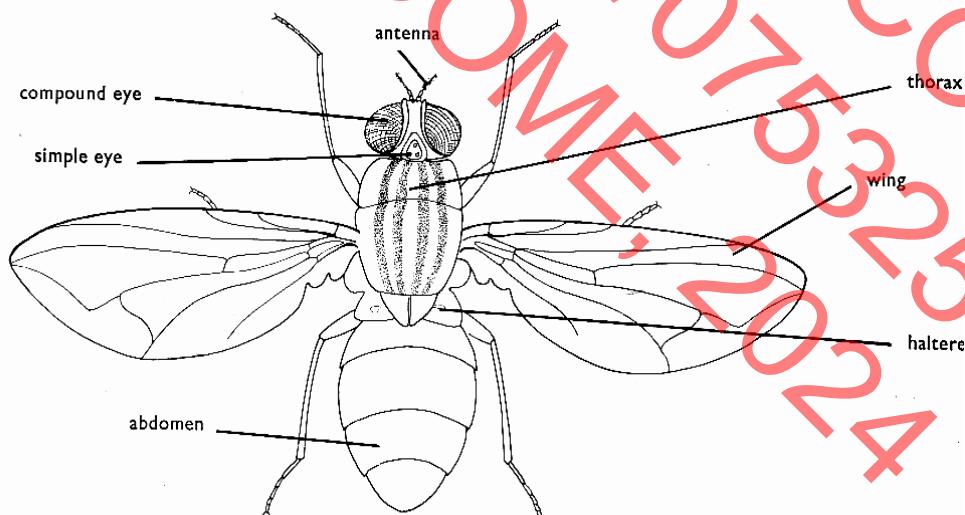
Characteristics of insects.

- ❖ These are arthropods with three main body parts.
- ❖ They have three pairs of joined legs
- ❖ Insects breathe through organs called spiracles located on their abdomen.
- ❖ Have one pair of antennae/feelers
- ❖ Insects have an exo-skeleton and do moult.

Examples of insects:

Houseflies, tsetse flies, dragon flies, grasshoppers, cockroaches, moth, bees etc

External parts of a housefly.



Function of the above parts.

- a) **Compound eyes:** used for vision or sight.
- b) **Antennae:** for smelling and feeling.
- c) **Proboscis:** for sucking food or fluids.
- d) **Mandibles:** for chewing its food.

- e) **Wings**: for flying.
- f) **Halteres**: for balancing in air while flying.
- g) **Spiracles**: for gaseous exchange/breathing.

Importance of the thorax to the insect

- ❖ Provides attachment of wings.
- ❖ Is where wings and jointed legs are attached
- ❖ Has halteres used by the insect to balance in air during flight.

LEARNER'S ACTIVITY

1. List down four characteristics of insects
 - i) _____
 - ii) _____
 - iii) _____
2. State the function of the following parts of an insect;
 - i]. antennae _____
 - ii]. Spiracles _____
 - iii]. Halters _____
3. In the space below, show the life cycle of a house fly (diagram)
4. What name is given to the larva of a mosquito?
5. Explain the following terms;
 - i]. metamorphosis _____
 - ii]. Moulting _____
 - iii]. Incomplete metamorphosis _____

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 36: Reproduction in insects

- ❖ Most insects reproduce by means of laying eggs.
- ❖ There are basically two types of metamorphosis namely complete metamorphosis and incomplete metamorphosis.

Complete metamorphosis

This is a type of metamorphosis (complete life cycle) in which an insect undergoes four distinct stages of development.

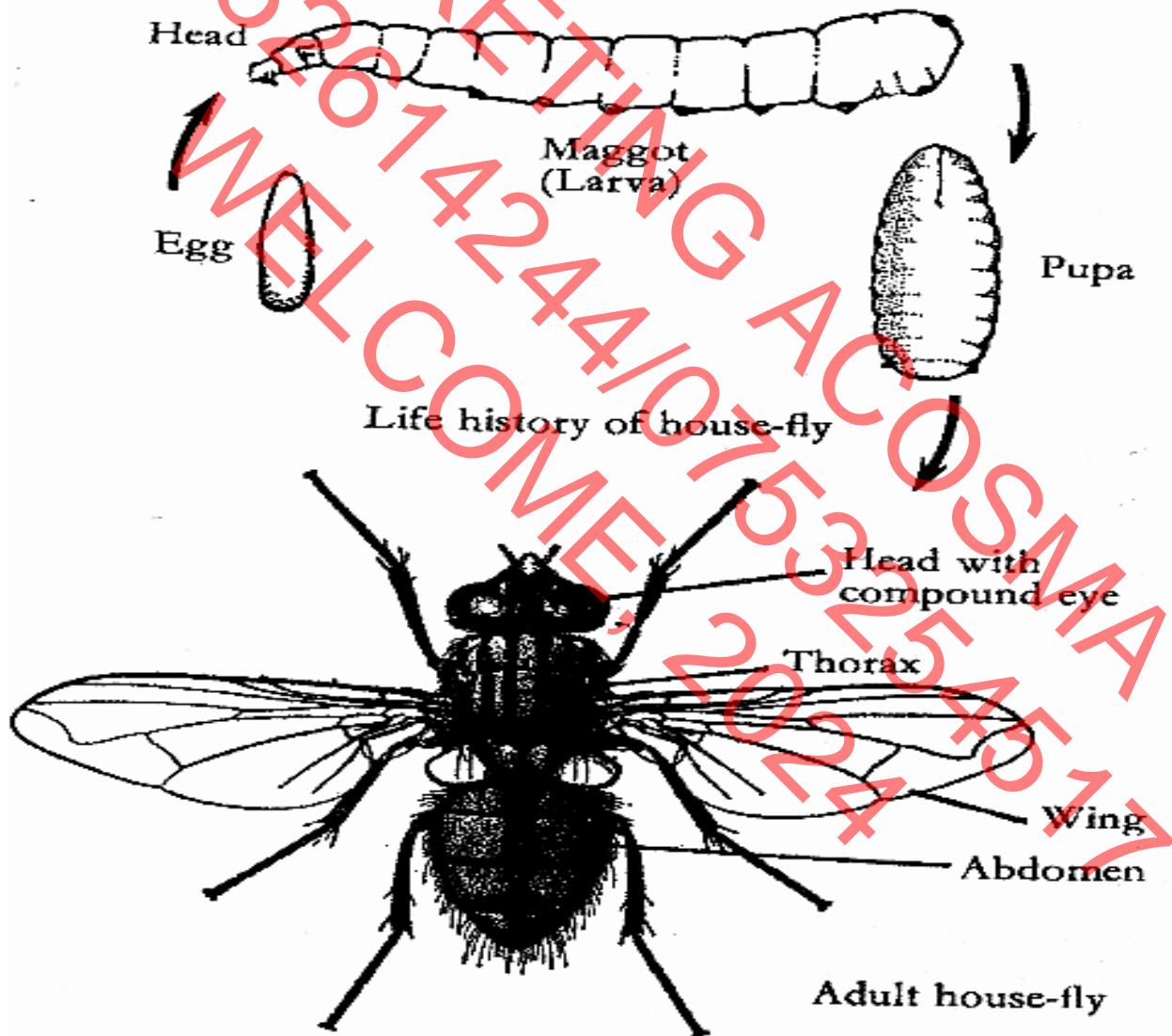
These include eggs, larva, pupa and adult.

Note: The larva stage of a housefly is the most active stage while the pupa stage is the most dormant stage

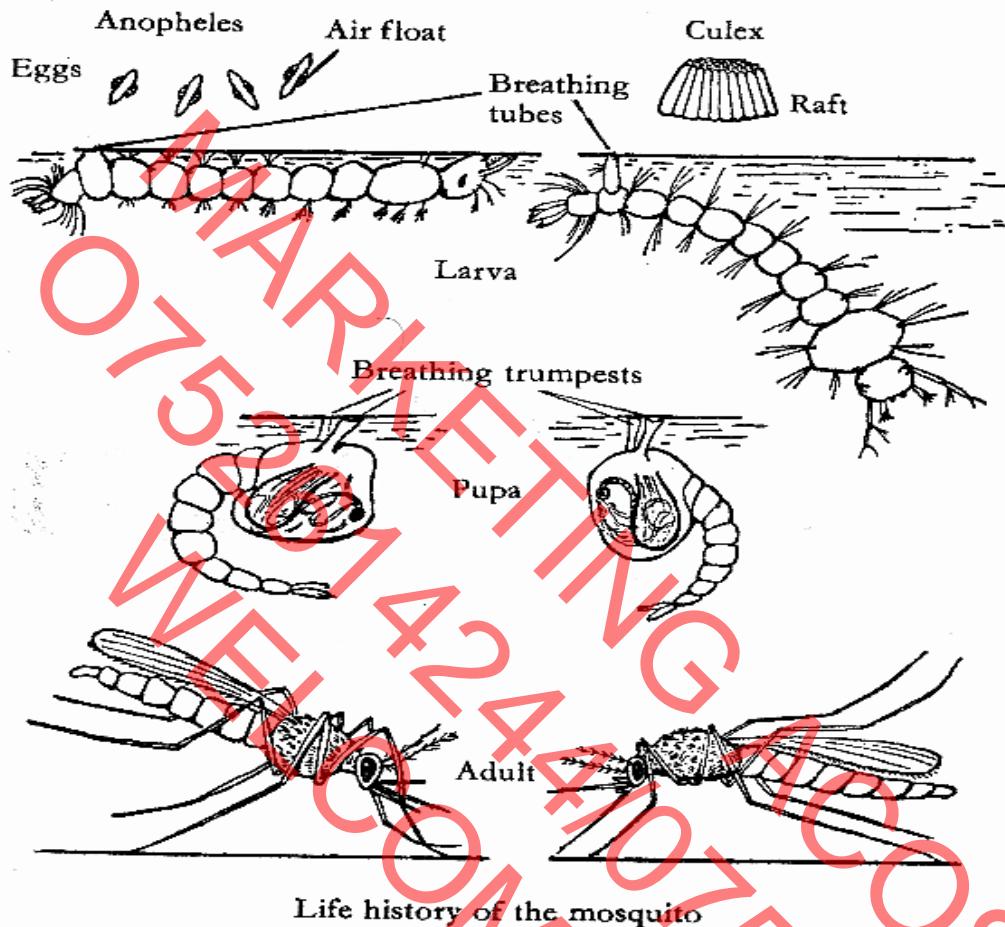
The larva stage of the following insects;

- ❖ housefly-maggots
- ❖ mosquito-wrigglers
- ❖ butterflies-caterpillar
- ❖ cockroach-nymph

A diagram showing a complete metamorphosis of a housefly.



A DIAGRAM SHOWING A COMPLETE METAMORPHOSIS OF AN ANOPHELES AND CULEX MOSQUITO.

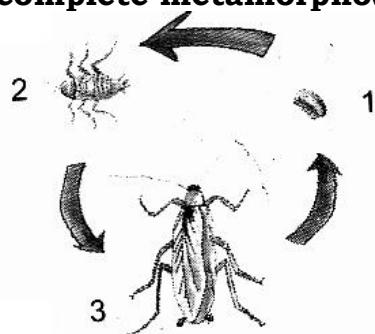


Examples of insects that undergo complete life cycles
Houseflies, mosquitoes, bees, wasps, butterflies, moth.

Incomplete metamorphosis.

- This is type of life cycle in which insects undergo three stages of development.

A diagram showing incomplete metamorphosis of a cockroach



Examples of insects which undergo incomplete metamorphosis.

Cockroaches, grasshoppers, locusts, crickets.

TOPICAL TEST.

1. Define the classification.

2. Give four characteristics of living things.

i) _____ ii) _____

iii) _____ iv) _____

3. Why are some vertebrates regarded as poikilotherms

4. Mention two groups of warm blooded vertebrates

i) _____ ii) _____

5. Which reptile protects itself against enemies by camouflaging?

6. Why are birds regarded as warm blooded vertebrates?

7. Give a reason why birds have streamlined bodies.

8. Give one mammal that reproduces by laying eggs.

9. How is a bat different from other mammals?

10. Give one way rodents are a disadvantage to a crop farmer.

11. What are ruminants?

12. How are toads able to live both on land and in water?

13. State the importance of a swim bladder to a fish.

14. How are millipedes different from centipedes in terms of feeding?

15. Give any two ways fish is adapted to staying in water.

- i) _____
- ii) _____

CORRECTIONS

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THEME: MATTER AND ENERGY
TOPIC: SOUND ENERGY.
LESSON 1 TYPES OF SOUND.

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

Sound

- ❖ Sound is a form of energy produced by vibration of an object.
- ❖ Sound is regarded as form of energy because it enables people to do work.
- ❖ Vibration is the movement of an object to and from or up and down.

Types of sound

- ❖ music.-noise
- ❖ Music is an organized sound produced by regular vibrations while noise is disorganized sound produced by irregular vibrations.

Sources of sound

- ❖ A source of sound is where sound waves originate from
- ❖ Sound travels through a medium by sound waves.
- ❖ Sound travels fastest in solids, faster in liquids and fast in gases.

N.B sound doesn't travel through a **vacuum**.

Reason: there is no medium for sound transmission in a vacuum.

Natural sources of sound

These are materials that produce their own sound naturally i.e. sound from birds singing, animals like cows mowing dogs barking etc, thunder and volcanic eruptions.

Artificial sources of sound.

These are materials controlled by humans in order to produce sound.

They are mainly musical instruments.

e.g. guitar, drum, flute, keyboard, tube fiddle, xylophones etc.

How living things produce sound.

- ❖ Mammals produce sound by the vibration of their vocal cords (human change the tongue and the lips to produce sound).
 - ❖ Birds produce sound by vibration of their rings of cartilage in of the trachea.
 - ❖ Insects like bees and mosquitoes produce sound by rapid flapping of their wings.
 - ❖ Grasshoppers and locust produce sound by rubbing their hind legs against their wings.

LEARNERS' ACTIVITY

- 1) In one sentence explain the term sound

List 4: The main components of a model

- 2) List two main sources of sound.

i) ii) iii)

- 3) How is sound produced

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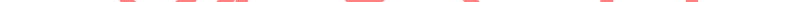
- 4) Give a difference between noise and music

Redundant *Redundant* *Redundant*

- 5) How do the following produce sound?

i) human beings

ii) Human beings
iii) birds

ii) birds 

iii) grasshoppers _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 2: Musical instruments,

- ❖ All musical instruments are material used to produce sound.
- ❖ They are used to accompany or give a beat to the flow of music.

Groups of musical instruments.

There are basically three categories of musical instruments basing on how they produce sound, how they are played and their features.

1. Percussion musical instruments

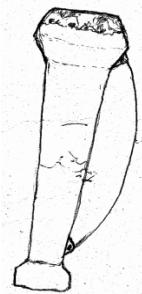
These are musical instruments which produce sound by vibration of their skins or the wood by beating or hitting them.

Examples of percussion musical instruments.

Xylophones, drums, long drum, bells, thumb pianos, brass band, drums, rattles, clappers/strikers.

Diagrams showing different examples of percussions.

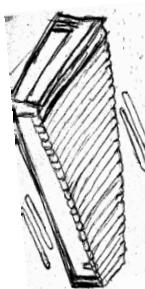
A long drum



A drum



Xylophone



bell



Note: pitch of percussion musical instruments can be determined by heating their skin to expand or tightening the skin.

LEARNERS' ACTIVITY

- 1) Write one word to mean instruments that produce sound by vibration when hit.

- 2) List two example of such instruments

i) _____ ii) _____

- 3) How does a drum produce sound?

- 4) In which way drums similar to xylophones

- 5) In the space below draw one example of a percussion instrument

CORRECTIONS

The form consists of 10 horizontal lines for writing responses to the questions.

DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 3: Wind musical instruments (aero phones).

- ❖ These are musical instruments which produce sound by the vibration of air blown inside them
- ❖ Some have holes numbered to produce different pitch of sound. Each hole produces a different pitch of sound.

Examples of wind musical instruments.

flute, trumpet, pan pipes, empty bottles, horns etc.

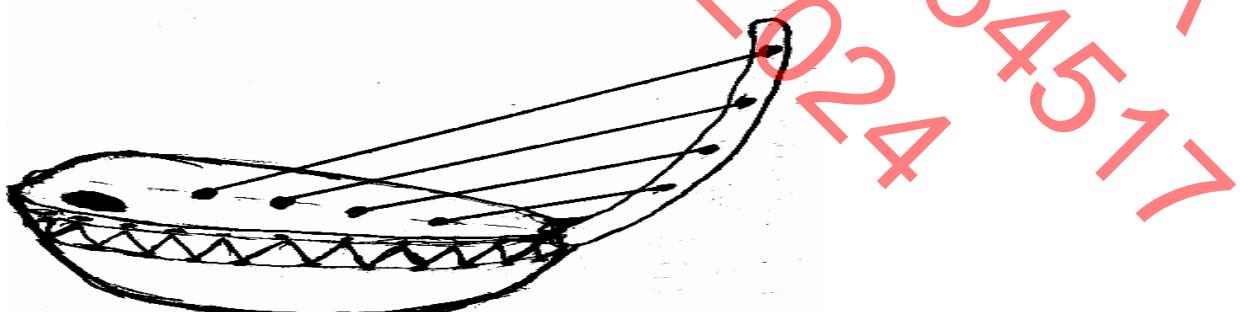
LESSON 4: String musical instruments. (chordophones)

- These are instruments made of strings and produce sound by vibration when they are plucked/bowed.
- They are mainly played by plucking of their strings or by bowing.

Examples of string musical instruments.

Guitar, tube fiddle, lyre, a harp, violin.

Diagram showing a structure of a bow harp.



- Strings of a bow harp have different lengths to produce different pitch of sound.

- From the diagram above, string A will produce low pitched sound while string D will produce high pitched sound when bowed.

Learners' Activity

1) Why is panpipe called a wind instrument?

2) Apart from panpipes give any two other examples of wind musical instruments

i) _____ ii)

3) How would you change the pitch of sound in a bottle half filled with water?

(a) In order to produce a high pitch

(b) In order to produce a low pitch

4) In the space below draw and name any one wind musical instrument

5) Use one sentence to explain string instruments

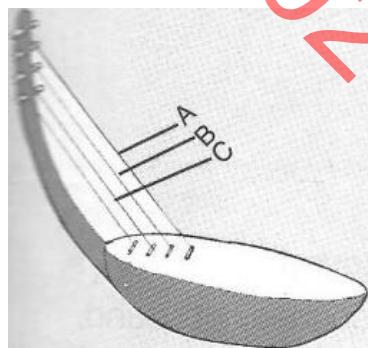
6) Write two examples of string instruments.

i) _____

ii) _____

7) How does a bow harp produce sound

8) The diagram below show a musical instrument. Use it to answer the questions that follow.



a) Identify the instrument above

b) Identify the string which produces the highest pitch of sound

c) Give a reason for your answer

CORRECTIONS

DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 5: Speed of sound

- ❖ For sound to travel there must be a medium.
- ❖ Sound needs a medium to transmit sound waves from the source to the destination.
- ❖ A medium should be a state of matter such as solids, liquids and gases.
- ❖ Sound travels fastest in solids, faster in liquids and fast in gases.
- ❖ The speed of sound in normal air is 330m/sec.

Class activities:

a) How sound travels through solids.

Place a watch on one end of a wooden table place your ear on the other end, you will clearly hear the ticking of the clock hands.

b) How sound travels through liquids.

Put a stone in water and hit it using another stone from normal air. The sound heard is loud showing that sound travels in liquids.

Factors affecting the speed of sound.

The following are some of the factors that interrupt the speed of sound.

- ❖ Wind, heat (temperature) and altitude.
- ❖ wind carries sound waves further to many directions
- ❖ Wind can also obstruct the sound waves by blowing it in opposite directions.
- ❖ During a hot day, sound waves move at a higher level compared to cold days.
- ❖ Sound waves find it easy to move along a lower altitude than going up a hill or mountain.

LESSON 6: Echoes

- ❖ An echo is a reflected sound formed as a result of obstruction of sound waves.
- ❖ Echoes have the same characteristic as the original sound.
- ❖ Smooth hard surfaces produce the best echoes while soft surfaces absorb sound.

Advantages of echoes:

- ❖ Bats use high pitched echoes to trap their prey at night in darkness.
- ❖ Bats use echoes to dodge obstacles at night.
- ❖ Pilots use echoes from hills, cliffs ends of tall building to avoid accidents.
- ❖ Sailors and sea men use echoes to determine the depth of the sea using an echo sounder.

Disadvantages of echoes.

- ❖ Echoes make sound difficult to interpret.
- ❖ Echoes cause accidents and noise pollution.

How are echoes reduced in cinema halls and theatres?

- ❖ Use of thick curtains.
- ❖ Use of porous materials such as soft boards in the speakers.

Volume of sound

- ❖ Volume is the loudness or softness of sound.
- ❖ The volume of sound depends on the amplitude of the vibration produced.
- ❖ Amplitude is the width of vibration.

Frequency

- ❖ Frequency is the number of vibrations produced per second.
- ❖ The greater the amplitude, the louder the volume of sound and vice versa.

DIAGRAM SHOWING FREQUENCY PRODUCED BY DIFFERENT STRINGS.



LEARNERS' ACTIVITY

1) Explain the term echo

2) Explain how echoes are formed.

3) How are echoes useful to human beings?

4) State any one danger of echoes in our environment

5) Why are walls and ceilings of cinema halls fitted with soft boards?

6) Why doesn't sound travel through a vacuum?

7) In which state of matter does sound travel fastest?

8) Mention any three factors that affect speed of sound.

- i) _____
- ii) _____
- iii) _____

9) A boy who was standing near a cliff shouted. If it took him 2 minutes to hear his echo, how far was the boy standing from the cliff?

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WELCOME, 2024
CORRECTIONS
MARKETING

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 7: Pitch of sound.

- ❖ Pitch of sound is the highness or loudness of sound produced.
- ❖ When objects vibrate, the sound produced can either be high or low.
- ❖ Pitch of sound can also be caused due to the amplitude produced.
- ❖ The faster the body vibrates, the higher the frequency and sound produced.

Factors that affect pitch of sound.

The following are the conditions that may make produced sound heard with a low or high pitch.

- ❖ Frequency.
- ❖ Tension of the string.
- ❖ Surface area for vibration.
- ❖ Length of the string.
- ❖ The smaller the surface area for vibration, the higher the pitch produced.
- ❖ High frequency produces high pitched sound.
- ❖

- ❖ When a string of a musical instrument is short, it will produce high pitched sound.

An experiment showing pitch of sound.



OBSERVATION:

Bell A: Will produce sound of the highest pitch.

Bell B: produced low pitched.

Bell C: will produce the lowest pitched sound.

Learners' Activity

1) Which term refers to the highness or lowness of sound?

2) Mention one factor that determines the pitch of sound.

3) How can you change the pitch of sound of a string instrument?

4) State the two ways of storing sound.

i) _____

ii) _____

5) Mention any one way of reproducing stored sound.

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 8: Human ear.

The human ear is a sensory organ used for hearing sound.

The ear also helps in balancing the body in the right position.

Parts of the ear.

The ear is divided into three main regions namely.

- ❖ The outer ear.
- ❖ The middle ear.
- ❖ The inner ear.

The outer ear.

- ❖ The outer ear is made up of the pinna and auditory canal. The pinna helps to trap or collect sound waves and direct them to the auditory canal.
- ❖ In the outer ear, there is hair to trap dust and other foreign bodies before damaging the ear drum.
- ❖ The ear drum is made up of a thin soft membrane sensitive to sound waves.
- ❖ it vibrates according to the pattern of sound waves received from the vibrating object.

The middle ear.

This consists of the three bones called the ossicles i.e. malleus (hammer), incus (anvil) and stapes (stirrup).

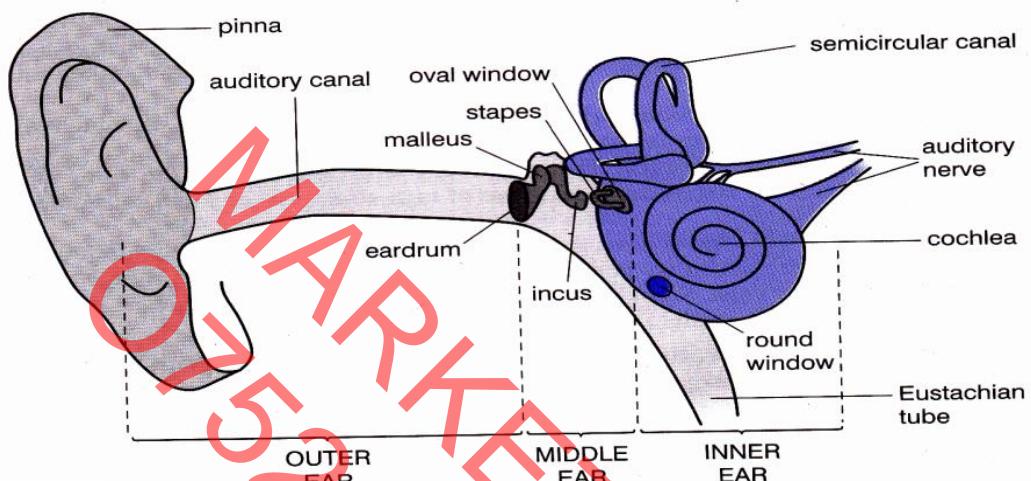
The ossicles amplify and transmit the vibrations produced by the ear drum across the middle ear to the inner ear.

It also contains the Eustachian tube to balance air pressure between the ear and atmospheric pressure.

The inner ear.

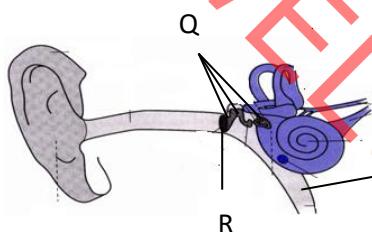
- ❖ This consists of the cochlea, semi-circular canals and the auditory nerves.
- ❖ The cochlea contains two fluids i.e. perilymph and endolymph to convert sound vibrations into impulses.
- ❖ The auditory nerve helps to carry sound impulses to the brain for interpretation.
- ❖ The semi-circular canals help to balance the body in a right posture.

Diagram showing the parts of the human ear.



LEARNERS' ACTIVITY

1. The diagram below show the human ear. Use it to answer the questions that follow.



- a) Name the parts labeled P and R

P _____ R _____

- b) What general name is given the structures labeled Q?

- c) State the function of the pinna

2. Apart from hearing, give any one other function of the ear.

3. State two ways of caring to the human ear

i) _____

ii) _____

4. In a sentence, give a difference between a partial and sensory deafness

5. State how partial deafness can be corrected

CORRECTIONS

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SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 9: Devices used in storing sound.

- ❖ Sound devices are materials used when recording and reproducing sound.
- ❖ We can store sound either by recording it on sound devices or writing it in solfa notation.
- ❖ We need to store sound for future use.

Sound devices used to record or store sound include

- ❖ Video Compact Magnetic Tapes.
- ❖ Video Compact Discs (VCDS)
- ❖ Digital Video Discs (DVDS)
- ❖ Computer Diskettes. (CDS)
- ❖ Audio Compact Discs

Devices used to reproduce the stored sound.

- ❖ Stored sound can be reproduced by playing the devices with stored sound in compact magnetic disc players.

Examples include:

Radio cassette, video disc players, computer monitor, gramophones/digital video disc player.

LESSON 10: Diseases and disorders of the human ear

Diseases of the human ear:

1. Otitis
2. Outer ear -infection
3. inner-ear - infection

Disorders of the human ear:

- ❖ Foreign body in the human ear. e.g. seeds/grain/soil/insects/chemicals.
- ❖ Deafness-inability to hear.
- ❖ It is caused by infection if not detected early.
- ❖ can be through inheritance
- ❖ Others by damaging the ear drum after piercing it with a sharp object.

Types of deafness (hearing defects) and correction

1. **partial deafness** -Removing the wax by syringing
2. **Sensory deafness** caused by old age, infections, loud sound and fracture.
 - ❖ Unable to differentiate between sounds
 - ❖ By good feeding to keep healthy even at old age
 - ❖ Avoid travelling in vehicles which are under bad mechanical conditions
 - ❖ Avoid staying in places with very loud sound.
 - ❖ Treatment of any infection as soon as the symptoms are noticed.

3. Permanent deafness

A person is totally unable to hear any sounds.

- ❖ Common in dumb people cannot be corrected.

Care for the human ear:

- ❖ Eating a balanced diet to keep healthy.
- ❖ Avoid staying near noisy places.
- ❖ Treat infections as soon as symptoms are sighted
- ❖ Avoid pushing sharp/piercing object into the ear.
- ❖ Clean the ear daily with clean water and soap.

Compare the human ear with the organs of other animals used for hearing e.g. the snake, fish, insects, amphibians, birds.

TOPICAL EXERCISE

1. How can the pitch of sound of a string instrument be changed?

2. State how a string instrument produces sound.

3. What is the speed of sound in air?

4. How does a flute produce sound?

5. Explain why it is difficult to hear clearly during a hot day.

6. Define how are echoes formed?

7. The term amplitude.

8. How are echoes useful to pilots?

9. Give two factors that determine the pitch of sound.

- i) _____
- ii) _____

10. Give one way of reproducing stored sound.

11. Mention two hearing defects.

- i) _____ ii) _____

12. State two devices used to store sound.

- i) _____ ii) _____

13. How can sound stored by solfa notation be reproduced?
- 14 . Mention two ways of caring for our ears.
- i) _____
- ii) _____
15. Apart from hearing, give one other function of the human ear.
- _____

CORRECTIONS

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SPELLING EXERCISE

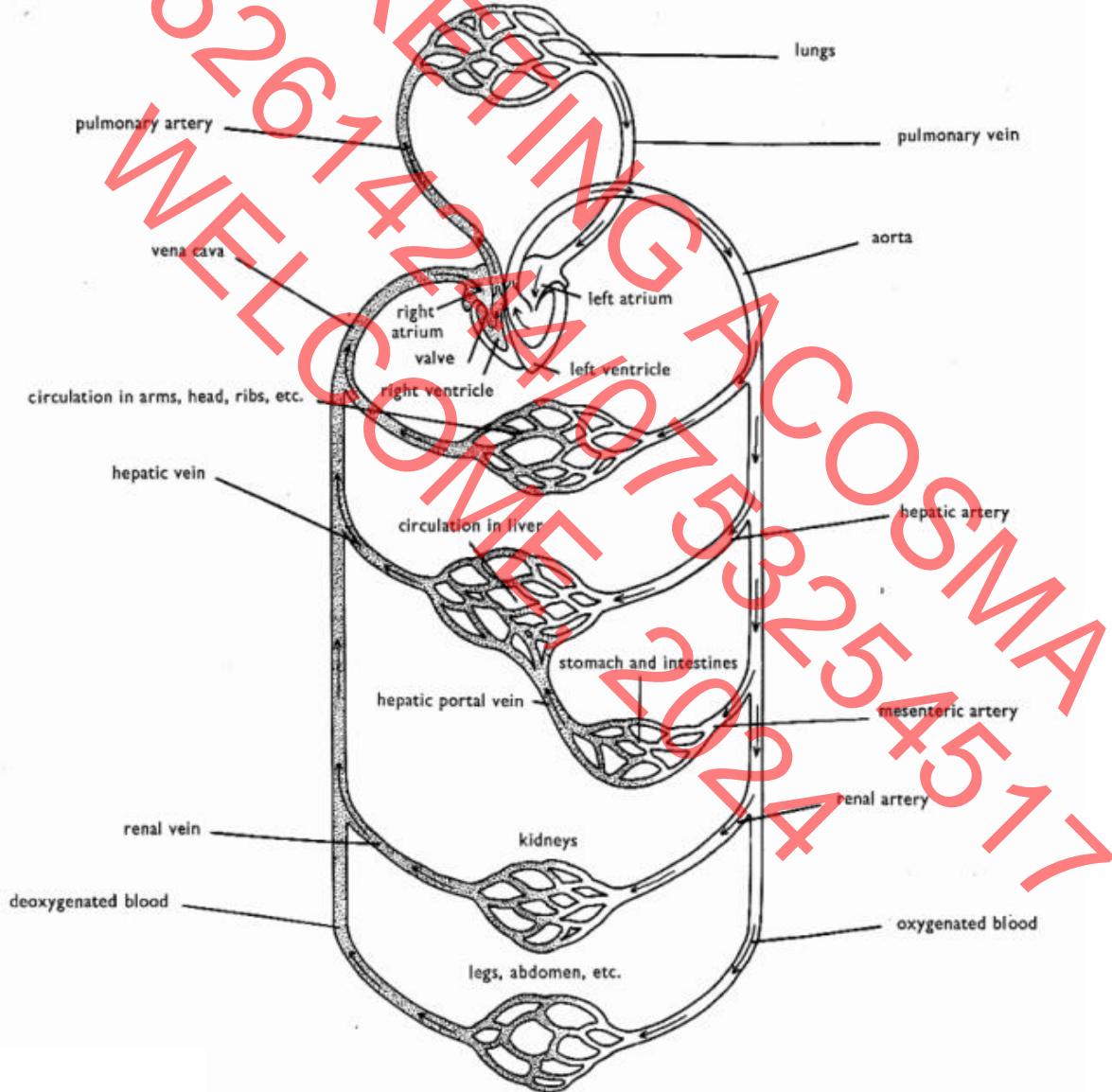
- i) _____
- ii) _____
- iii) _____
- iv) _____

THEME: THE HUMAN BODY.**TOPIC: CIRCULATORY SYSTEM.****LESSON 1:Components of the circulatory system.**

The body consist of seven main systems namely, reproductive, skeletal, digestive, respiratory, nervous, circulatory and excretory systems.

- ❖ The circulatory system is also called the transport system of the body.
- ❖ It involves the supply of body cells with fluids in the body.
- ❖ Components of the circulatory system are the features that connect to allow smooth flow of the body fluids.

Diagram showing the main blood circulation

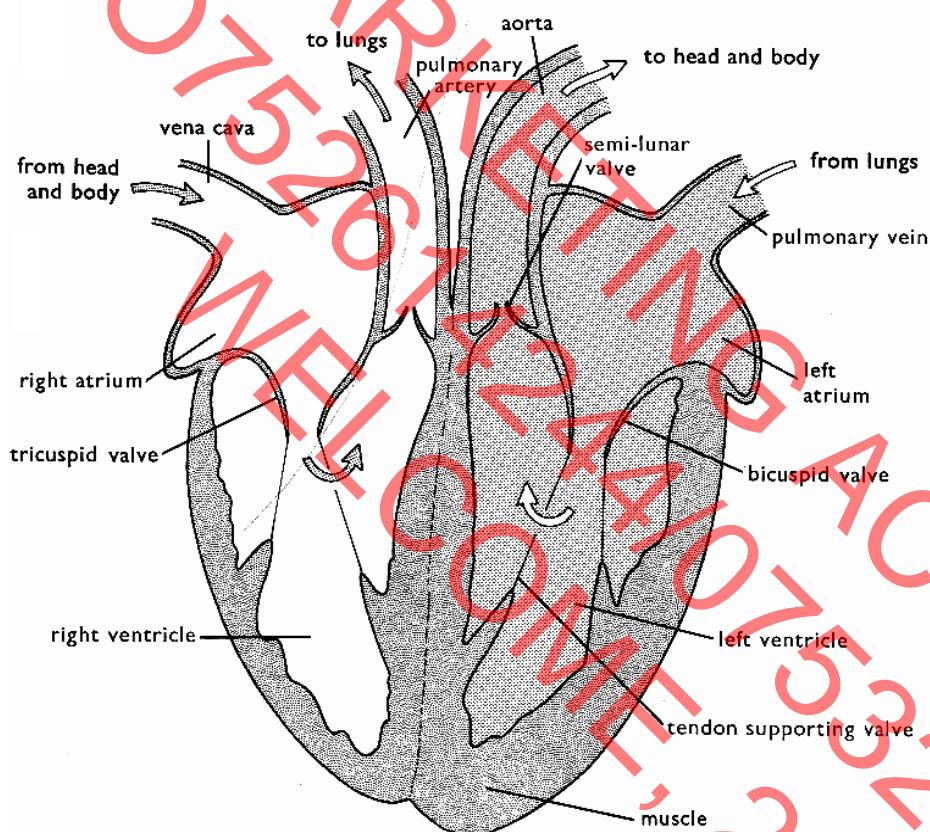


These are the heart, blood, blood vessels.

The heart;

- ❖ The heart is the main organ in mammalian body pump continuously blood to all body parts.
- ❖ Its enclosed in the thorax in a tough membrane called pericardium.
- ❖ The heart has four chambers, the two upper chambers and two lower chambers. The heart is made up of cardiac muscles.

THE STRUCTURE OF THE HUMAN HEART.



Note: the heart is protected by the ribcage and the normal pumping of the heart is 72 times per sec.

LEARNERS' ACTIVITY

- 1) Name the main organs of the circulatory system.

- 2) List the three blood vessels of the circulatory system

i) _____ ii) _____

iii) _____

3) Apart from the red blood cells mention any other three components of blood.

i) _____ ii) _____

iii) _____

4) What is the role of valves in veins?

5) State any four diseases of the circulatory system.

i) _____ ii) _____

iii) _____ iv) _____

6) Why isn't it necessary for arteries to have valves?

CORRECTION

LESSON 2: How the heart works;

Circulation of blood in the heart is supported by four main vessels. These are;

Vena cava, pulmonary artery, pulmonary vein and aorta.

Vena cava: It receives blood with less oxygen called deoxygenated blood from all parts of the body to the heart.

- ❖ Blood is then pushed down from the right upper auricle, to the ventricle and then to the lungs via the pulmonary artery.
- ❖ Blood visits the lungs to pick oxygen and drop off carbondioxide.
- ❖ Oxygenated blood (blood with more oxygen) is then carried back to the heart through the pulmonary vein to be pumped to all parts of the body through the aorta.
- ❖ The heart has valves to prevent backward flow of blood in the heart.
- ❖ It also separated into two sides by the septum to avoid de-oxygenated blood from mixing with the oxygenated blood from mixing with the oxygenated blood.
- ❖ The left part of the heart is made up of thick walls due to its resistance to high blood pressure.
- ❖ Doctors are able to listen to the flow of blood or heart beat using an instrument called **stethoscope** and **sphygmomanometer** for the blood pressure.

LEARNERS' ACTIVITY

1) List the two upper chambers of the heart

i) _____ ii) _____

2) Which blood vessel leads blood from the body to the heart?

3) Which part of the heart pumps blood to the lungs?

4) Why is the left ventricle wall thicker than the right ventricle wall?

5) Why does blood flow to the lungs before it is supplied to the rest of the body parts?

Corrections

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 3: Blood.

- ❖ Blood is the red liquid that flows continuously in the body.
- ❖ It becomes bright red when oxygenated and dark red when de-oxygenated.

Components of blood.

Blood component are

- ❖ Platelets (thrombocytes)
- ❖ Plasma (fluid of blood)
- ❖ White blood cells (leucocytes)
- ❖ Red blood cells (erythrocytes)

Note: an adult person has a capacity of 5-6 liters of blood in the body.

Red blood cells.

These are blood components made of circular disc shapes and oxygen.

- ❖ They are made in the red bone marrows of short bones.
- ❖ They appear red due to the existence of the haemoglobin.
- ❖ When the haemoglobin combines with oxygen it forms oxy-haemoglobin blood which is reddish bright in colour.

Diagram of a red blood cell



Function of red blood cells.

- ❖ Helps to carry oxygen around the body.

Note: Plasmodia parasites attack the red blood cells hence causing malaria to the people.

LESSON 4:Blood plasma

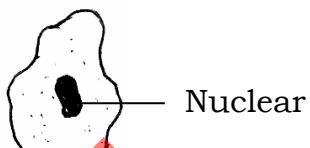
- ❖ It's the liquid or watery part of blood
- ❖ It's pale in colour.

Components of plasma.

- ❖ Blood proteins, digested food, hormones and mineral salts, water.
- ❖ Blood plasma transports carbondioxide from all body parts to the lungs.
- ❖ blood plasma transports digested food to all parts of the body
- ❖ Blood plasma also transport hormones from the glands to where they are needed.

White blood cells. (leucocytes)

These are blood cells with a nucleus but with no haemoglobin in their cytoplasma.



- ❖ White blood cells are commonly made from lymph nodes the spleen and grey bone of long bones.
- ❖ They help to fight against diseases causing germs in the body by engulfing and producing more anti bodies.
- ❖ The white blood cells have an irregular shape to enable them engulf the germs.

Blood platelets. (thrombocytes)

- ❖ Blood platelets are also made in the red bone marrows.
- ❖ They help to reduce over bleeding by clotting around the wound.
- ❖ They are very many in the body with no nucleus and live shortly.

DIAGRAMS SHOWING DIFFERENT BLOOD CELLS



Note: shortage of blood platelets results into uncontrolled bleeding in case of a wound.

- ❖ Too many white blood cells in the body may cause a disease called leukaemia.

Learners' Activity

1) How useful are the following components of blood in the body?

a) Red blood cells

b) White blood cells

c) Platelets

d) Blood plasma

2) Identify a disease that attacks the following

a) Red blood cells

b) White blood cells

CORRECTIONS

DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 5: Blood groups

- ❖ Blood is group according to the presence of antigens A or B in the red blood cells.
- ❖ there are basically four different blood groups
 - Blood group A**
 - Blood group B**
 - Blood group AB**
 - Blood group O**
- ❖ When a person bleeds and becomes anaemic the victim needs to replace the lost blood. This can be done through blood transfusion.
- ❖ Blood transfusion is the transfer of screened blood from one person to another of the same group.
- ❖ A person who receives the donated blood is then called a blood recipient.
- ❖ One who gives out blood is called blood donor.

- ❖ A universal recipient is a person who can receive blood from any other blood group, however can donate blood to persons with blood group AB.
 - ❖ blood group O is also called a universal blood donor because can donate blood to any other blood group but receives blood from blood group O only
 - ❖ Blood before transfusion should be screened and stored safely in the blood bank.
 - ❖ In Uganda it's done at Nakasero blood bank.

Activity

- ~~WELCOME TO A COSMopolitan MARKETING~~

 1. Mention four blood groups.
i) _____ ii) _____
iii) _____ iv) _____
 2. How is blood grouped?

 3. Define the term blood transfusion.

 4. Why should blood be screened before transfusion?

 5. Who is a blood donor?

 6. How is a universal recipient different from a universal donor?

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 6: Blood vessels;

- ❖ Blood vessels are muscular tubes that help in proper circulation in the human body
- ❖ They run from the heart to all other parts of the body.

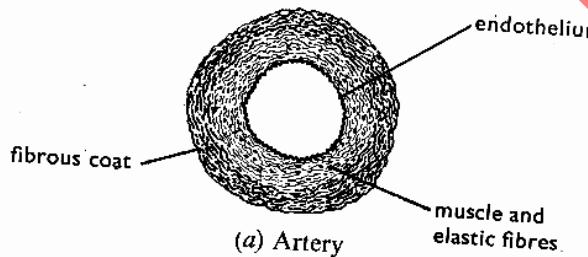
Types of blood vessels.

There are basically three types of blood vessels namely arteries, veins and capillaries.

Arteries.

- ❖ Arteries are mainly blood vessels that carry blood away from the heart.
- ❖ They have thick walls and narrow blood passage or lumen.
- ❖ They lack valves.
- ❖ Blood in arteries flow at a high pressure.

The structure of an artery



Note: most arteries carry oxygenated blood except pulmonary artery

Veins:

These blood vessels that carry blood towards the heart.

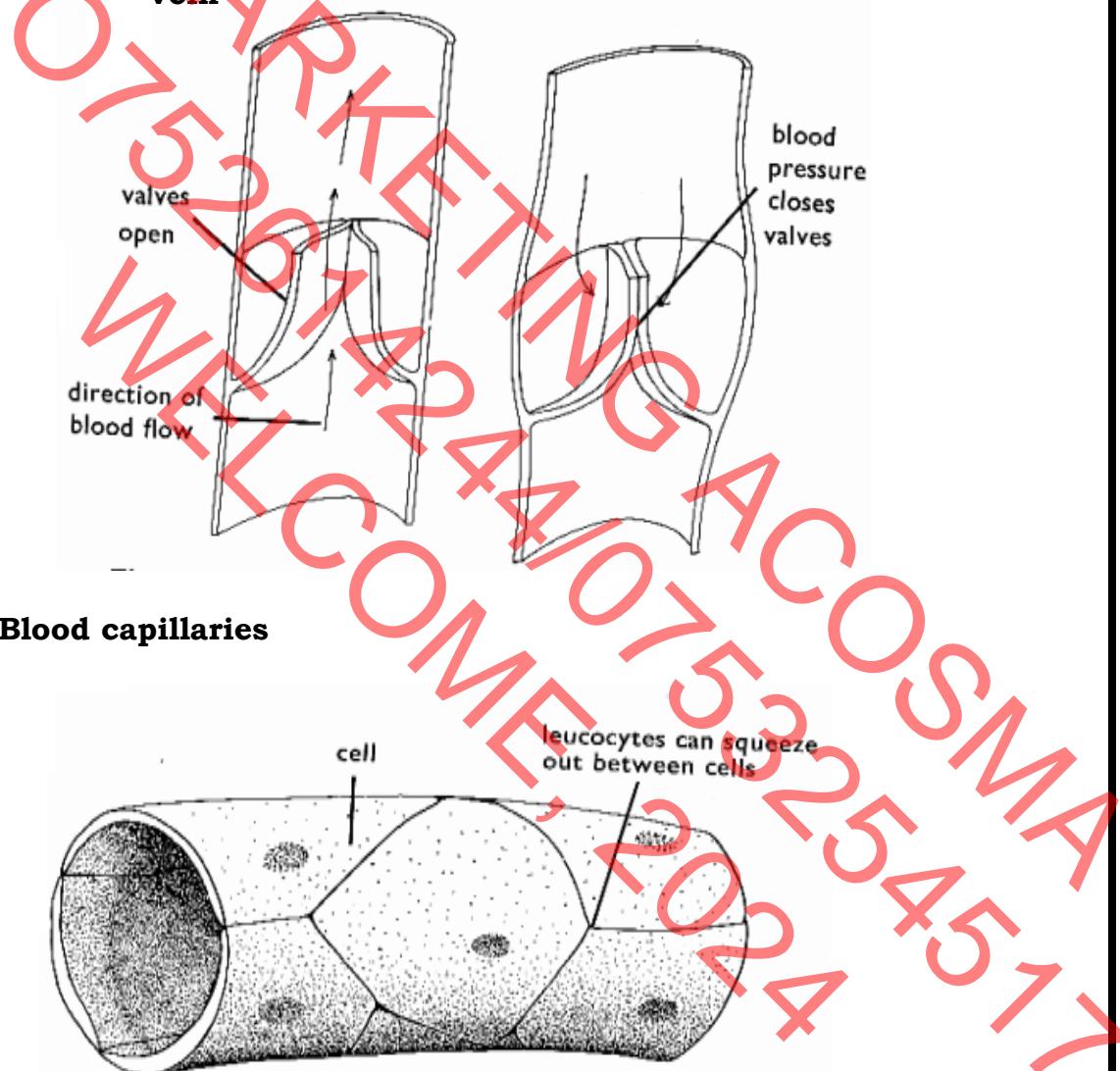
- ❖ They have valve, wider lumen and thin walls
- ❖ Valves in veins open in one direction to prevent back ward flow of blood.
- ❖ Blood in vein flows at a low pressure.

Capillaries

These are the smallest blood vessels that help to connect the veins to arteries.

- ❖ Capillaries help to allow the exchange of blood materials.
- ❖ All veins carry deoxygenated blood except the pulmonary vein.
- ❖ The pulmonary vein carry oxygenated blood

Structures showing veins and blood capillaries.



Note: the aorta is the biggest artery while the vena cava is the biggest vein in the body.

LEARNERS' ACTIVITY

- 1) Identify any two blood groups
 - i) _____ ii) _____
- 2) Give the functions of the following blood vessels
 - a) Arteries _____
 - b) Veins _____
- 3) Give any two structural differences between arteries and veins
 - i) _____
 - ii) _____
- 4) State any one functional difference between arteries and veins _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 7: Diseases of the circulatory system

Blood diseases

These are disease which commonly attacks the blood components,

- ❖ Malaria, leukaemia, anemia, haemophilia, HIV, diabetes and sickle cell anaemia.

Diseases that attack the heart.

These include

- ❖ Thrombosis
- ❖ Heart attack
- ❖ Hypertension
- ❖ Anaemia is caused due to lack of iron in one's diet.
- ❖ Iron helps in the formation of haemoglobin which easily combines with the oxygen in the red blood cells.
- ❖ Sickle cell anaemia is a condition when one's red blood cells are single celled and therefore unable to carry enough oxygen around the body.
- ❖ Haemophilia is condition in which one's blood is unable to clot in case of an injury.
- ❖ Leukaemia is blood cancer which makes the number of white blood cells abnormally higher.
- ❖ Malaria is caused by plasmodia germs spread by female anopheles mosquito.

These commonly attack and destroy the red blood cells.

Heart diseases;

These are diseases that mainly affect the normal functioning of the heart.

They include; coronary thrombosis, hypertension and heart attack.

Coronary thrombosis

This is a disease that affects the heart and is caused due to the blockage of the coronary arteries that supply oxygenated blood and digested food to the heart. It makes the cardiac muscles weak and may stop working due to limited oxygen and digested food supply.

Hypertension.

This is a disease of the walls of the arteries making or reducing their lumen. This caused mainly due to smoking of poisonous drugs contained in tobacco. The poisonous drugs damage the cardiac muscles reducing their functioning.

Diabetes:

This is caused due to the presence of too much glucose in the body.
This disease commonly affects people who feed on a lot of sugary foods and do not do heavy work to burn the glucose in the body.

LEARNERS' ACTIVITY

- ~~QUESTION~~

 - 1) Write four diseases of the circulatory system
i) _____ ii) _____
iii) _____ iv) _____
 - 2) Identify one vector disease of the circulatory system

 - 3) Mention one circulatory disease which affects white blood cells

 - 4) Mention one cause of heart diseases

 - 5) Suggest one way of improving proper functioning of the circulatory system.

~~CORRECTIONS~~

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 8: HIV and AIDS

- ❖ HIV and aids is a disease that affects the circulatory system.
- ❖ HIV stands for : Human Immunodeficiency Virus
- ❖ AIDS stands for : Acquired Immune Deficiency Syndrome
- ❖ This disease attacks one's immune system making the body lack defense to infections.
- ❖ The victim's body becomes weak or unable to defend itself from infections due to the destroyed white blood cells.
- ❖ HIV does not kill the victim, it's the secondary infections untreated that kill the victim.

Ways through which HIV and AIDS is spread.

- ❖ Having unprotected sex with an infected person.
- ❖ Sharing skin piercing objects with an infected person.
- ❖ Through transfusion of unscreened blood.
- ❖ Through some cultural practices such as circumcision.

Effects of AIDS.

- ❖ Having makes one's immunity destroyed resulting into easy attack by infection.
- ❖ AIDS causes death of the victim.
- ❖ A family or community can easily lose an important person in case of death.
- ❖ AIDS has led to orphans and increased number on street children.

Ways of controlling the spread of HIV and AIDS.

- ❖ having protected sex with trusted sex partners
- ❖ avoid sharing skin piercing objects with an infected person
- ❖ Through transfusion using screed blood.
- ❖ Avoid sharing knives during cultural practices such as circumcision/ tattooing.

NOTE: AIDS Victims should be given a lot of care by encouraging them to promote personal hygiene, feed well and take their drugs in time. Tuberculosis victims are mistaken to be HIV victims due to the same signs and symptoms.

LEARNERS' ACTIVITY

1. Write the following in full
 - i) HIV _____
 - ii) AIDS _____
2. Identify the cause of AIDS.

3. suggest two ways in which AIDS is spread
 - i) _____
 - ii) _____
4. Why are adolescent girls at a higher risk of getting HIV and AIDS than boys of the same age group

5. Suggest a piece of advice to adolescent boys and girls for the prevention of HIV and AIDS.

6. List two disorders of the circulatory system.
 - i) _____
 - ii) _____
7. Suggest one way of increasing the volume of blood circulation in the body.

8. Give any four groups of people who are at risk of getting HIV/AIDS
 - i) _____
 - ii) _____
 - iii) _____
 - iv) _____

Corrections

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 9: Disorders of the circulatory system/care of the HEART

Disorders of the circulatory system

- ❖ cuts
- ❖ strings
- ❖ burns
- ❖ scalds
- ❖ Hiccups.

Care of the organs of the circulatory system

- ❖ Eating a balanced diet.
- ❖ doing regulatory physical exercises
- ❖ Regular visits to hospital for medical check up
- ❖ Avoid eating too fatty/oil food stuffs.
- ❖ Avoid rough games.
- ❖ Take much care to accidents.

Ways of Increasing volume of Blood in Circulation

- ❖ Eating a balanced diet.
- ❖ Eating foods mainly rich in iron e.g. greens, animal liver and kidneys
- ❖ Taking ferrous tablets with advice from a medical worker.

TOPICAL TEST

THEME HUMAN HEALTH
TOPIC: ALCOHOL IN OUR SOCIETY
LESSON 1
SUBTOPIC: TYPES OF ALCOHOL.

Alcohol:

Alcohol is a chemical substance that makes people drunk once taken in.

Types of alcohol.

There are basically two types of alcohol namely;

- ❖ Ethyl (ethanol) alcohol
- ❖ Methyl (methanol) alcohol

Ethyl (alcohol) is the most common type of alcohol found in alcoholic drinks.

It's the type of alcohol formed immediately after the ripening of a plant fruit.

Plant fruits ripen due to ethylene hormone.

Methyl alcohol (e.g. methanol) is the most dangerous type of alcohol.

It can easily cause blindness in case of contact with the eyes.

Examples of alcoholic drinks include:

'malwa', 'tonto' and beer.

Reasons why people drink alcohol.

People drink alcohol for a number of reasons

- ❖ People drink alcohol due to excitement or happiness
 - ❖ To celebrate their successes
 - ❖ To forget their problems
 - ❖ To quench thirst

LEARNERS ACTIVITY

1. In one sentence, explain the term alcohol.

 2. Identify any two examples of alcoholic drinks
i) _____ ii) _____
 3. Mention the two main types of alcohol.
i) _____ ii) _____
 4. Give any two reasons why people take alcohol.
i) _____ ii) _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 2: Methods of producing alcohol.

There are basically two methods of producing alcohol namely;

- ❖ Fermentation method.
- ❖ Distillation method

Fermentation method.

Fermentation is the process of turning sugar from plant juice and water into alcohol

This is aided by yeast

The sugar found in fruit juice is worked upon by yeast to form fermented alcohol.

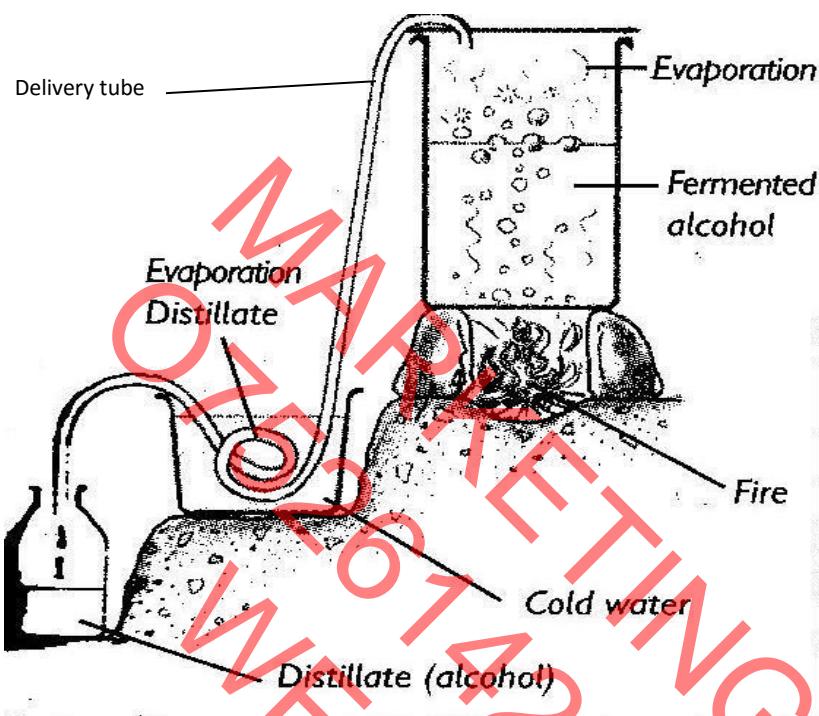
Example of plant materials used to produce fermented alcohol are;

Ripe banana, cassava flour, maize, millet, sorghum

Distillation method.

- This is a process of obtaining pure alcohol from fermented alcohol by boiling evaporating and condensing of the alcohol vapour to form distillate
- Distillation method involves two process namely evaporation and condensation of the vaporised alcohol into a liquid.
- The liquid obtained using this method is called a distillate.
- Examples of alcoholic drinks obtained through this method are waragi, whisky, rum gin, vodka.

DIAGRAM SHOWING DISTILLATION METHOD OF MAKING ALCOHOL.



- ❖ Heat source provides the heat to cause evaporation.
- ❖ Cold water helps to condense the vapourised alcohol into a liquid.
- ❖ Note: home distillation of alcohol is illegal due to the likely
- ❖ Accidents that may occur.

LEARNER'S ACTIVITY

1. In one sentence, explain each of the following terms;

a) Fermentation

b) Distillation

2. State the importance of each of the following during distillation;

a) Cold water

b) Heat source

3. In one sentence, give a reason why home distillation of alcohol is illegal.

4. Give any three examples of plant local materials used to produce fermented alcohol
- i) _____ ii) _____
iii) _____

5. Define the term distillate

CORRECTIONS

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DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 3: Alcoholics and alcoholism

Uses of alcohol in the society.

- ❖ Alcohol is an important drug in the society recommended on most celebrations.
- ❖ Alcohol (methyl alcohol) is used by doctors to sterilize medical instruments that cannot be boiled on cleaning.
- ❖ Alcohol can be used in some thermometers.
- ❖ Alcohol (methylated spirit) can be used to clean the skin before an injection is taken.
- ❖ Alcohol is also used as a disinfectant on wounds.
- ❖ Alcohol can be used by builders to mix paints and dyes.

Alcoholism.

- ❖ This is a condition that results from the prolonged use of alcohol.
- ❖ It results into the body's addiction to alcohol.
- ❖ It also makes the body functioning controlled by the alcohol intake.
- ❖ The person who is who is addicted to taking alcohol for his or her normal body functioning is called an alcoholic.

Factors that may lead one to take alcohol

- ❖ Stress
- ❖ Sad news
- ❖ Peer pressure
- ❖ Family background or life styles.
- ❖ Seductive advertisement.

LEARNERS ACTIVITY

1. Explain the following terms;

a) Alcoholic

b) Alcoholism

2. Mention any three factors that may lead to alcoholism

i)

ii)

iii)

3. State any two ways in which alcohol is important in the society.

i)

ii)

4. State two ways alcohol affects;

i] an individual

i)

ii)

a) the family

i)

ii)

b) The community

i)

ii)

5. State the law governing the use of alcohol in Uganda.

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 4: Effects of alcoholism.

The habit of taking alcohol causes social and health problems in the society.

These effects are caused to; individuals, family or the community.

a) Individuals.

The following are the effects that may result from alcoholism to an individual.

- ❖ It causes damages to body organs such as, liver, brain and stomach walls
- ❖ Leads to personal neglect. (self-neglect)
- ❖ Leads to loss of appetite for food resulting into stomach ulcers.
- ❖ Leads to poverty since most of the money is spent on buying alcohol.

b) To the family;

The following are effects that can be caused in case one of the family members is an alcoholic.

- ❖ Family poverty.
- ❖ Family neglect.
- ❖ Loss of family respect.
- ❖ Antisocial behavior, child abuse, separation of spouses.
- ❖ Causes immorality in children.

a) To the community.

- ❖ Alcoholism leads to road accidents by drivers working under the influence of alcohol.
- ❖ Alcoholism also leads to increased crime rates in the community.
- ❖ Alcoholic officials delay community services since most times they are drunk.

Laws governing alcohol in Uganda.

- ❖ Persons below 18yrs of age are not allowed to drink alcohol in public places.
- ❖ All public places dealing in alcohol should be licensed after fulfilling certain standards.
- ❖ Drivers are not allowed to drive under the influence of alcohol.
- ❖ All forms of home distillations, transportation and possession of alcohol is illegal.

Smoking

- ❖ This is the regular use of tobacco by a person.

Commonly smoked drugs:

- ❖ Njaga, marijuana, Bhangi.
- ❖ opium.
- ❖ cocaine. it is sniffed through the nose.
- ❖ Tobacco. This contains Nicotine and tar.

Ways people use tobacco include;

- ❖ Through the burning pipes.
- ❖ Through burning cigarettes.
- ❖ By sniffing tobacco powder.
- ❖ By chewing the leaves of tobacco.

Note; tobacco contains a dangerous gas called carbon monoxide and dangerous chemicals namely Nicotine and Tar.

Types of smoking.

There are two types of smoking namely,

- ❖ Active smoking.
- ❖ Passive smoking.

Active smoking is the act of inhaling tobacco smoke directly from a burning cigarette.

Passive smoking is the act of inhaling air contaminated by tobacco smoke from an active smoker.

Reasons why people smoke;

People have different reasons why they smoke

- ❖ Some smoke to warm their bodies.
- ❖ Some smoke due to peer pressure.
- ❖ Some smoke to concentrate on their work.
- ❖ Some smoke to feel confident.
- ❖ Some smoke to look sophisticated/ important.

Effects of smoking.

- ❖ Tobacco smoking is harmful to one's health.
- ❖ Tobacco contains poisonous chemicals and a gas.

These are nicotine, tar and carbon monoxide gas.

Disease caused due to smoking.

Diseases that result from smoking affect the respiratory system. they include;

- ❖ Lung cancer, emphysema, tuberculosis.
- ❖ Tuberculosis, bronchitis and pneumonia are worsened by smoking.

Smoking is also dangerous to pregnant mother in the following ways;

- ❖ Causes miscarriage/abortion.
- ❖ Causes pre mature birth/ still birth.
- ❖ Causes underweight births.

Effects of smoking to the community.

- ❖ Smoking can easily result into fire out breaks in an area.
- ❖ Smoking causes air pollution.
- ❖ It creates bad practices among children in the area.

Effects of smoking to the family.

- ❖ All family members become passive smokers.
- ❖ Young children copy bad habits from elders who smoke.
- ❖ It can also lead to loss of family income since much of the money used for smoking.

How to avoid smoking.

- ❖ Keeping busy during free time by involving in football, volleyball, and music to avoid thinking about smoking.
- ❖ Avoid joining peer groups of people who use tobacco and other drugs.
- ❖ Advise friends who smoke about the dangers of smoking.

LEARNERS ACTIVITY

1. Explain the term smoking

2. Identify the different ways people use tobacco

i) _____
ii) _____

3. Differentiate between passive and active smoking.

4. Give any two reasons why people smoke.

i) _____
ii) _____

5. State two ways in which smoking can be dangerous to pregnant mother and to the family.

i) _____
ii) _____

6. Outline any two ways of controlling smoking

i) _____
ii) _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 7: Drugs:

A drug is any chemical substance introduced in the body that affects the functioning of the body systems.

Drugs can be introduced in the body voluntarily or involuntarily.

Types of drugs.

There are basically two types of drugs namely.

- ❖ Essential drugs.
- ❖ Narcotic drugs.

Narcotic drugs are drugs which cause addiction after a prolonged use or dependency.

Examples of narcotic drugs are,

Tobacco, alcohol, marijuana, opium etc.

Essential drugs.

These are drugs used by people to meet their health problems.

- ❖ They are categorized into four groups
- ❖ Pain killers – for reducing pain.
- ❖ Curative drugs – used to cure diseases.
- ❖ Preventive drugs are commonly vaccines used to prevent diseases
- ❖ Contraceptives – mainly used in family planning.

Qualities/ characteristics of essential drugs.

The following are the attributes of essential drugs:

- ❖ They should be common and affordable.
- ❖ They should have less side effects and meet people's health problems.
- ❖ They should have value for money.

Ways drugs are introduced in the body.

- ❖ By swallowing (tablets)
 - ❖ By injections (injectables)
 - ❖ By drinking (syrups)
 - ❖ By smearing (ointments)

LEARNERS ACTIVITY

1. In one sentence, explain the term drug.

2. Identify two different types of drugs.

i)

ii)

- ### 3. What are essential drugs?

4. In three sentences, explain the qualities of essential drugs.

i)

ii)

iii)

5. State any two ways in which essential drugs are introduced in the body

i)

ii)

1

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 8: Types of essential drugs:

Essential drugs are grouped into two types according to their characteristics namely;

- ❖ Traditional drugs.
- ❖ Laboratory drugs.
- ❖ Traditional drugs are drugs which have existed before the introduction of science and technology
- ❖ Traditional drugs can also be modernized in the laboratories.

Examples- blackjack cures wounds

- ❖ ‘bombo’ grass for cough etc.
- ❖ ‘enkejje’ for measles

Characteristics of traditional drugs.

- ❖ They are used in their raw form mainly
- ❖ Their side effect on human health is not known.
- ❖ Their purity and quality changes.
- ❖ They are commonly not packed and sealed.

Laboratory manufactured drugs.

These are drugs which are commonly made from the laboratory with both manufactured dates and expiry dates.

Examples include:

Cough mixtures, chloroquine, paracetamol, pilton, ORS for rehydration, capsules etc.

These drugs are commonly found in clinics, hospitals and other health units.

Characteristics of laboratory manufactured drugs

- ❖ They are well packed and sealed to prevent easy contamination.
 - ❖ Have expiry dates
 - ❖ Are the same for every quantity made they have labels, names and what they cure.
 - ❖ Their stability and strengthen are known.
 - ❖ They have same purity and quality.

LEARNERS ACTIVITY

- 1.** State the difference between traditional drugs and laboratory drugs.

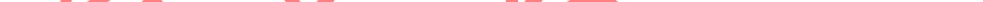
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- 2.** Give two examples of traditional drugs.

i)

iii)

- 3.** Outline any two characteristics of traditional drugs.

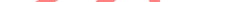
i) 

iii)    

4. List down any three characteristics of laboratory manufactured drugs

i)

iii)    

II)   

- 5 Give any two examples of laboratory drugs.

Give any two examples of laboratory drugs.

1) _____
2) _____
3) _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

i) _____

ii) _____

iii) _____

iv) _____

LESSON 9: Drugs prescription;

This is the written information given by a health worker on how to use a certain drug.

Prescription of drugs is based on the age, weight of the patient, sex or gender and duration or length of illness.

Prescribed drug consists of; name of the drug the disease it cures, time of taking the drug, the dosage.

Importance of drug prescription.

- ❖ It prevents people from taking under or over dose.
- ❖ It helps the patient to avoid drug misuse.

Under dosage; is when ones takes less than the recommended drugs.

Drug misuse; is the act of using a drug without or against the health workers advice. It is the wrong use of a drug.

Dangers of buying drugs from shops or markets.

- ❖ Drugs may be harmful or expired.
- ❖ Such drugs are not well prescribed and stored.
- ❖ Drugs may be contaminated
- ❖ They may be spoilt/damaged
- ❖ They may be fake drugs.

LEARNERS ACTIVITY

1. Explain the following terms;

i) Drug prescription _____

ii) Drug misuse _____

iii) Drug abuse _____

2. Give two reasons why health workers should prescribe drugs to patients.

i) _____

ii) _____

3. State any two dangers of buying drugs from shops.

i) _____

ii) _____

4. State any two ways in which people misuse drugs today.

- i) _____
- ii) _____

CORRECTIONS

DATE: _____

SPELLING EXERCISE

- i) _____
- ii) _____
- iii) _____
- iv) _____

LESSON 10: Drug storage.

- ❖ Drugs need to be kept in a clean cool dry place to prevent them from contamination.
- ❖ Cold chains are used to keep vaccines where there is no electricity
- ❖ Drugs should also be kept away from children to prevent child poisoning at home.

Dangers of poor storage of drugs.

- ❖ Drugs may easily become contaminated and lose its curative value.
- ❖ Poorly stored drugs instead become poisonous to one's health.
- ❖ Keeping drugs in children's reach can easily cause child poisoning in homes.

Drug abuse;

- ❖ Is the use of a drug in way that is harmful to one's health drugs abused can be either legal or illegal.

Reasons why people abuse drugs.

- ❖ To quench thirst
- ❖ To improve performance
- ❖ To concentrate on work
- ❖ To feel warm
- ❖ To celebrate successes.

Effects of drug abuse;

- ❖ It can cause health damages to the body organs such as the brain, liver pancreas etc.
- ❖ Drugs abuse can cause abnormalities or improper body function.
- ❖ Drug abuse can easily result into death. It leads to divorce/spouse/child abuse.

Note: Drugs of dependency are drugs which cause addiction incase of prolonged use.

Drug dependency is when one's body becomes addicted to a certain drug.

Life skills to safe guard against drug dependency.

- ❖ Keeping busy with sports and games in free time
- ❖ Avoid peer groups which exercise the use of common drugs.
- ❖ Engage in good social clubs.
- ❖ Never wish to taste any drug any day.

LEARNERS ACTIVITY

1. What is drug abuse?

2. Why do people abuse drugs?

3. Give any two effects of drug abuse to an individual.

i) _____

ii) _____

4. Explain what is meant by the term drug dependence.

5. State any two life skills of safe guarding against drug dependency.

i) _____

ii) _____

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PRIMARY SIX

SCIENCE

MARKETING WORKBOOK

TERM II 2019

**ACOSMA
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THEME: THE WORD OF LIVING THINGS

TOPIC 1 : CLASSIFICATION OF PLANTS

FLOWERING PLANTS.

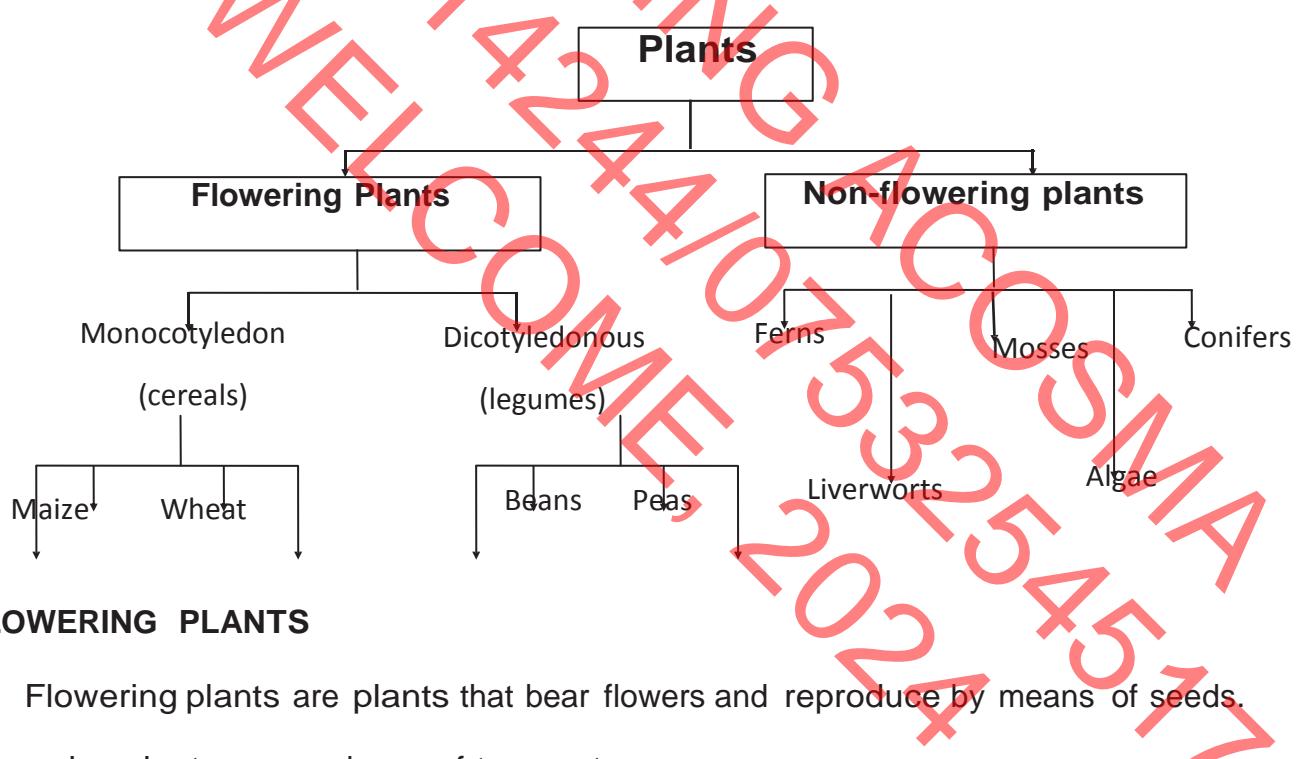
- ◊ Plants are living components of the environment
- ◊ A plant is a green growing living thing on the earth's surface
- ◊ Plants are the primary sources of food to animals

Classification of plants

Classification of plants means grouping plants according to their different characteristics.

Plants are classified into two;

1. Flowering plants
2. Non-flowering plants.



FLOWERING PLANTS

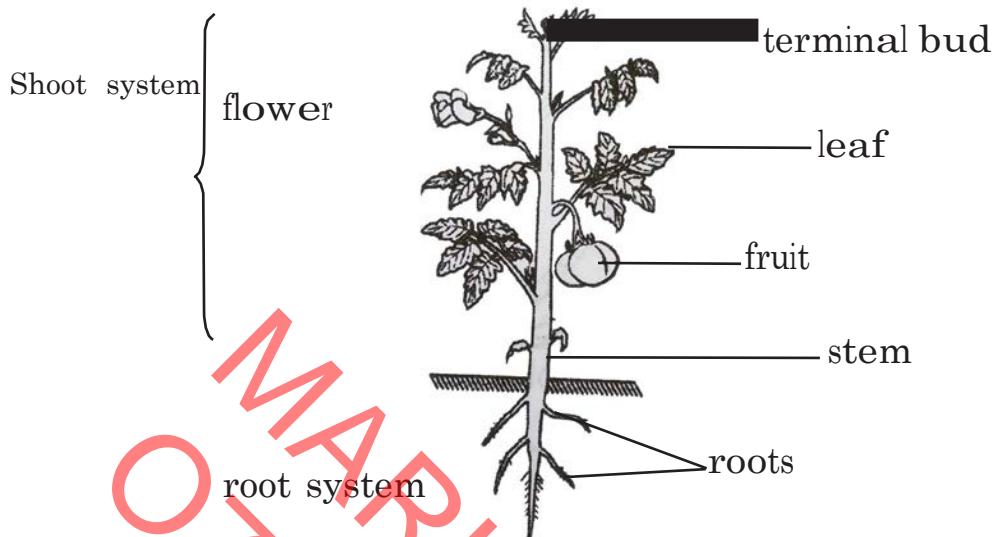
Flowering plants are plants that bear flowers and reproduce by means of seeds.

Flowering plants are made up of two systems

- I. Shoot system
- II. Root system

Shoot system is the part that develops from the plumule. It grows above the ground.

PARTS OF A FLOWERING PLANT



Flowering plants have both root system and shoot system

Flowering plants are sub-divided into two:-

Monocotyledonous and Dicotyledonous.

Monocotyledonous plants (cereals):

Monocotyledonous plants are plants that bear seeds with one cotyledon. They are also called **cereals**.

Examples of monocotyledonous plants:

- * Maize
- * Millet
- * Sorghum
- * Rice
- * Wheat

Characteristics of monocotyledonous plants.

- ◆ The seeds of monocotyledonous plants have only one cotyledon
- ◆ They have a fibrous root system.
- ◆ They have a parallel leaf venation
- ◆ Their seeds undergo hypogeal germination.

Dicotyledonous plants

These are plants that bear seeds with two cotyledons.

Examples of dicotyledonous plants

mangoes, oranges, beans, avocado, peas, ground nuts, soya beans.

Legumes

These are plants with root nodules on their roots and seeds in pods.

Examples of leguminous plants:

- * Beans
- * Ground nuts
- * Soya beans
- * Peas
- * Simsim

Characteristics of dicotyledonous plants.

- i. They have a tap root system.
- ii. Their seeds have two cotyledons.
- iii. Their seeds undergo epigeal germination
- iv. They have network leaf venation.

Learner's activity

1. In **one** sentence state what you understand by the term classification of plants

2. Name the **two** groups of plants

(i) _____

(ii) _____

3. Apart from root system, mention any other system of a flowering plant

4. Write **one** way in which roots are useful to;

(i) People : _____

(ii) Plants _____

Give **two** differences between cereals and dicots.

(i) _____

(ii) _____

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ROOTS:

The root system is the part that grows in the soil

The root system involves main root, lateral roots, root hairs and the root cap.

Types of root systems.

There are basically two types of root systems namely;

Tap root system

Fibrous root system

Tap root system

- ◊ Tap root grows directly from the radical of the germinating embryo
 - ◊ They are commonly found in dicots.

Fibrous root system

- ◊ Fibrous roots grow without a tap root or main root.
 - ◊ They are commonly found in monocots.

Draw structures showing parts of a tap root and fibrous root systems

The diagram illustrates two types of root systems. On the left, under the heading 'Tap root system', a plant is shown with a large, central taproot extending downwards from the main stem, which then branches into smaller lateral roots. Labels 'tap roots' and 'lateral roots' point to these respective parts. On the right, under the heading 'Fibrous system', a plant is shown with a dense, fibrous cluster of roots at its base, consisting of many small, thin roots radiating outwards from the stem.

Function of roots to a plant

- ◆ Roots hold the plant (shoot system) firmly in the soil
 - ◆ Root hairs absorb water and mineral salts from the soil
 - ◆ Some plants store their food in swollen roots.
 - ◆ Prop roots provide extra-support to plants
 - ◆ Breathing roots absorb oxygen especially in the mangroves.
 - ◆ Root nodules of legumes store nitrogen-fixing bacteria that improve soil fertility by fixing nitrogen into the soil.

NB: Mineral salts enter by a process called active transport.

Importance of roots to people:

- i) Swollen roots with stored food are sources of food to people e.g. Cassava, Sweet potatoes, & Carrots.
- ii) Some plant roots acts as herbs to cure some diseases e.g. Mangoes, Blackjack, Muringa plant, etc.
- iii) Big dry roots acts as source of wood fuel to people.
- iv) Some big roots can be used in making craft items.

Learners Activity

1. How useful is a shoot system to a plant?

2. In the space below, draw the structure of a tap root system

3. Apart from making craft items, state one way in which roots are useful to people

4. In **one** sentence, show the meaning of a flowering plant.

5. Give **two** examples of flowering plants

(i) _____

(ii) _____

CORRECTION

A large, tilted red banner with the text "WELCOME, 2024" at the top, followed by "ACOSMA" and "MARKETING" stacked vertically. Below the banner, the word "ROOTS" is written in bold black capital letters. To its right, the text "basically two types of roots namely:" is followed by a list: "primary roots", "secondary roots", and "adventitious roots".

TYPES OF ROOTS

There are basically two types of roots namely:

- i) Primary roots
 - ii) Secondary roots

Primary roots:

- ◊ Primary roots are roots that grow directly from the radical of a seed. Tap roots and fibrous roots are the examples of primary roots

Secondary rots

- ◊ Secondary roots are roots that develop from the other parts of a plant like the stem and leaves.
 - ◊ They mainly grow to give extra support to the plant with weak stems.

Examples of secondary roots include;

- a) Prop roots
- b) Aerial roots
- c) Breathing roots
- d) Roots of rhizomes and corms.
- e) Buttress roots
- f) Clasping roots
- g) Stilt roots

a. Prop roots:

Prop roots are common in cereal crops such as, maize, millet, sorghum and wheat.

They mainly grow to provide extra-support to the plant especially at the flowering stage.

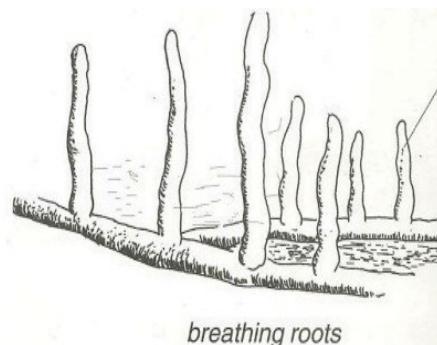
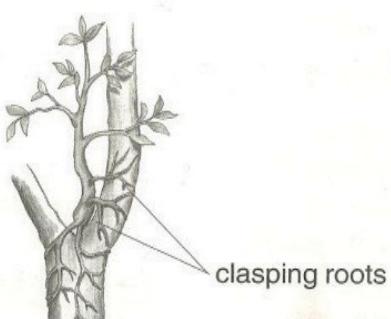
A structure showing the prop root system.



Note:

- ◊ Clasping roots enable plants with weak stems climb other plants and trap sunlight energy.
- ◊ Stilt roots are found on plants which commonly grow in muddy or swampy areas. They are also known as breathing roots.
- ◊ They take in air for respiration of roots. This is because soil with a lot of water does not have enough air

A structure showing clasping roots & Breathing roots



Note: some plants have swollen roots which store food for the plant.

Root tubers:

These are swollen underground roots that store food for the plant.

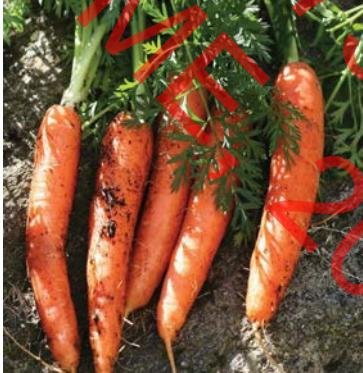
Examples of root tubers:

- * Cassava
- * beetroot
- * Carrots
- * radish
- * Sweet potatoes
- * turnips
- * Parsnips

Structure of root tubers:

Food stored by root tubers:

Root tubers store starch. They are good source of carbohydrates.

Cassava	carrot	Sweet potato
		

Learners Activity:

1. In **one** sentence explain the following terms

(i) Primary roots.

(ii) Secondary roots

2. Give two examples of secondary roots

(i) _____

(ii) _____

3. State the importance of prop roots to a plant

Draw a structure of prop roots

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PLANT STEMS

The stem is the biggest part of the shoot system of a plant.

It holds leaves, flowers, fruits, branches and terminal bud.

Functions of stems to a plant

- i. They hold and space out leaves to receive the sunlight energy
- ii. Stems transport water and mineral salts from the roots to the leaves
- iii. Green stems help in the process of photosynthesis
- iv. Stems conduct manufactured food in the leaves to all other parts of the plants.
- v. Stems hold flowers and fruits for easy pollination and dispersal
- vi. Some plant stems have thorns for protection

Functions of stems to people.

- i. Some plant stems act as a source of food to both people and animals
- ii. Big stems provide people with timber and poles for construction
- iii. Plant stems act as a local medicine to cure some animal diseases
- iv. Some plants are harvested to provide wood fuel to people
- v. Some plant stems are used for propagation i.e. cassava, sugarcane and some flowers.

Types of stems

1. Aerial stems – Upright/ erect, climbing, creeping
2. Underground stems
3. Climbing stems.

Underground stems

These are stems which grow from underground.

Examples of underground stems:

- Bulbs
- Rhizomes
- Corms

Note : Examples of upright stems include paw-paws, mangoes, maize, beans etc.

Examples of underground stems are; stem tubers, bulbs and corms.

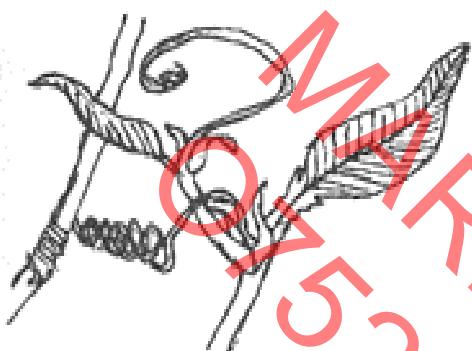
Climbing stems are weak stems of plants that cannot support themselves upright.

Plants climb others for support in order to get sun light energy.

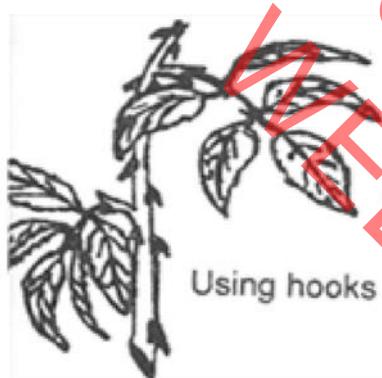
How plants climb others

Plants with weak stems climb other by;

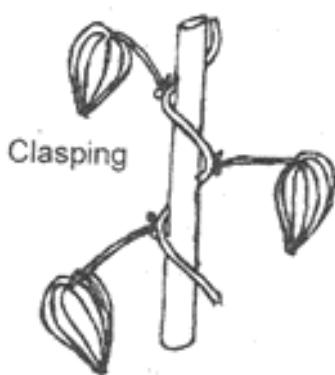
1. Use of tendrils



2. Use of hooks



3. Twining or clasping



Note:

- ⇒ Stem tubers are crops with underground swollen stems which store food.
- ⇒ Plants with such include; cocoyam and Irish potatoes
- ⇒ Rhizomes commonly grow horizontally under the ground with stored food. E.g. ginger and canally.
- ⇒ Corms grow vertically under the ground with stored food rich in carbohydrates.

Learner's activity:

1. In **one** sentence explain why plants climb others.
-

2. Using a diagram, show how plants climb others by clasping

3. Explain the term stem tubers
-

4. Apart from ginger and zoysia grass, mention any **one** other example of a rhizome.
-

5. Write any **two** ways in which stems are useful to;

(i) Plants

(i) _____

(ii) _____

(ii) People

(i) _____

(ii) _____

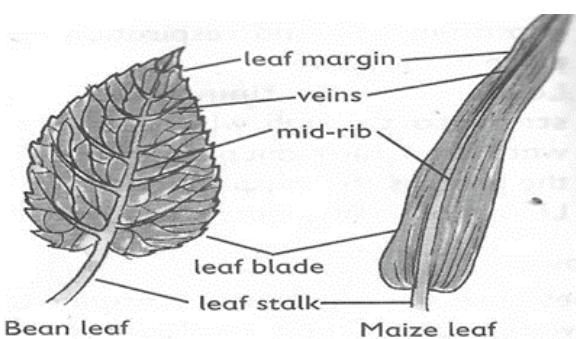
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PLANT LEAVES

- ◊ Leaves are the green parts of a plant with stomata for gaseous exchange.
- ◊ Leaves have chlorophyll to trap sunlight energy and manufacture its starch.
- ◊ Leaves also form the shoot system of a plant.
- ◊ A leaf is fixed between two internodes on a plant stem or branch.

A drawn structure showing a leaf.



Functions of the above parts.

- i. It has a surface area for easy trapping of sunlight energy by the help of chlorophyll
- ii. It's where the stomata are found.
- iii. It helps in the manufacturing of starch

a. Stomata

It's called stoma for singular and stomata for plural.

They are small holes on the leaf where gaseous exchange takes place.

b. Leaf veins.

They are hollow to allow distribution of water and nutrients within the leaf

c. Leaf apex.

It's the sharp tip part of a leaf to provide protection to the leaf

d. Leaf stalk / petiole

This provides attachment of the leaf to stem or a branch.

Note: there are mainly two processes that take place in plant leaves namely;

Photosynthesis and Breathing

Learners Activity

1. Identify **two** important processes that take place in plant leaves.

- (i) _____
- (ii) _____

2. Draw and name parts of a leaf

3. State the functions of the following parts of a leaf;

- (i) Veins _____
- (ii) Chlorophyll _____
- (iii) Petiole _____

4. How can plant leaves be useful to people?

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TYPES OF LEAVES

Types of plant leaves

1. Simple leaves
2. Compound leaves

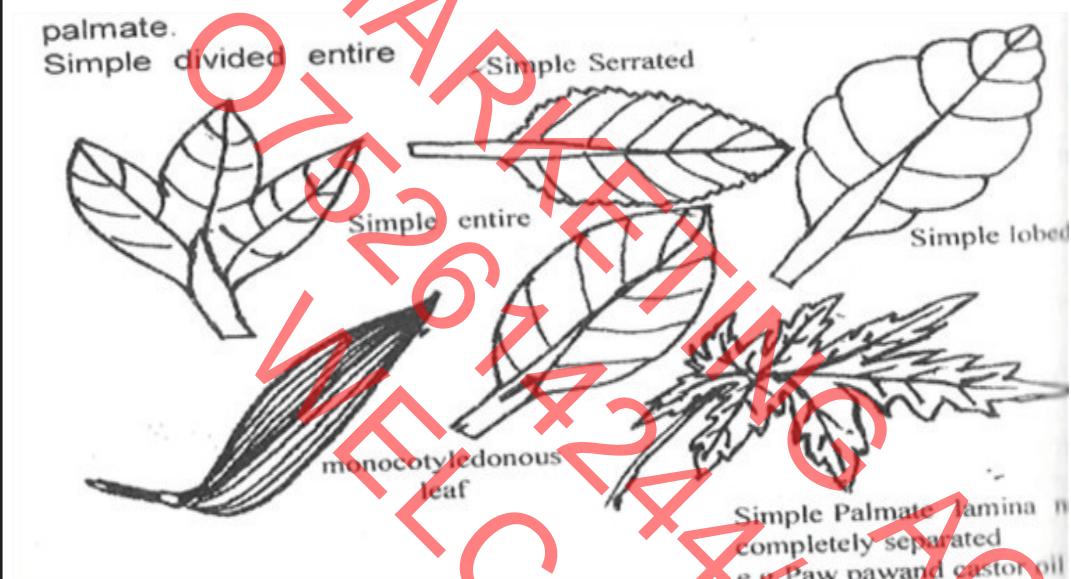
Simple leaves

Simple leaves are leaves that have one leaflet on each leaf stalk or lamina.

Examples of simple leaves include;

- ◊ Simple serrated leaf
- ◊ Simple palmate leaf
- ◊ Simple divided entire leaf
- ◊ Simple lobed leaf
- ◊ Simple entire leaf

Drawn structure showing different examples of simple leaves



Compound leaves

- ◊ Compound leaves have more than one leaf-let on one leaf blade or stalk.
- ◊ Each leaflet has a small stalk which is attached to a common leaf stalk.

Examples of compound leaves;

- ◊ Compound trifoliate e.g. Beans leaves
- ◊ Compound bipinnate. Jacaranda leaves/ mimosa plant
- ◊ Compound digitate leaf e.g. Silk cotton leaves
- ◊ Compound pinnate e.g. acacia leaves /eucalyptus

Drawn structures showing examples of compound leaves

Bipinnate	Pinnate	Trifoliate	Digitate
 Trifoliate three leaflets	 Pinnate	 Bipinnate	

Leaf venation

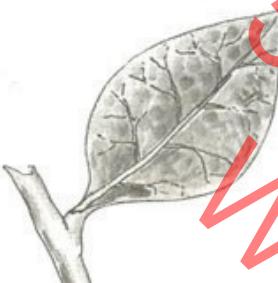
- ◊ Plant leaf venation refers to the arrangement of veins in a leaf.
- ◊ Veins in a plant leaf help in the distribution of water and mineral salts and translocation.

Types of leaf venations:

1. Network leaf venation
2. Parallel leaf venation

Network leaf venation is a characteristic of dicotyledonous plants.

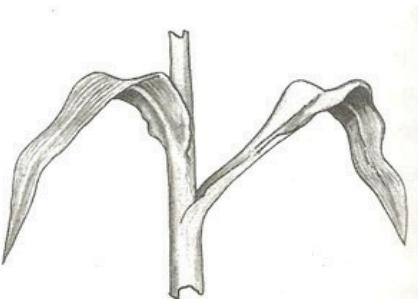
A drawn structure showing a network leaf venation of a plant leaf.



Note:

- ◊ Network leaf venation is common in both simple and compound leaves.
- ◊ Parallel leaf venation is a characteristic of monocotyledonous plants.

Drawn structure showing a leaf with parallel leaf venation.



Importance of leaves to people

- ◆ People eat leave as food.
- ◆ People use leaves as herbal medicine.

Importance of leaves to plants:

- ◆ Leaves are used for photosynthesis.
- ◆ Some leaves store food for the plant.

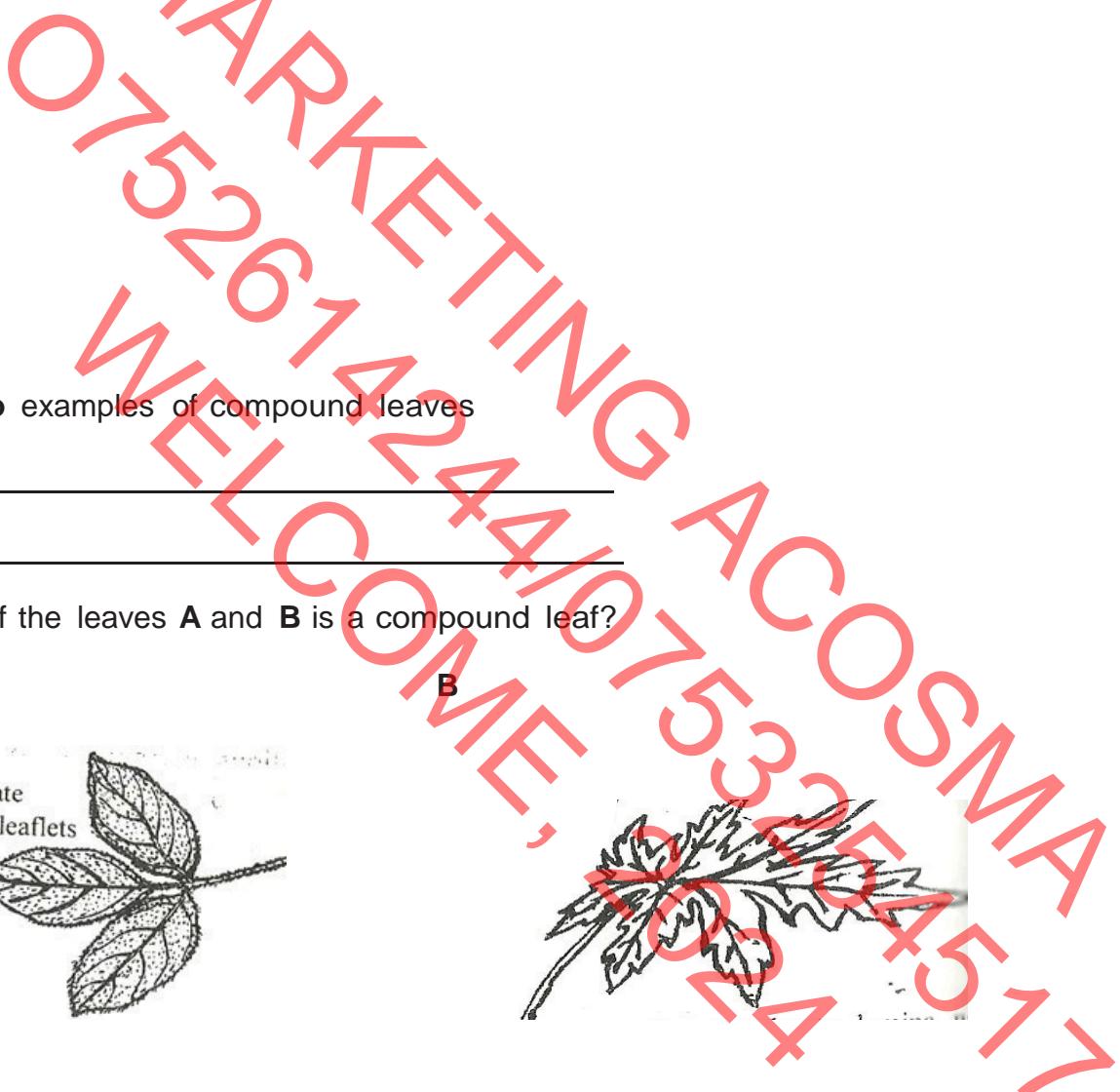
Learner's activity

1. Write **one** sentence to show the meaning of the following;

(i) Venation

(ii) Parallel venation

3. Draw the structure of a simple lobed leaf



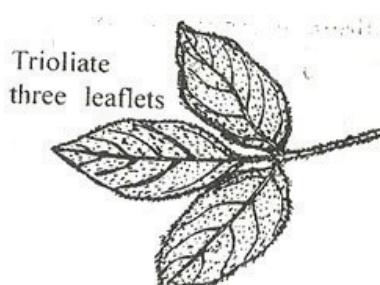
4. Give **two** examples of compound leaves

(i) _____

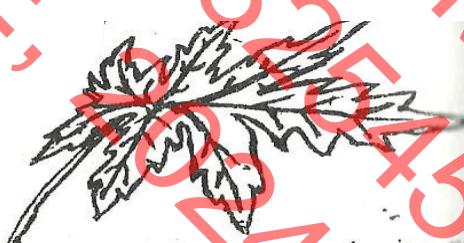
(ii) _____

5. Which of the leaves **A** and **B** is a compound leaf?

A



B



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PHOTOSYNTHESIS IN PLANTS

Photosynthesis in plants

- ◊ Photosynthesis is the process by which plants manufacture their own food by the help of sunlight energy.
- ◊ The word “photo” means light, “synthesis” means to make or “buildup”

Raw materials needed

There are two raw materials needed during the process of photosynthesis.

Water

Carbon dioxide gas

- ◊ This is synthesized to make carbon
- ◊ Both water and carbon dioxide combine to build up glucose stored in the plant leaves as starch.

Conditions necessary for photosynthesis

- ◆ Chlorophyll – to trap the sunlight energy
- ◆ Sun light energy – provides energy needed to speed up the formation of the starch.

Note:

- ◊ Oxygen is a by-product of photosynthesis while starch is the main product.
- ◊ Animals get oxygen from the process of photosynthesis.
- ◊ Photosynthesis cannot take place at night due to the absence of the sunlight energy.
- ◊ Photosynthesis is a chemical change in plants.

Learner's activity.

1. Write **one** word to refer to the process by which plants make their own food

2. Write any **one** raw material for the process above

3. State **one** way in which the following can be useful during photosynthesis;

(i) Sunlight

(ii) Water

4. Apart from oxygen, mention any other product of photosynthesis

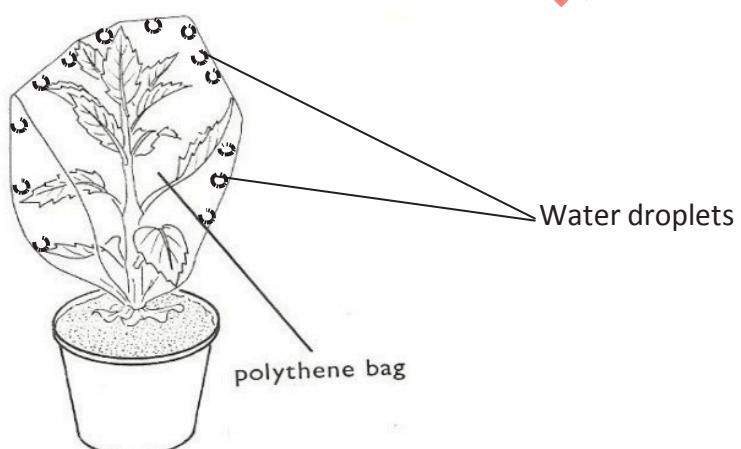
5. Briefly explain why photosynthesis cannot take place at night.

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LESSON4: TRANSPERSION IN PLANTS

- ◊ Transpiration is the process by which plants lose water as vapour into the atmosphere
- ◊ Transpiration takes place in plants through the stomata of leaves, lenticels and in the cuticle of stems.



Factors that affect the rate of transpiration in plants;

Wind

- ◊ Wind blows off the water vapour on the plant leaf giving chance or space for more vapour to come out. This increases the rate of transpiration.

Humidity:

- ◊ Humidity is the amount of water vapour in the atmosphere.
- ◊ High rate of humidity lowers the rate of transpiration and vice versa.

Temperature:

- ◊ High temperature during hot days causes plant leaves to lose a lot of water than on cool days.

Sunlight:

- ◊ Heat from the sun causes the opening of the stomata, lenticels and cuticle hence creating more chances of losing water.

Surface area of the leaf:

- ◊ Plants with small surface area of their leaves lose water at a lower rate than those with larger leaf surface area.

Number of stomata:

- ◊ The more the stomata, the higher the rate of transpiration and vice versa

Types of transpiration:

1. Stomatal transpiration
2. Cuticular transpiration
3. Lenticular transpiration

Note:

- ◊ **In stomatal transpiration** plants lose water through stomata.
- ◊ **In cuticular transpiration** plants lose water through the cuticle of stems.
- ◊ **In lenticular transpiration** plants lose water through lenticels.

Importance of transpiration to the environment

- i. Transpiration promotes capillary attraction.
- ii. Transpiration helps in cooling the plant during a hot day.

Importance of transpiration to the environment

The transpired vapour from the plants helps in the formation of rain.

Dangers of transpiration

- ♦ Excessive transpiration makes plants to dry (wilt)
- ♦ It lowers the crop yields due to less water left in the plant.

Ways plants reduce the rate of transpiration.

- Some plants reduce the rate of transpiration by shedding their leaves especially during dry season e.g. deciduous plants (Mvule, Oak& fig trees)
- Stems have tough cuticles and lenticels to guard against water loss.
- Some plants curl their leaves
- Some plant leaves have few stomata and distributed at the lower part of the leaf.
- Some plants have leaves with a small surface area to reduce transpiration.
- Leaves have a wax-like layer to cover their stomata to limit the water loss.

Learner's activity.

1. Briefly explain the term transpiration

2. Cite out any **two** factors that affect the process of transpiration

(i) _____

(ii) _____

3. Give **two** ways in which transpiration can be useful to a plant

(i) _____

(ii) _____

4. Explain any **two** ways in which transpiration can be a disadvantage to a plant.

(i) _____

(ii) _____

5. Make an illustrative drawing to show that a plant shoot transpires

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Buds:

- ◊ A small part on a plant that grows into flowers, branches and leaves

Types of buds

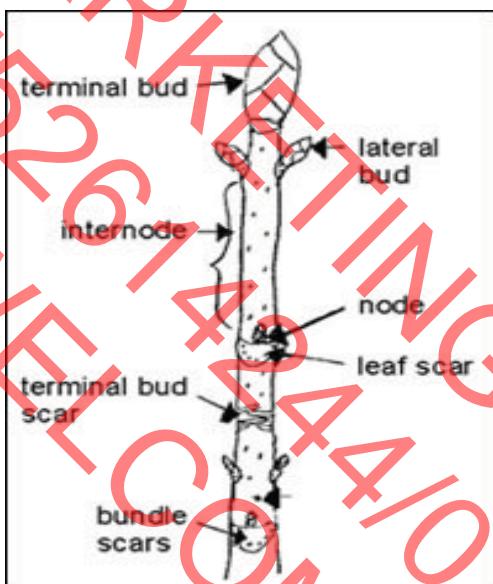
1. Terminal buds

- ◊ These are the main growing tips of a plant shoot.

2. Axillary buds

- ◊ These are buds which grow into branches and flowers.

Illustrations showing buds



Importance of buds to plants

- ◊ Buds develop into branches and flowers.

LESSON 5: FLOWERS

- ◊ The flower is the reproductive part of a flowering plant.

Pistil (female part)

- ◊ Pistil is made up of stigma, style, ovary and ovules

Illustration of a pistil:

Stamen (male part)

- ◊ Stamen is made up of the filament and anther head.
- ◊ The male reproductive cells are the pollen grains and female are the ovules.

Illustration of a stamen:

Drawn structure showing parts of a flower.



Functions of the parts

- a. **Petals**, the brightly coloured petals help to attract pollinating agents such as insects.

A group of petals is called **corolla**

- b. **Sepals**- Green sepals help to manufacture food for the plant.

Protect the inner parts of the flower at an early stage (bud stage)

A group of sepals is called **calyx**

- c. **Stigma**. Its function is to receive pollen grains

Pollen grains develop pollen tubes and grow down into the ovary

- d. **Style**: is a passage of the pollen grains to the ovary.

The style also supports / holds the stigma in position.

e. **Ovary.** It produces the female gametes called ovules.

A fertilized ovary develops into a fruit.

f. **Filament.** Holds the anther in position.

g. **Anthers.** Produce and store pollen grains.

Importance of flowers to plants

Flowers help plants to reproduce

Importance of flowers to people

- ◆ Some flowers are eaten
- ◆ Some flowers are used for decoration.
- ◆ Flowers are used to make perfumes.

Learner's activity.

1. What scientific name is give to a group of;

(i) Petals : _____

(ii) Sepals : _____

2. Of what importance are brightly coloured petals to a plant

3. Give **two** uses of flowers to human beings

(i) _____

(ii) _____

4. Draw and name parts of a female part of a flower

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LESSON 6: POLLINATION

- ◊ Pollination is the transfer of pollen grains from the anther to the stigma of a flower on a plant.
- ◊ Pollination helps to allow fertilization in plants
- ◊ The pollen grains are the male gametes while the ovules are the female gametes in plants.

Types of pollination

There are two types of pollination namely;

- i) Self pollination
- ii) Cross pollination

Self pollination:

Self pollination is the transfer of pollen grains from the anthers to the stigma of flowers on the same plant

Characteristics of flower that undergo self pollination:

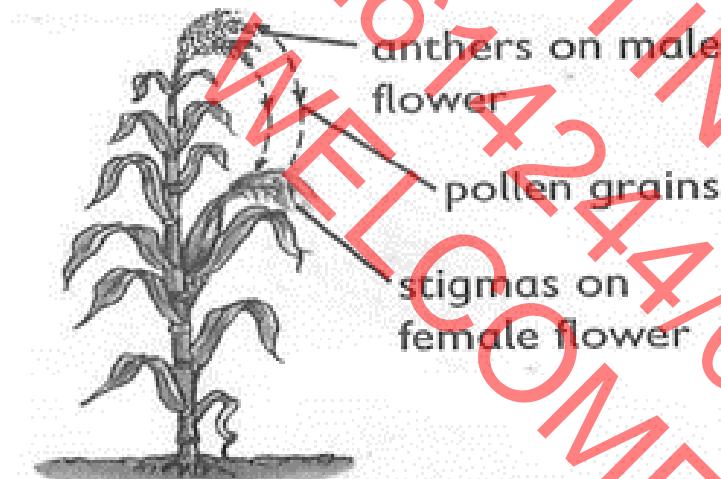
- ◆ Flowers with self pollination have shorter style compared to their filaments
- ◆ They also have brightly coloured petals to attract pollinators

Note:

Some flowers are adapted to self pollination by:

- * Both the anther and stigma maturing at the same time.
- * Their flowers remain closed until self pollination takes place

Structure illustrating self-pollination.



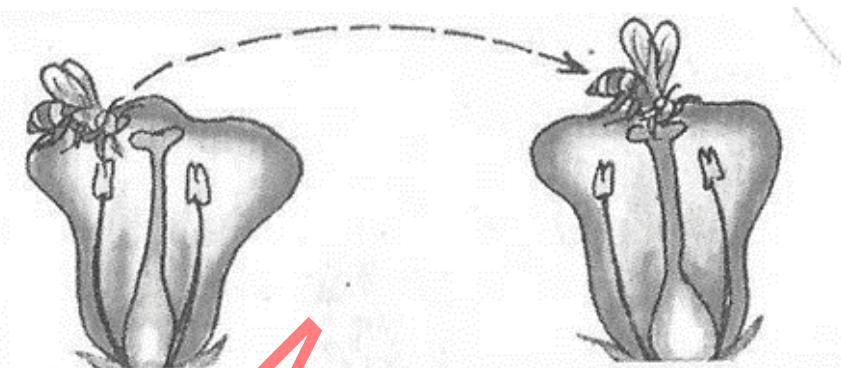
Cross pollination

- ◊ Cross-pollination is the transfer of pollen grains from the anther heads the stigma of a flower on another plant but of the same type or species.
- ◊ In cross-pollination, the filaments are shorter than the style.

Adaptation of some plant to cross pollination

- ◊ The anthers and stigma mature at different times e.g. maize plant.
- ◊ When pollen grains land of the stigma of the same flower they don't develop pollen tubes
- ◊ The male and female parts of a flower grow on different plants e.g. papaw plant

Illustration showing cross-pollination.



Agents of pollination:

Agents of pollination refers to the factors that are responsible or cause pollination to take place.

These include:-

- Wind
- Insects
- Birds

Note:

- ◊ Insects that pollinate flowers include; bees, butter flies and moths which pollinate flowers at night.
- ◊ Birds that pollinate flowers include; sun bird and humming birds

Characteristics of insect-pollinated flowers

- ◆ They have scent.
- ◆ They have brightly coloured petals.
- ◆ They produce sticky pollen grains.
- ◆ They have sticky stigma.

Characteristics wind pollinated flowers

- ◆ They produce a lot of pollen grains,
- ◆ They have no scent,
- ◆ They have dull petals
- ◆ They don't produce nectar.

Learner's activity.

1. Briefly explain the term pollination

2. Name the agents of pollination

3. Identify two factors that favour;

- ### (i) Self-pollination

(i)

(ii) _____

- ## (ii) Cross-pollination

(i) _____

(ii)

4. Give any **one** difference between insects and wind pollinated flowers

~~CORRECTION~~

SEEDS

- ◊ A seed is a fertilized ovule.
- ◊ A seed develops into a young plant or a seedling under favourable conditions.

Dicotyledonous seeds

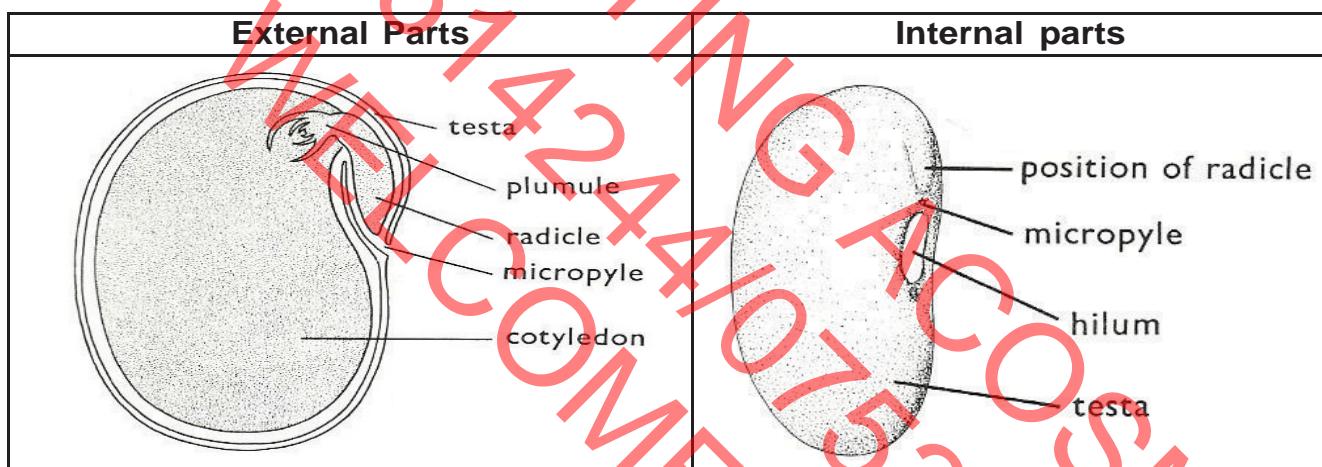
Dicotyledonous seeds are seeds with two cotyledons

Examples include:

- * Bean seeds
- * Peas
- * Groundnut seeds

NB: All dicotyledonous seeds undergo epigeal germination.

A drawn structure showing parts of external and internal parts of a bean seed.



Monocotyledonous seeds:

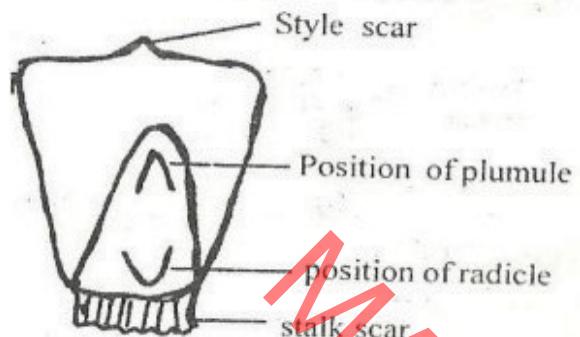
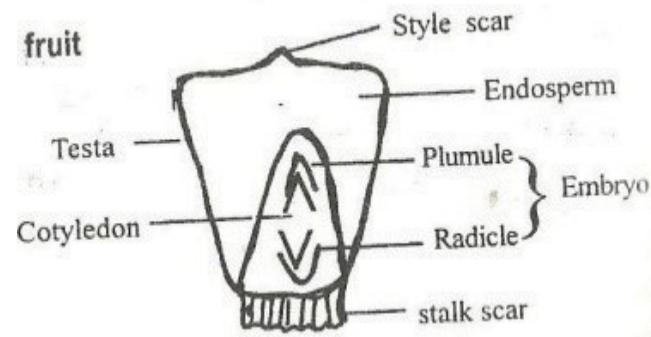
Monocotyledonous seeds are seeds with only one cotyledon.

Examples include:

- * Maize,
- * Millet,
- * Sorghum, etc.

NB: Monocotyledonous seeds undergo hypogea germination.

Drawn structures showing external and internal parts of a maize grain.

External parts	Internal parts
	

Functions of the above parts.

a. Seed coat (testa)

- ◊ It protects the inner delicate parts of the seed.

b. Cotyledon

- ◊ Absorbs stored food from the endosperm to the embryo during germination.

c. Endosperm

- ◊ Stores food in monocotyledonous seeds.

d. Plumule

- ◊ It grows into shoot system

e. Radicle

- ◊ Grows into the root system.

f. Micropyle

- ◊ Is a passage of air and water to the seed embryo.

Importance of seeds to plants:

- ♦ Seeds help plants to multiply in number.

Importance of seeds to people

- ♦ Seeds are eaten as food.
- ♦ People sell seeds and get money.

1. Why a maize grain is called a fruit?

2. Use **two** ways in which seeds are useful to people

(i) _____

(ii) _____

3. Draw and name the following parts of a bean seed.

(i) Micropyle

(ii) Hilum / scar

(iii) Testa

4. State the functions of the following parts of a maize grain.

(i) Endosperm :

(ii) Cotyledon :

(iii) Stalk scar :

5. State the functions of the following parts of a maize grain.

(i) Endosperm :

(ii) Cotyledon :

(iii) Stalk scar :

6. Draw and name the following parts of a bean seed.

(i) Micropyle

(ii) Hilum / scar

(iii) Testa

7. Write any **one** difference between monocotyledonous and dicotyledonous seeds

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GERMINATION IN PLANTS

Germination is the development of a seed embryo into a seedling.

Note:

During germination, the Radicle grows into the root system to support the seedling firmly into the soil.

The radicle also grows root hairs to absorb water and mineral salts from soil.

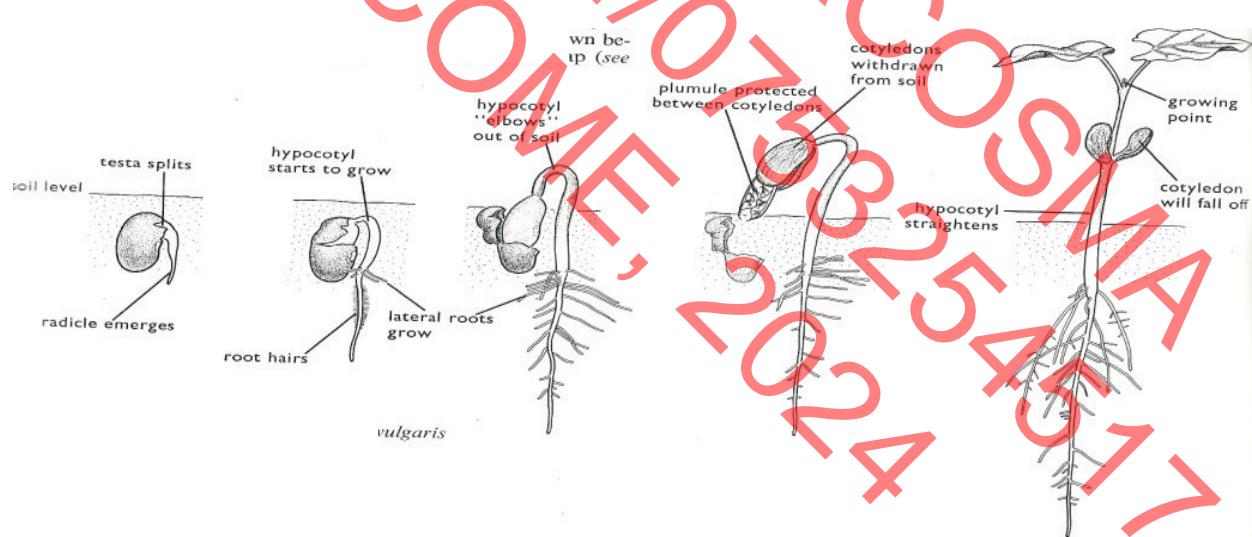
Types of germination

1. Epigeal germination
2. Hypogea germination

Epigeal germination:

- ◊ Epigeal germination is a type of germination where the cotyledon comes out of the ground.
- ◊ Epigeal germination is a common characteristic of dicotyledonous seeds e.g. Beans, soya beans, groundnuts.

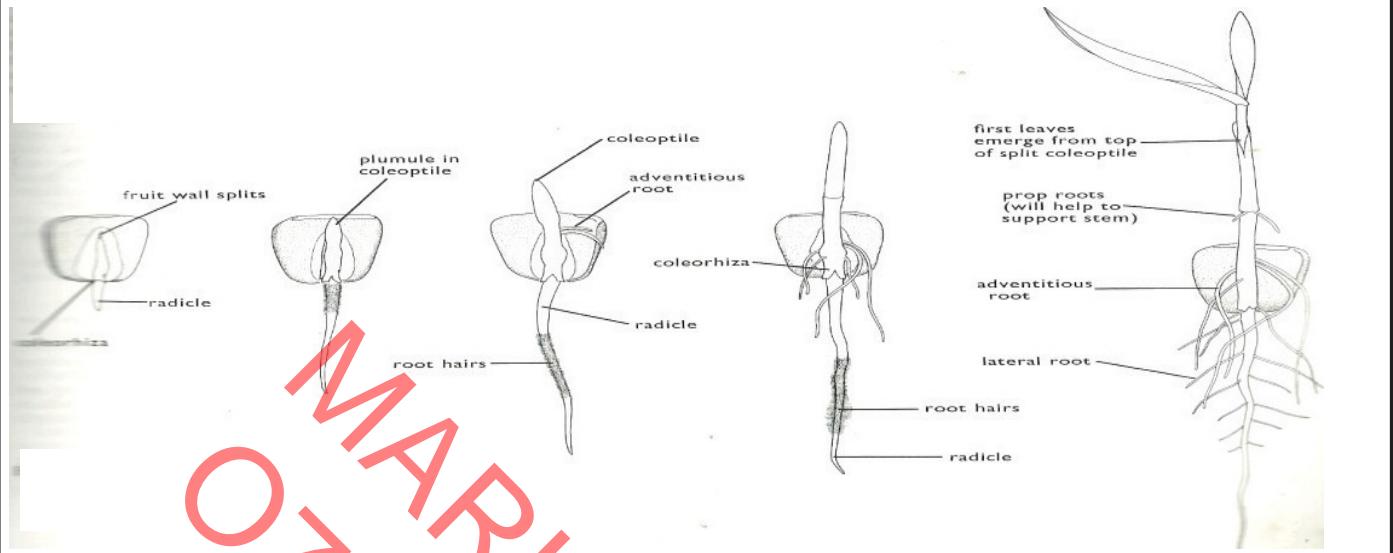
Diagram showing the different stages in Epigeal germination.



Hypogea germination:

- ◊ This is a type of germination in which the cotyledon remains under the ground
- ◊ This type of germination is a common characteristic of monocotyledonous seeds e.g. maize, millet, rice, sorghum

Stages involved in Hypogea germination.



Conditions necessary for seed germination.

1. Oxygen
2. Water
3. Warmth (Optimum temperature).

Seed viability:

Seed viability is the ability of a seed to germinate under favourable conditions.

A viable seed should be;

- ◆ Mature and dry
- ◆ Whole without a hole / wrinkles
- ◆ Healthy and of a good variety

Learner's activity.

1. State what you understand by germination of seeds

2. Point out any **two** conditions necessary for seed germination.

(i) _____

(ii) _____

3. Using diagrams, show the different stages of a germinating bean seed

4. List any **two** characteristics of a viable seed

(i) _____

(ii) _____

5. If a seed is not viable, it's said to be dormant. What does seed dormancy mean?

Tropism:

- ◊ Tropism is the plant's growth movement in response to stimulus (change in the environment)

Phototropism:

- ◊ This is the plant's growth movement towards the source of light.

Illustration:

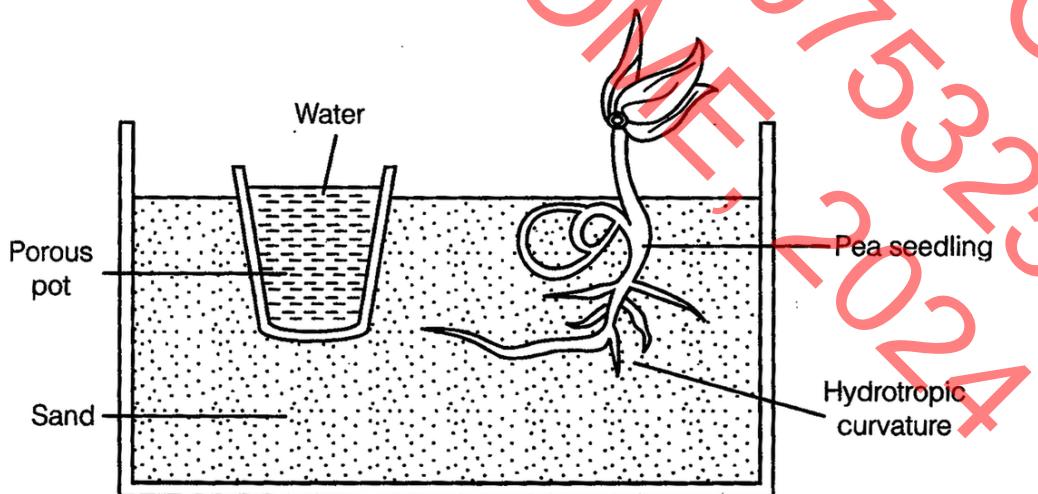


Fig. 6.19. Experiment to show phototropism.

Hydrotropism

- ◊ This is the plant's growth movement towards the source of water.

Illustration:



Geotropism:

- ◊ This is the plant's growth movement towards the direction of gravity force.

Thigmotropism:

- ◊ This is the plant's growth movement in response to the direction of touch.

Chemotropism

- ◊ This is the plant's growth movement towards the source of chemical.

FRUITS

- ◊ A fruit is a fertilized ovary
- ◊ A fruit is any structure in flowering plants that contains seeds
- ◊ A fruit has two scars i.e. style scar and stalk scar.

Fruits are divided into two;

- ◊ Succulent fruits (Juicy fruits)
- ◊ Dry fruits (Non juicy fruit)

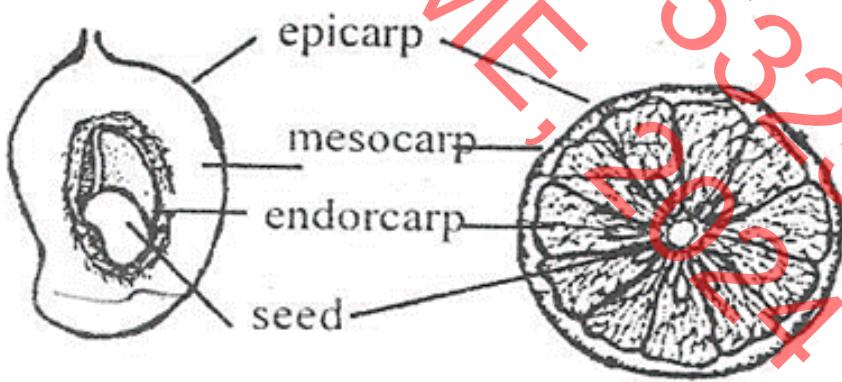
Succulent fruits

Succulent fruits are groups of fruits with juicy pericarps and are eaten.

These include berries, pomes and drupes

- ◊ Berries are succulent fruits with many seeds like guavas, tomatoes, oranges etc.
- ◊ Drupes are succulent fruits with only one seed such as avocado fruit and mango fruit.
- ◊ Pomes are succulent that develop from the receptacle

Drawn structure showing the different parts of a juicy fruit (mango and orange)



Dry fruits

These are fruits whose pericarp is usually dry hard and woody.

They are divided into two namely;

1. Splitting (dehiscent fruits)
2. Non-splitting (indehiscent fruits)

Splitting (dehiscent fruits)

Splitting fruits have capsule or pods that split to disperse their seeds when dry. E.g. Beans, peas and castor oil.

Non-splitting (indehiscent fruits)

- ◊ *Non-splitting fruits* have one seed only.
- ◊ Their pericarp does not split to disperse the seeds but have structures for their mode of dispersal. Eg. Black jack, maize, sunflower, tridax etc.

Note:

- ◊ Some fruits develop from one flower. They are called *simple fruits*.
- ◊ Sometimes all flowers on a stalk make one fruit. Such fruits are called *compound* or *multiple fruits* e.g. Pineapple.

Some fruits are not formed from the ovary of a flower but from some other parts of a flower. Such fruits are called *false fruits*. E.g. an apple which develops from a receptacle

Learner's activity.

1. Briefly explain the following terms;

(i) A fruit

(ii) Dehiscent fruits

(iii) Multiple fruits

2. Cite out **one** example of a false fruit

3. Write **one** way in which black jack is different from castor oil.

4. List **two** functions of fruits to plants

(i) _____

(ii) _____

5. Give **two** examples of juicy fruits

(i) _____

(ii) _____

CORRECTION

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SEED DISPERSAL

Dispersal is the scattering of seeds from the parent plant to other areas.

Agents of seed and fruit dispersal

- Animals
 - Wind
 - Flowing water
 - Self-dispersal or explosive mechanism

Importance/advantages of seed and fruit dispersal

- ◆ Dispersal enables plants to colonize new areas
- ◆ Dispersal reduces competition for light and the nutrients among plants.
- ◆ Dispersal increases the chances of the plant survival.

Types or mechanisms of seed dispersal are;

1. Wind dispersal
2. Animal dispersal
3. Water dispersal
4. Explosive mechanism.

Characteristics of seeds dispersed by animals

- ◆ They have juicy mesocarp
- ◆ Some have hook-like structures to attach them on the animals' bodies
- ◆ Some have hard seed coats to protect them from the digestive juices.

Examples of seeds dispersed by animals are;

- * Mango fruit
- * Guava fruit
- * Jack fruits
- * Avocado fruit etc.

Characteristics of seeds dispersed by wind

- ◆ Many are small and light to be easily carried by wind.
- ◆ Some seeds have wing-like structures for floating in air e.g. jacaranda
- ◆ Some have a parachute hair structure e.g. dandelion
- ◆ Some have a tuft of hair e.g. cotton seeds

Note:

Seeds dispersed by **explosive mechanisms** split their pods when ripe and disperse their seeds.

These include; castor oil, peas and beans.

Characteristics of Seeds dispersed by flowing water

- ◊ These seeds have numerous air spaces with an air tight covering
- ◊ Examples include; Water lilies and coconut fruits.

Learner's activity.

1. Write **one** word to mean the scattering of seeds from one mother plant to other areas

2. Write any **two** methods of seed dispersal

(i) _____

(ii) _____

3. Give **two** ways in which seed dispersal can be useful to plants

(i) _____

(ii) _____

4. List **two** differences between wind and animal dispersed seeds

(i) _____

(ii) _____

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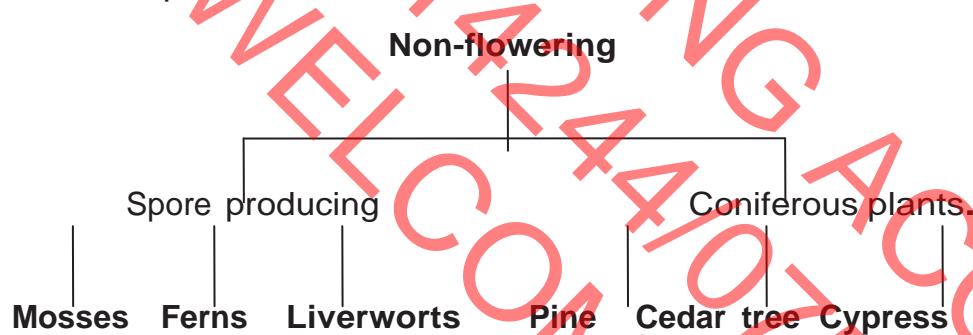
5. Draw the structure of a tridax

NON-FLOWERING PLANTS

Non-flowering plants are groups of plants that do not bear flowers.

Groups of Non-flowering plants

1. Spore producing.
2. Coniferous plants.



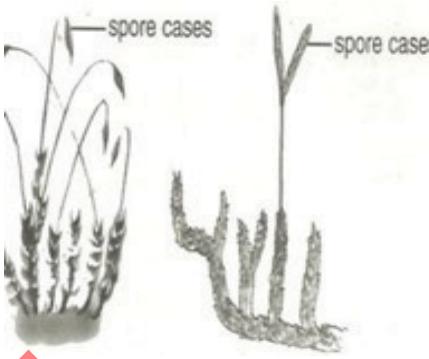
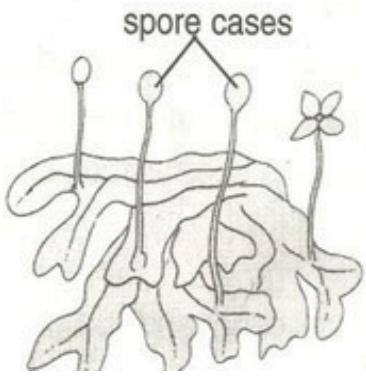
Spore producing:

- ◊ Spore producing plants are groups of non-flowering plants that reproduce by means of spores.
- ◊ A spore is a single cell that can develop into a new plant under favorable conditions.

Examples of spore producing plants include; liverworts, mosses and ferns.

- ◊ Ferns are the most advanced group of spore producing plants with proper leaves, stems and roots.
- ◊ Mosses are small green cushion-like and grow commonly on house roof verandas, tree trunks, and in damp soils.
- ◊ Liverworts have leaf like structures and commonly grow in wet moist places.

Illustrations showing different examples of spore producing plants.

Fern plant	Mosses plant	Liverwort plant
		

Note:

All spore producing plants are green and therefore able to make their own food.

Conifers or Coniferous plants:

- ◊ Coniferous plants are non-flowering plants that reproduce by means of seeds produced in hard structures called cones.
- ◊ Conifers have roots, stems and small needle shaped leaves

Examples of coniferous plants include

- | | |
|--------------|------------|
| * Pines | * Cypress |
| * Cedar tree | * Fir tree |
| * Podo tree | * Ginkgo |

Importance of conifers

- i. Some are planted in compounds to provide shade and also act as wind breaks.
- ii. Some conifers are planted around the compounds and farms to act as live fences
- iii. They are sources of soft wood timber

Learner's activity.

1. In **one** sentence show the meaning of non-flowering plants

2. Mention the **two** main groups of non-flowering plants

(i) _____ (ii) _____

3. Conifers cannot bear flowers. How do they reproduce?

4. State **two** ways in which coniferous plants can be useful to people

(i) _____

(ii) _____

5. Briefly explain why algae are not classified as plants.

6. How can algae be useful to an industrialist who deals in food processing?

~~CORRECTION~~

PLANT PROPAGATION

Propagation is a way obtaining a new plant from an existing plant.

Types of propagation

- ◊ Natural propagation (seed propagation) – involves the use of seeds for reproductive part of a plant

Vegetative propagation (artificial propagation)

This refers to asexual reproduction in which part of a plant used to obtain a new plant is not from a flower (productive part)

Types of vegetative propagation

- I. Natural vegetative propagation
- II. Artificial vegetative propagation

Examples of natural vegetative propagation

a. Use of suckers

- ◊ Some plants are propagated using suckers such as; bananas, pineapple and sisal

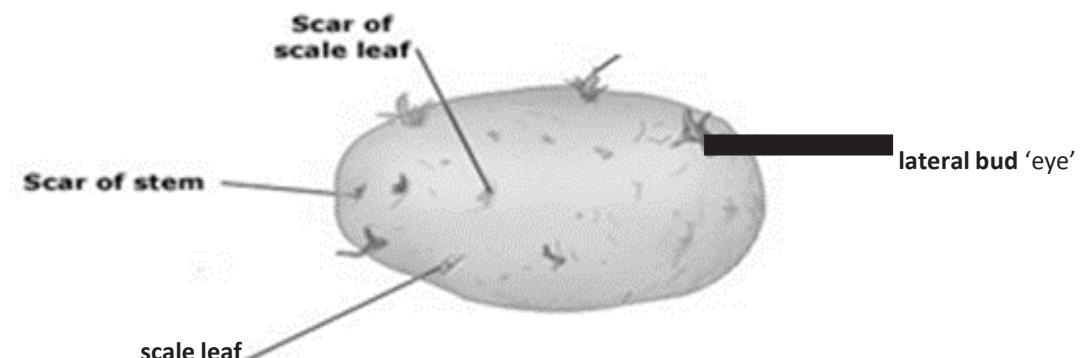
A structure showing a sucker of a banana plant.



b. Use of tuber

- ◊ Some plants are propagated using tubers such as; Irish potatoes, cocoyam.

A structure showing parts of stem tuber.



c. Use of corms

- Some plants are propagated with the help of corms (kind of underground stems) e.g. coco yams, gladiolus and crocus.

d. Use of rhizomes

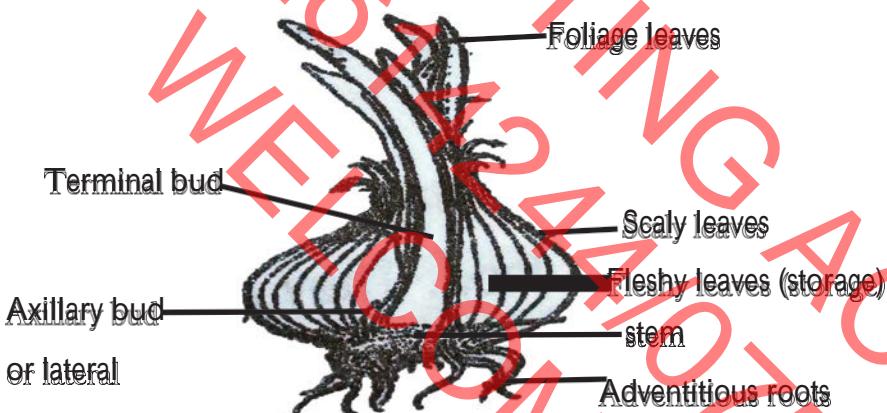
- Some plants are propagated using the rhizomes.
- Rhizomes are swollen underground stems with stored food and grow horizontally.

Example include, ginger, zoysia grass and turmeric.

e. Use of bulbs

- Some plants are propagated using bulbs such as onions
- A bulb is a short, thick underground stem with scaly leaves containing stored food.

A structure showing a bulb:



Examples artificial vegetative propagation

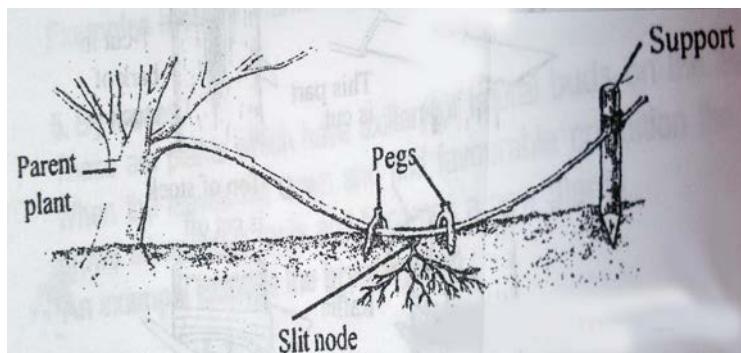
I. By stem cutting

- Some plants are propagated by using stem cutting such as cassava, sweet potatoes and sugar cane.

2. By layering

- Layering is when a shoot is pegged down to the soil

A structure showing layering



3. Marcotting

- ◊ Marcotting is a way of propagating plants by making a shallow cut at the node, covered with soil, adventitious roots grow from the cut then it is cut from the parent plant to another place.

A structure showing marcotting

4. By budding

5. By grafting

- ◊ This where a shoot of one plant with a bud is tied onto a stem of another plant and both continue to grow.

A structure showing grafting

Advantages of vegetative propagation

- i) In vegetative propagation plants mature in a short time.
- ii) The new plants maintain the original characteristics of the parent plant e.g. resistance to pests and diseases.

Advantages of seed propagation over vegetative propagation

Learners activity

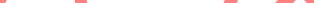
1. State what you understand by the term plant propagation

2. Give **two** methods of plant propagation

(i) _____ (ii) _____

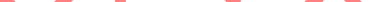
3. State how the following plants can be propagated;

(i) Sweet potatoes: _____

(ii) Sisal :  _____

4. Give two advantages of vegetative propagation over seed propagation.

(i) _____

(ii) 

5. Name any ~~one~~ crop raised in a nursery bed.

~~CORRECTION~~

TOPIC 2 : KEEPING CATTLE

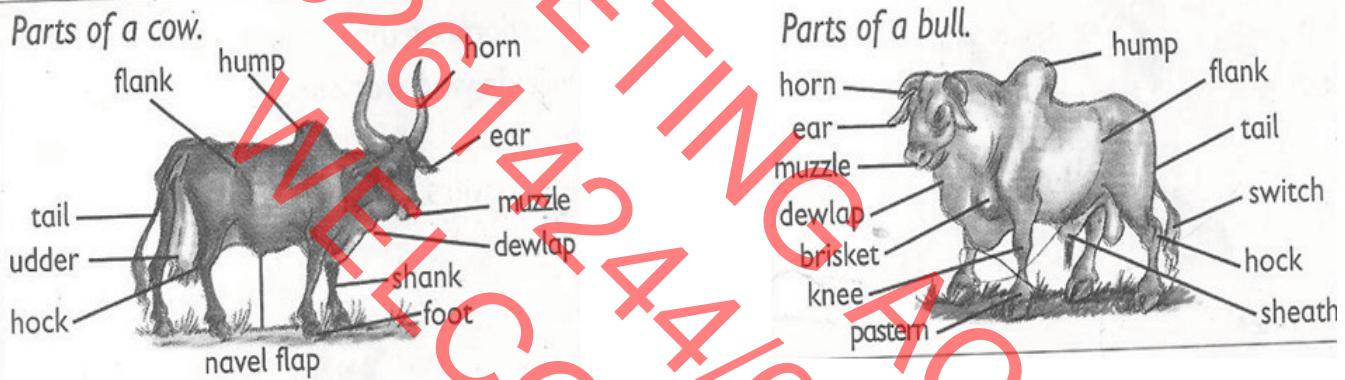
IMPORTANCE OF KEEPING CATTLE

- ◊ Keeping cattle refers to the act of rearing bulls, cows, calves and heifers.
- ◊ Animal husbandry refers to the act of rearing farm animals or livestock.

Farm animals include:-

- * Pigs
- * Sheep
- * Goats
- * Cattle
- * Rabbits

A drawn structure showing the external features of a cow and a bull.



Importance of keeping cattle.

The following are the reasons why people keep cattle;

- ◆ Cattle provide people with milk and meat which are sources of proteins.
- ◆ Waste materials (dung) from cattle acts as natural manure used to improve soil fertility
- ◆ Hooves and horns are used to make enamel items like plates and cups.
- ◆ Hides from cattle are used in making leather products.
- ◆ Cow dung can be used in building local houses and making biogas
- ◆ Keeping cattle is a source of employment.

Learner's activity.

1. Write one sentence to show the meaning of the following terms;

(i) Keeping cattle

(ii) Animal husbandry

2. State **one** reason why many Ugandans have taken up cattle keeping as a business

3. What is the importance of horns and hides to an industrialist

~~CORRECTION~~

TYPES OF CATTLE

A type of cattle is a class of cattle kept for a specific purpose. Specific purpose may be;

- ◆ For milk production
 - ◆ For meat (beef) production
 - ◆ For provision of animal labour
 - ◆ For both milk and meat production

Types of cattle

There are basically three types of cattle namely;

- I. Dairy cattle – kept for milk production
- II. Beef cattle -- kept for beef (meat) production
- III. Dual-purpose cattle -- kept for both milk and meat production.

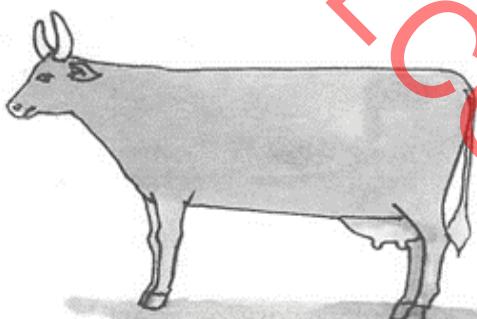
1. Dairy cattle

- ◊ This is a type of cattle kept specifically for milk production.

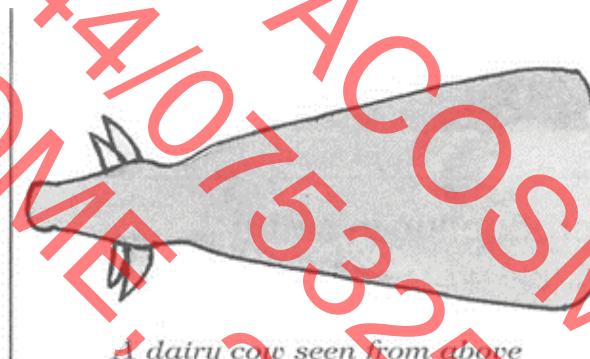
Characteristics of dairy cattle.

- ◆ They produce much milk.
- ◆ They have a triangular shape.
- ◆ They have big (large) udders.
- ◆ They have small necks.
- ◆ They have long legs.

A drawn illustration showing body shape of dairy cattle.



A dairy cow seen from the side



A dairy cow seen from above

Examples of dairy cattle include.

- * Friesian
- * Ayrshire
- * Guernsey
- * Jersey
- * Jamaican hope
- * Brown Swiss cattle.

2. Beef cattle

This is a type of cattle kept mainly for beef production.

Characteristics of beef cattle;

- ◆ They produce little milk.
- ◆ They have a rectangular body shape.
- ◆ They produce much meat.
- ◆ They have small udders.
- ◆ They have large necks.
- ◆ They have short legs.

An illustration showing the body shape of beef cattle.



Examples of cattle kept for meat production include;

- ◊ Aberdeen angus (weighs 720-900kgs)
- ◊ Hereford (weigh about 1000kgs)
- ◊ Charolais (creamy in colour)
- ◊ Beef shorthorn
- ◊ Galloway (it's small and long haired black)
- ◊ American brahman cattle

Dual purpose cattle

These are groups of cattle kept for both milk and meat production

Examples include

- ◊ Sahiwal (its brown –red in colour and large in size)
- ◊ Red poll (has a medium size with no horns)
- ◊ Milking short horn (don't grow very fast like others but produce hard meat)

Note:

Dual Purpose Cattle have characteristics of dairy cattle and beef cattle

Learner's activity

1. What do you understand by the term type of cattle?

2. List any **two** types of cattle

(i) _____ (ii) _____

3. Identify the type of cattle with a rectangular body shape

4. Give two examples of dairy breeds of cattle

(i) (ii)

5. Name the commonest exotic dairy breed of cattle reared in your locality

BREEDS OF CATTLE

A breed of cattle is a family or group of cattle having specific characteristics.

Specific characteristics may include;

- ◆ Colour of cattle
- ◆ Size of the animals
- ◆ Productivity of the animals.

Types of Breeds of cattle include;

- Local breeds of cattle (indigenous)
- Exotic breeds of cattle
- Cross breeds

Local breeds of cattle (indigenous)

- ◊ Local breeds or indigenous cattle are breeds of cattle that have lived in East Africa for a long time. They are also called the native breeds kept for both milk and meat production.

Examples include;

- * Small east African zebu
- * Boran cattle.
- * Nsagala or sanga cattle
- * Ankole cattle

Characteristics of local breeds of cattle.

- ◆ They are resistant to tropical diseases
- ◆ They have the ability to walk long distances
- ◆ They can withstand harsh weather conditions
- ◆ They can survive on poor pasture and less water

Disadvantages of local breeds of cattle

They produce less meat and milk

They have a slow growth rate

They produce less products (meat and milk)

Exotic breeds of cattle

- ◊ These are groups of cattle breeds imported into East Africa.
- ◊ They are either dairy, beef or dual-purpose cattle

Examples include;

- ◊ Friesian, Ayrshire, Guernsey Jersey, Jamaican hope, brown swiss, Aberdeen angus, Hereford, Charolais, Shorthorn, Galloway and American beef master

Characteristics of exotic breeds of cattle.

- ◆ They grow quickly with no horns
- ◆ They are not resistant to diseases.
- ◆ They need a lot of attention or care.
- ◆ They produce high quantities of milk and beef
- ◆ They need a lot of water and good pasture

Note:

Cross breeds are obtained after mating a local breed with an exotic breed.

- ◊ This is the best way of improving upon the poor local breeds of cattle.

Learner's activity.

1. Give the difference between a breed of cattle and a type of cattle

2. Mention any **two** breeds of cattle commonly kept in Uganda

(i) _____ (ii) _____

3. Identify a breed of cattle you would prefer to keep in your locality

4. Give a reason for your answer in (3) above

5. Cite out the best way of improving on our local breeds of cattle

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LESSON4: BREEDING IN CATTLE

Breeding

This is the act of maintaining or improving the desired characteristics in cattle.

Desired characteristic may include;

- ◆ Size of the animal.
- ◆ Resistance to diseases.
- ◆ Animal's skin colour
- ◆ Productivity of the animals

Types of breeding

- i) Line breeding
- ii) Inbreeding
- iii) Cross-breeding
- iv) Out breeding
- v) Upgrading

1. **Line breeding** is the act of mating closely related animals such as cousins.

This type may result into poor production in animals

2. **Inbreeding** is the continuous mating of very closely related animals such as brother and sister animals.

This method if not properly practiced, it may also produce poor quality animals.

3. **Out breeding** is the practice of mating distantly related animals

This method helps to restore the qualities in cattle that may be disappearing from a flock.

4. **Cross breeding** is the practice of mating a local breed with an exotic breed of cattle.

After cross breeding, a cross-breed is obtained or a hybrid.

Cross-breeding helps to improve animals with poor qualities

5. **Upgrading:** this is the act of improving upon the qualities of one breed by using a male animal of superior qualities several times.

Importance (advantages) of breeding

- ◆ Breeding helps to improve animals with poor qualities
- ◆ Breeding helps to obtain hybrids.
- ◆ Breeding helps to maintain good characteristics in animals

Learner's activity

1. In **one** sentence show the meaning of breeding as used in cattle keeping

2. List down **two** types of breeding in cattle

- (i) _____ (ii) _____

3. State why inbreeding is discouraged in the management of cattle breeding

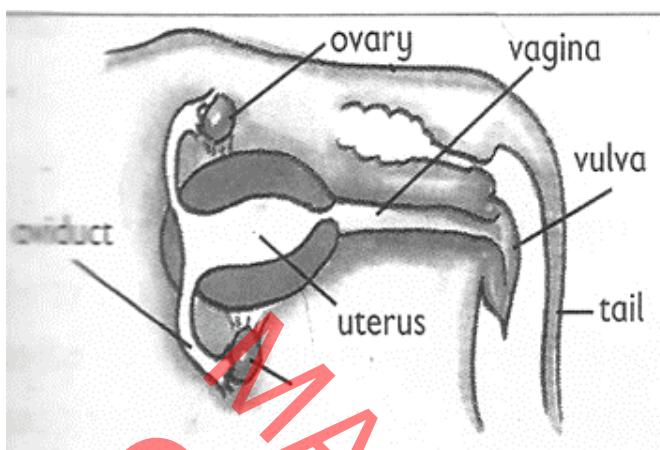
4. How can a local farmer improve on his local breeds of cattle

5. Briefly describe how a hybrid is obtained.

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The reproductive system of a cow.



Functions of different parts

Vulva: receives and guides the penis

Vagina: it's where semen is deposited

Cervix: closes the lower end of the uterus during pregnancy

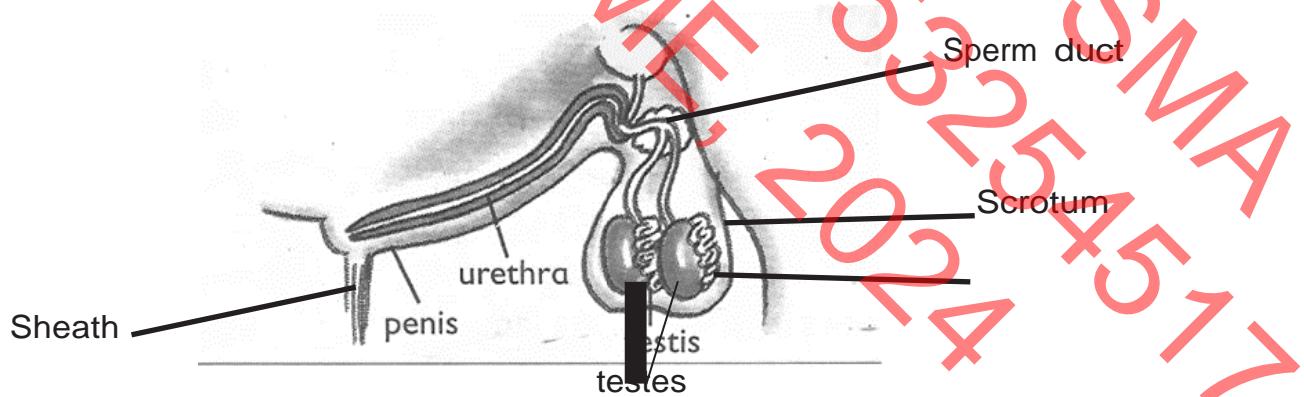
Ovary: produces the ova and hormones that help to control the sexual cycle

Ova: are the reproductive cells produced by the ovary

Oviduct/fallopian tube: Is the place where fertilization takes place.

Uterus: it's where implantation takes place (development of the foetus)

Reproductive system of a bull



Functions of parts **Testes-**

produce sperms **Sperm**

ducts – carry sperms

Urethra– passes out urine and sperms

Penis – delivers semen in the vagina of a cow

Learners Activity

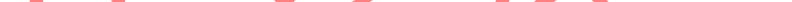
1. Draw the female reproductive system of a cow and name the following parts

- (i) Oviduct
 - (ii) Vulva
 - (iii) Uterus

2. Using an arrow, show on your diagram the part where implantation takes place.

3. Write the function of the following parts of the system;

i. Cervix :

ii. Testis : 

ii. Testis : _____

iii. Overview

III. Ovary : _____

~~CORRECTION~~

LESSON 6: HEAT PERIOD AND INSEMINATION (SERVICES)

Heat Period (oestrus)

- ◊ This is the time when a cow is in need of a bull for mating.
- ◊ Mating takes place only when a cow is on heat.

Signs of a cow on heat

- ◆ The cow becomes restless
- ◆ The cow mounts other cattle and stands still when bulls mount it
- ◆ The cow urinates frequently
- ◆ The cow puts its tail on the side to enable its vulva to be seen
- ◆ There is a mucus discharge from the vulva
- ◆ Its vulva swells and changes its colour
- ◆ There is a drop in its milk production
- ◆ The cow makes a lot of noise (Bellows frequently)

Insemination (service)

- ◊ *Insemination or service* is the act of depositing sperms into the reproductive organ a female animal.

Types of insemination

- i) Natural insemination
- ii) Artificial insemination

Hand mating

- ◊ This means bringing a bull to mate with a cow on heat.

Pasture Mating

- ◊ This means allowing a bull to move with cows so that it mates easily with those on heat.

Advantages include:

- ◆ Natural insemination saves time
- ◆ It does not need a trained inseminator in order to carry it out.

Disadvantages

- ◆ More sperms are wasted in one cow.
- ◆ It's very expensive to buy and maintain a bull
- ◆ Big bulls can cause injuries to weak cows
- ◆ Once the bull dies, sperms are also lost.

Artificial insemination

- ◊ Refers to the act of depositing semen in the vagina of a female animal of (cow) by the help of a trained veterinary officer.
- ◊ Semen used is got from healthy bulls and with desired characteristics.
- ◊ Sperms are deposited into the vagina using an insemination syringe.

Advantages

- i. It reduces the cost of keeping many bulls on the farm,
- ii. It's cheaper to buy semen than buying and maintaining a bull.
- iii. It prevents injury to small cows and heifers by bigger or heavy bulls.
- iv. It helps to control inbreeding and unwanted pregnancies in cattle
- v. It promotes selective breeding.

Disadvantages:

- i) It's difficult and expensive to maintain proper storage of sperms.
- ii) It can't be applied to animals whose signs of heat can't be easily identified.
- iii) It requires a trained experienced inseminator

Animals are denied chance to enjoy mating

Learner's activity

1. Briefly explain the term insemination

-
2. Give **two** ways in which natural insemination can be dangerous to a livestock farmer

- (i) _____
- (ii) _____

3. How does artificial insemination control unwanted pregnancies on a farm.

4. Identify **three** signs of a cow on heat

(i) _____

(ii) _____

(iii) _____

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Fertilization in a cow

- ◊ Fertilization is the union of male and female gametes to form a zygote.
- ◊ A gamete is a reproductive cell.
- ◊ The female gamete is called Ovum
- ◊ The male gamete is called a Sperm.

Diagram of a sperm and an Ovum

Sperm

NB:

- ◊ After fertilization, the zygote develops into an embryo.
- ◊ The embryo develops into a foetus and finally into a calf.

Zygote → Embryo → Foetus → Calf

The embryo is attached to the uterus wall through the placenta.

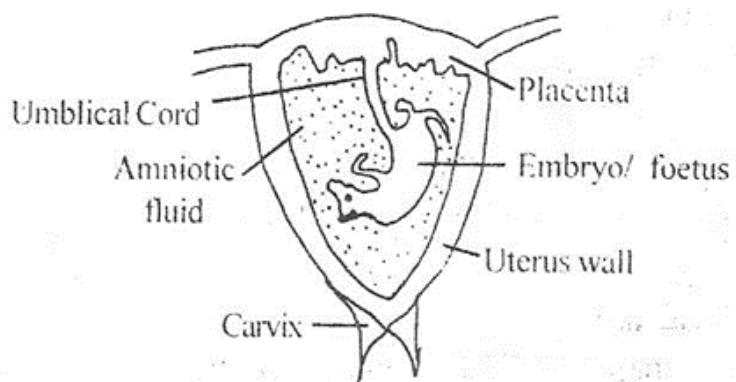
Implantation

- ◊ This is the attachment of the foetus to the walls of the uterus.

Gestation period

- ◊ This is the time between conception and giving birth.
- ◊ The gestation period of an in-calf is 270-280 days or nine months.
- ◊ An in-calf is a cow that is pregnant.

An illustration showing developing foetus



Note:

The placenta supplies oxygen and digested food to the foetus and also stores water from the foetus temporarily.

Umbilical cord is a passage of food and oxygen to the foetus

Umbilical cord also transports wastes from the foetus to the placenta.

Amniotic fluid acts as a shock absorber for any external pressure.

Signs of pregnancy:

- ◆ The uterus enlarges in the second and third month after conception.
- ◆ The udder enlarges and fills with milk.
- ◆ The cervix closes during pregnancy.
- ◆ The movement of foetus can be seen or felt after 7 months.

Steaming up

- ◊ This is the feeding of an in-calf on foods rich in protein. It is normally done during the last two months.

Why steaming up/advantages of steaming up

- ◆ It encourages the foetus to grow healthy.
- ◆ It builds a cow's body in preparation for calving (parturition)
- ◆ It increases the manufacture of colostrums.
- ◆ It prevents low birth weight.
- ◆ It prolongs gestation period

Dry period

- ◊ This is the time when a lactating cow is left without milking it in preparation to giving birth.
- ◊ A cow is dried six to seven weeks before calving.
- ◊ During the dry period, the in-calf is fed on foods rich in protein.

Calving or parturition

This is the act of giving birth in cattle (cows).

Signs of calving

- ◆ The vulva swells and becomes red.
- ◆ The cow lies down most of the time.
- ◆ The udder and teats become swollen.
- ◆ The amnion (or water sac) busts and comes out

Colostrums

This is the first milk got from a cow which has given birth.

Uses of colostrums

- It has all food values needed by a young animal.
- It opens up the digestive system of a calf.
- It boosts the immunity of a calf since it is rich in antibodies.

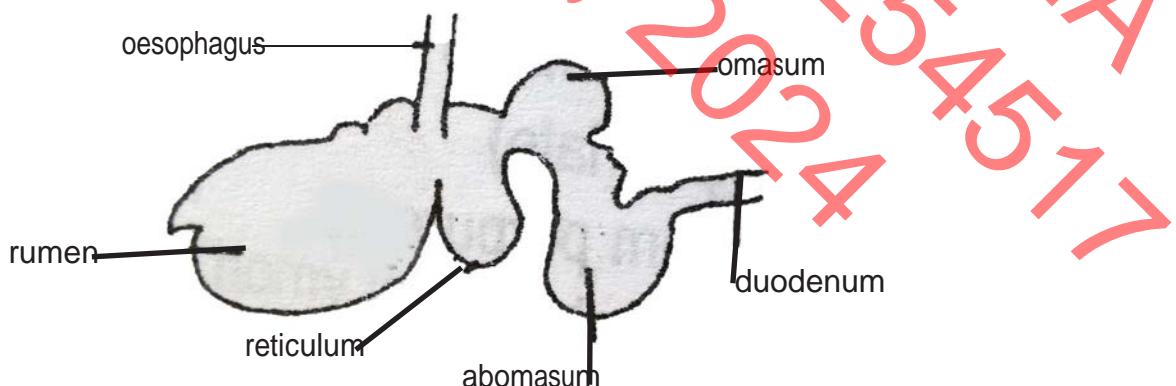
GRAZING /FEEDING IN CATTLE

FEEDING IN CATTLE

The digestive system (stomach) of a cow (cattle)

- ◊ Cattle, sheep and goats are ruminant animals. They chew cud.
- ◊ They have four chambered stomachs. I.e. Rumen(pouch), Reticulum (honey comb), Omasum and Abomasum

Illustration showing the stomach of a ruminant:



Functions of the parts:

1. Oesophagus (gullet)

- ◊ This is the passage through which food (roughage) moves from the mouth to the rumen.
- ◊ Food (roughage) move by the process of wave like movement called peristalsis.

2. Rumen (pouch)

- ◊ The rumen is the largest of the four stomachs
- ◊ It stores roughage temporarily before it is returned to the mouth for rumination (chewing cud)

3. Reticulum (honey comb)

- ◊ This is second stomach where bacterial action takes place.
- ◊ It separates chewed materials from coarse ones.

4. Omasum

- ◊ This is the third stomach. Its where absorption of water from food takes place.

5. Reticulum

- ◊ This is the fourth stomach. It is called True stomach
- ◊ This is where chemical digestion takes place.

Types of food stuffs

(i) Forages:

These include hay (dried grass), pasture or green grass, legume, silage, (fermented grass) straws.

(ii) Concentrates:

These include cereals, oilseeds and legume seeds.

(iii) Supplements:

These include proteins and vitamins added to feeds.

(iv) Additives:

These can be drugs and flavors added to feeds.

Other feeds given to animals:

Maintenance rations:

These are feeds given to animals to sustain their usual foods.

Production rations:

These are extra feeds given to cattle for production of beef or milk.

Salt supply:

This is salt given to animals to stimulate milk production.

Note:

Intake – This refers to the amount of food eaten by an animal.

Methods of grazing

There are three main methods of grazing cattle namely;

- i) Rotational grazing
- ii) Zero grazing
- iii) Herding or free range system

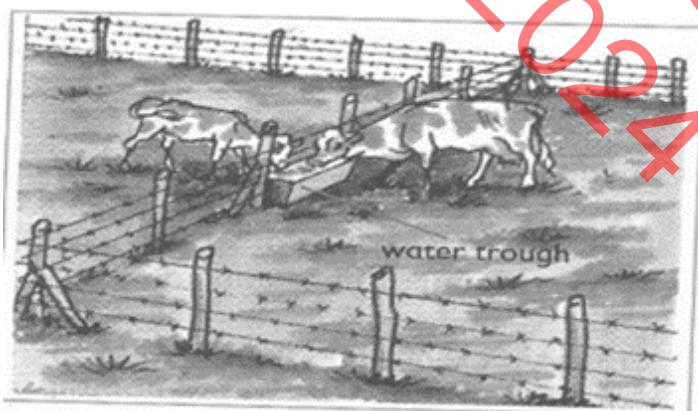
a. Rotational grazing

- ◊ This is the type of grazing where animals graze on one portion of pasture at a time. This can be done using the following systems;
 - i. Paddock grazing
 - ii. Strip grazing
 - iii. Tethering

b. Paddocking

- ◊ This is when a farmer feeds his animals on pasture land divided into sections (paddocks) using a female
- ◊ Cattle are fed on grass in a paddock and when the grass is no longer enough they are moved to another paddock.

An illustration of paddock grazing



Advantages of paddock grazing

- ◆ Paddocks help to control overgrazing
- ◆ Paddock grazing controls pests and diseases
- ◆ Paddock grazing enables the animals to have grass all the time.
- ◆ It lessens the labour used to look after the animals after setting up paddocks.
- ◆ Paddocks help to control the spread of diseases
- ◆ The dung and urine of the animals are evenly distributed. This allows for new grass to grow well in all paddocks.

Disadvantages of Paddocking

- The materials needed are expensive
- Animals have no choice of the type of plants to eat
- It requires a big piece of land
- The barbed wires can tear the skin of the animals

c. Strip grazing

This when an animal grazes when it is tied on a tree/peg using a rope

Advantages

- i. Pasture is evenly used
- ii. Diseases and vectors are controlled
- iii. Labour is reduced on the farm

Disadvantages

- I. It's expensive to start and maintain
- II. It requires few animals to be kept

d. Tethering

This when an animal grazes when it is tied on a tree/peg using a rope or chain

This is the most common method used in East Africa .

Advantages of paddock grazing

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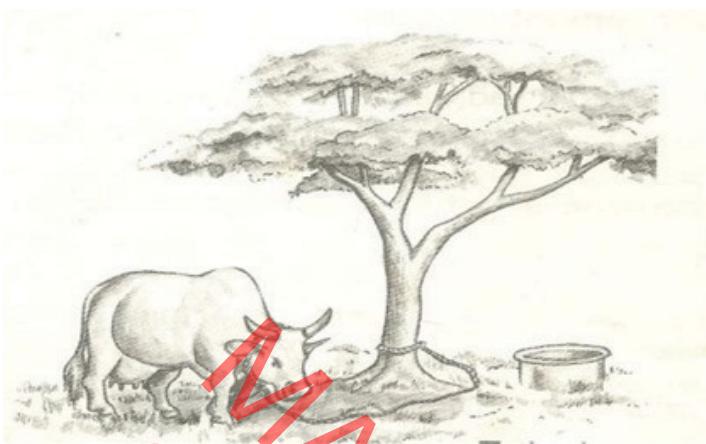
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This when an animal grazes when it is tied on a tree/peg using a rope or chain

This is the most common method used in East Africa .

A structure showing tethering method



Advantages of tethering method.

- I. It's cheap and appropriate to maintain
- II. No fencing is required
- III. Pasture chosen by the farmer is always the best

Disadvantages

- i. It can only work best for few animals
- ii. Animal feeding is only limited to areas around the peg.
- iii. It requires the farmer to keep transferring the animals when pasture reduces

Learner's activity

1. One sentence, show the meaning of the phrase rotational grazing

2. Give **two** advantages of rotational grazing

- (i) _____
- (ii) _____

3. Identify any **two** methods of rotational grazing

- (i) _____
- (ii) _____

4. Briefly explain how strip grazing can be a disadvantage to a livestock farmer

5. Give **two** advantages of paddock grazing to a farmer

- (i) _____
- (ii) _____

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LESSON 3 : HERDING AND ZERO GRAZING

Herding (free range grazing)

- ◊ This is a system where animals are left free to graze on different types of pasture as they are monitored by a herdsman.
- ◊ This system is mainly practiced by Nomadic pastoralists

Advantages

- ◆ Animals are able to do some exercises as they graze
- ◆ It does not require any fencing
- ◆ The animals graze on different pastures of their choice

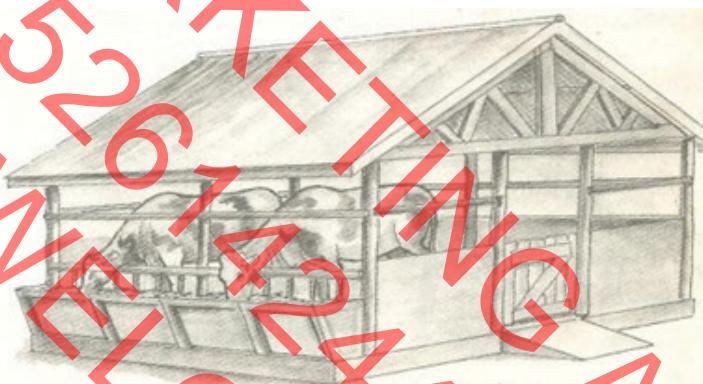
Disadvantages

- Animals need a herdsman to look after them all the time
- Animals can easily stray and destroy farmer's crops
- Inbreeding is difficult to control

Zero grazing

- ◊ This is a system where animals are kept under a special structure and water or feeds are provided.
- ◊ Small cubicles are made for resting of the animals or feeding.

An illustration of zero grazing



Advantages of zero grazing

- I. It's easy to collect manure (Farm Yard Manure)
- II. Animals are easy to control and monitor
- III. Feeds are not wasted since animals are given only what is enough.
- IV. Animals are protected from bad weather like sunshine and heavy rains

Disadvantages of zero-grazing

- I. It's very expensive to start and maintain
- II. The farmer gets over worked
- III. There is easy spread of diseases and pests
- IV. It involves of either buying feeds or growing fodder crops
- V. Much labour is required to feed and monitor the animals

Learner's activity

- ### **1. Explain the following terms;**

(i) Herding : _____

(ii) Zero grazing : _____

2. Outline any **three** advantages of herding

(i) _____

(ii)

(iii)

~~CORRECTION~~

A large, red, hand-drawn-style banner is angled across the page, tilted towards the top right. The banner is composed of several words and numbers written in a cursive, expressive font. The visible text includes "WELCOME, 2024", "ACOSMA", "15325451", "4244015325451", and "14244015325451". The banner is set against a background of white horizontal lines on a light gray grid.

HOUSING OF CATTLE AND FENCING

Like any other animals, cattle need good housing. They should be provided with shelter for the following reasons;

- i. To protect them from bad weather like heavy rain and strong sunshine.
 - ii. To protect cattle from thieves and attacks by wild animals
 - iii. To maintain their health and ease their feeding

Qualities or characteristics of a good house of cattle (byre)

- i. Well ventilated for free air circulation.
- ii. Has a strong floor made of concrete for easy cleaning.
- iii. Has a slanting to enable urine drain out.

Materials used to build cattle houses include

Wood, concrete, metals, bricks, plastics, stones etc.

A fence is a barrier of live or dead materials divided in areas of land

There are two types of fences namely;

1. Planted fences
2. Constructed fences

Planted fences

Planted (natural) fences are made by planting certain types of plants along margins of a given piece of land.

Constructed fences

Constructed (artificial) fences, are fences where people-made materials are used to create a barrier along a particular piece of land.

The materials used when constructing artificial fences include;

- * Treated poles
- * Barbed wires
- * Bricks
- * Wire nets
- * Chain links, etc.

This type of fence is the most popular one.

Importance of fencing

- i) Natural fences act as wind breaks thus controlling soil erosion
- ii) Natural fences can maintain soil fertility by adding humus to soil
- iii) Fencing controls the spread of pests and diseases to animals
- iv) It also prevents animals from destroying people's crops
- v) It allows proper use of pasture and makes culling easy

Learner's activity

1. Give **two** reasons for housing cattle

(i) _____

(ii) _____

2. What name is given to the house for cattle?

1

~~List any two qualities of a good house for cattle~~

(i) _____

(ii) _____

4. What do you understand by the term “fence”?

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5. Identify any two reasons for fencing farm animals

(i) _____

(ii) _____

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~~CORRECTION~~

Animal identification

Animal identification is basically done by numbering animals.

Numbering

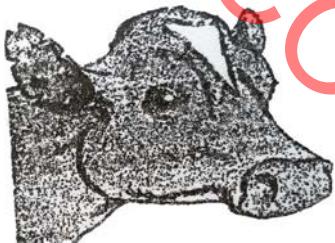
- ◊ This means putting a mark or label on the body of animals.
- ◊ Numbering enables farmers to identify animals easily.

Ways of numbering

- a. Branding
- b. Ear Notching
- c. Ear tagging
- d. Number lacing
- e. Ear tattooing
- f. Tail Bobbing
- a. Ear notching

- ◊ This is the cutting of the edge of the ears of animals with marks.

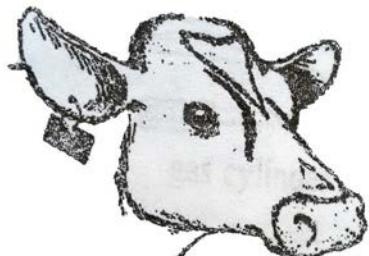
Diagram



b. Ear Tagging

This means fixing tags with numbers on the ear of animals.

Diagram



c. Numbering Lacing

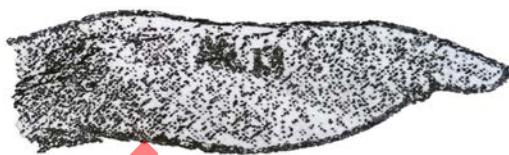
This is the putting of a wooden or iron piece of plate around the neck of animals.

Diagram

d. Ear tattooing

This means putting permanent mark on the ears of animals using pliers carrying numbers on them.

Diagram



e. Tail bobbing

This means trimming long hair on the animals' switch.

Learner's activity.

1. Briefly explain the following terms

i) Steaming up

i) Drying off

i) Calving

2. How is colostrum important to a calf.

3. Why do you think a cow should be separated from the herd before calving?

4. List down any **two** signs of a cow on heat

(i) _____

(ii) _____

CORRECTION

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OTHER PRACTICES CARRIED OUT ON CATTLE FARMS

Castration

- ◊ Castration is the removal testicles from male animals. The main aim of castration is to make the bull unable to fertilize a cow.

Reasons why farmers castrate farm animals

- i. To prevent un wanted pregnancies.
- ii. To make male animals docile for easy handling.
- iii. To prevent random mating.

Methods of castration

1. Open castration method.
2. Closed castration method
3. Use of the loop or elastrator method.

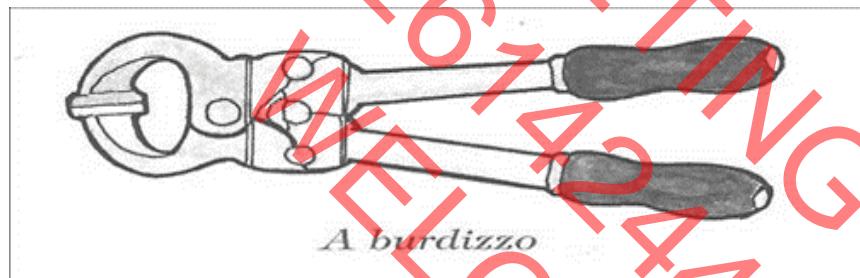
1. Open castration method

- ◊ In open castration method, a sharp instrument is used to cut, open the scrotum then the testicles are removed.

2. Closed castration method

In a *closed castration method*, an instrument called a burdizzo is used to crush the tubes leading to the scrotum.

A drawn structure showing a burdizzo



3. Use of the loop method

- ◊ In this method, a rubber ring is used to seal the sperm ducts and thus killing the epididymis

Advantages of castration:

- i. Castrated bulls grow faster and fatten
- ii. Castrated bulls are calm, humble and easy to handle
- iii. Castration helps to control venereal inbreeding (unwanted pregnancies in the herds)
- iv. Castration also helps to prevent diseases on a farm

Disadvantages of castration

- i) Animals are denied chance to enjoy natural mating.
- ii) There is loss of blood from the animal
- iii) The wounds may become septic and attract germs
- iv) It is painful to animals

Note:

The use of the ring prevents blood from flowing into the testis that will cause them to shrink and fall off.

In an open castration, the scrotum is cut open using a razorblade or a sharp knife and the testes are removed.

Learner's activity.

1. Briefly explain the term castration

—
—
—

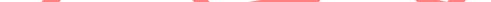
2. Give two reasons why livestock farmers castrate farm animals

(i)

(ii)

3. Cite out any two methods of castrating animals

(i)

(ii) 

4. Why do you think bulls which are not castrated usually get STDs?

CORRECTION

DEWORMING AND DEHORNING.

Dehorning:

- ◊ Dehorning is the removal of horn buds from the young animals to prevent growth of horns.
- ◊ Dehorning should be done when the calf is about 2-3 months.

Methods of dehorning

- a. By use of chemical (done between 3-14 days)
- b. By use of a hot iron (between 7-30 days)
- c. Use of spoon dehorners. (between 1-2 month)

Advantages of dehorning

- i) It makes the animal easy to handle
- ii) It increases the space in kraals, milking shades and in vehicles during transportation.
- iii) Many animals can be kept in a small space
- iv) It reduces the risk of injury among animals.

Deworming

- ◊ Deworming is the act of giving drugs to animals through the mouth to kill internal parasites

Deworming is done in two ways:

- ◊ *Drenching* is the act of giving liquid medicine to animals through the mouth. It can be by using a drenching gun.
- ◊ *Dozing*. Is the act of giving solid medicine to animals in order to kill internal parasites

Importance of deworming

Deworming kills internal parasites like tape worms etc.

Spraying

- ◊ This is the removal of ecto parasites on the body of an animal by sprinkling acaricides using a knap sack sprayer or spray race.

Deticking

This is the picking of ticks from the skin of animals using hands.

Dipping

This means making animals to swim through water mixed with acaricides in a dip tank.

Learner's activity

- ~~QUESTION~~

 1. Give a difference between drenching and dozing
 2. State a reason why livestock farmers should deworm their animals
 3. State the importance of dehorning from animals

~~CORRECTION~~

MILKING IN CATTLE

Milking.

Is the drawing milk from the cow's udder.

- ◊ Milk is got by squeezing the teats of cow
 - ◊ Milk is secreted from the mammary glands of a female animal.
 - ◊ Milk contains over 85% water and 15% proteins fats, calcium, phosphorous

Methods (Types) of milking

1. Hand milking
2. Machine milking

Note:

Hand milking: is the act of squeezing the teats of a cow using hands.

This method can be used to 1-3 animals.

Machine milking is the act of using a machine to squeeze the teats of cow.

Machine milking is the best for more than five animals.

Note:

A cow can hold up or hide milk if it's disturbed.

Disadvantages of machine milking

- i) Needs a trained person to operate machine.
- ii) The machines are expensive to buy.
- iii) The udder may be injured in case of a machine fault.

Preparation for milking

- a) Assemble the milking equipment.
- b) Put the cow in a milking place and tie the hind legs with a rope.
- c) Wash the teats, udder and your hands
- d) From each teat, draw one or two streams of milk through a strip cup to detect the presence of mastitis in milk.
- e) Start milking.
- f) After milking, wash the milking place and equipment using disinfectants.

Note:

A lactometer is used to detect the presence of added water in milk and separates fats from milk.

NB

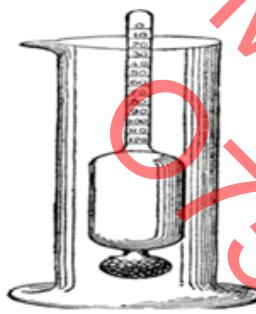
1. Before milking, all cows should be tested for mastitis and the cow discovered with mastitis should be milked last.

Diagram of a strip cup



2. The density of milk is measured using a lactometer

A drawn structure showing a lactometer



Learner's activity

1. Identify the type of milking commonly used in your locality

Start by writing the following sentence on a separate sheet of paper. Then, underline the first letter of each word.

2. State how the following equipment are useful to a livestock farmer

(i) A Strip cup : _____

(ii) A lactometer : _____

3. List down **three** ways of obtaining clean milk

(i) _____

(ii) _____

CORRECTION

PRESERVATION OF MILK AND MILK PRODUCTS

Milk products

The following are the products got from well processed milk.

Milk products	How it's made	Usage
Cheese	Made by sour milk then thickening it by salting	Put in bread or cookies
Skimmed milk	Separating fats from milk	For frying foods
Yoghurt	Turning milk after removing cream	Used to be mixed into
Ghee	Made by boiling butter	For frying foods

Milk preservation refers to keeping milk for a long time without going bad.

Methods of preserving milk are

- i. Pasteurization
- ii. Sterilization
- iii. Refrigeration

NB:

Sterilization involves killing bacteria in milk with maximum boiling followed by covering it on cooling.

Pasteurization involves strong heating and sealing milk before germs enter. This method was discovered by Louis Pasteur.

Learner's activity

1. State what you understand by the term milk preservation.

2. Give **two** ways of preserving milk.

(i) _____

(ii) _____

3. State how yoghurt is made from milk .

4. Give **two** reasons for preserving milk.

(i) _____

(ii) _____

5. State the importance of the following milk products to people

- (i) Cream : _____
- (ii) Ghee : _____
- (iii) Butter : _____

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Practices that harm cattle and other domestic animals in a home, the field, transport and abattoir:

At home:

- ⇒ Overcrowding of animals
- ⇒ Beating animals
- ⇒ Tying the legs of a cow tightly when milking
- ⇒ Poor feeding of animals

In the field

- * Beating animals
- * Making the rope too tight when tethering animals
- * Over stocking

In transit:

- ⇒ Beating animals
- ⇒ Making animals walk very long distances without food or water.
- ⇒ Tying the legs and neck of animals when transporting them.

In the abattoir:

- * Slaughtering in-calf cows
- * Starving animals before slaughtering
- * Cruel methods of slaughtering animals

LESSON 6 : CATTLE PARASITES

Parasite

A parasite is an organism that depends on another organism for food and shelter.

Cattle parasites are divided into two;

- I. External parasites (ecto-parasites)
- II. Internal parasites (endo-parasites)

a. External parasites (ecto parasites)

These are parasites that live outside the body of a host. They suck blood from the animal.

Examples include:

*Ticks *Lice *Mites *Tsetse flies Fleas etc.

Note:

Ticks suck blood from the animals and spread tick borne diseases such as;

- ◊ East coast fever
- ◊ Red water
- ◊ Heart water.
- ◊ Anaplasmosis

Tsetse flies spread germs that cause Nagana or trypanosomiasis to cattle.

b. Internal (endo) parasites

- ◊ These are parasites that live inside the body of the hosts and mainly in the intestines.
- ◊ They suck blood and feed on the digested animal's food. They are mainly worms.

Examples include;

- ◊ Tape worms feed on digested food
- ◊ Liver flukes live in the bile duct or liver.

Ways of controlling cattle parasites

- ◆ Spraying the animals using acaricides
- ◆ Practicing paddock grazing to prevent tick borne diseases
- ◆ Dipping cattle in caricides
- ◆ De-worming cattle to kill intestinal worms

Learner's activity

1. What do you understand by the term parasites?

2. Name the **two** types of parasites

(i) _____ (ii) _____

3. How do parasites gain entry into the animal's body?

4. Give **two** examples of external cattle parasites

(i) _____ (ii) _____

5. Briefly explain **two** ways of controlling parasites on a farm

(i) _____

(ii) _____

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Signs of a sick animal include;

- i) Animals appears gloomy and restless
- ii) Body temperature may be high or low
- iii) It may pass out urine with strange colours
- iv) Difficulty in breathing or even coughing
- v) Diarrhea or scouring may occur

Name of disease	How its spread and caused	Signs and symptoms	Prevention control and
<u>Bacterial diseases</u>			
Anthrax	Caused by Bacteria Spreads through body contacts and contaminated feeds	High fever Loss of appetite to graze. Sudden death Blood stained dung	Bury deeply dead animals Burn the dead animals Vaccinate animals every year Separate infected
Mastitis	Caused by bacteria Spreads through body contact with an infected animal	Milk with blood stains or pus Swollen and painful teats and udder. A cow refuses to be milked and suckled	Early treatment by treating using antibiotics Use a strip cup regularly
<u>Viral diseases</u>			
Foot and mouth disease	Spreads through sharing feeding containers Through body contacts with infected animals	Swollen teats and lameness Blisters on top of hooves and mouth (muzzle) Loss of appetite to graze High temperature Reduction in milk production	Separate sick animals Vaccinate after every 6months Application of a quarantine.
Rinderpest	Spread through body contact with an infected animal	Soars in the mouth Sunken eyes Nasal discharge Tears from eyes High temperature Diarrhea with blood stains	Separate sick animals Regular vaccination Slaughter the infected ones

Protozoan disease			
Nagana (trypanosomiasis)	Spreads through the bites of infected tsetse flies	Loss of weight Anemia Loss of appetite High fever	Spread the tsetse flies using insecticides
East coast fever	Through bites of infected ticks (brown ear tick)	Nasal discharge Diarrhea Loss of appetite High temperature	Dipping and spraying animals with acaricides to control ticks
Heart water	Through bites of infected ticks (brown ear tick)	Animals walk in circles. Animals place their heads on objects When the animal falls, legs keep paddling in air	Dipping and spraying animals with acaricides to control ticks Treat early cases with tetracycline antibiotics and sulphadi-
Red water	Spread through tick bites (red ticks)	High fever Reddish urine due to damaged liver. Animal licks soil	Vaccinate regularly. Dip and spray with the acaricides to kill

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Learner's activity

1. Give examples of viral and bacterial diseases of cattle
2. Point out any **one** cause of sickness in cattle
3. Identify the infection of cattle that attacks
 - (i) Udder : _____
 - (ii) Respiratory system of the animal : _____
4. Give **two** ways of controlling cattle diseases
 - (i) _____
 - (ii) _____

CORRECTION

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STARTING A LIVESTOCK FARM

Livestock refers to the animals kept on a farm. These may include;

Poultry Goats Sheep Pigs and Cattle

Livestock farming is the rearing of farm animals.

It's important to people in the following ways;

- i. It's a source of income when animals and their products are sold
- ii. It's a source of food
- iii. It provides employment opportunities to people

Requirements for starting a livestock farm.

For one to start alive stock farm the following requirements should be in place.

- I. Land
- II. Capital
- III. Labour
- IV. Market

a. **Land** this is a place on which the farm is started. It may be obtained in the following ways;

- ◆ By buying
- ◆ Through inheritance
- ◆ From donation

b. **Capital**, this is the money used to buy things needed to start a farm. Some of the things the money may be used for include;

- Buying land if it is to be bought
- Constructing animal houses, stores, office and stationery.
- Preparation of pasture
- Bringing water on the farm
- Paying workers and experts for the treatment and vaccination of the farm animals before the farm starts producing.
- Buying drugs, acaricides and necessary equipment for the farm.

c. **Labour**, this includes people who do activities on a farm both skilled and unskilled workers.

- ◆ Market, in livestock farming, marketing refers to the demand for cattle or their products.
- ◆ Demand for cattle products means the desire and ability to pay for the products. Therefore, it's important to know whether people are ready to buy the products from the farm.

Farm records:

These are written information about all activities carried out on farm.

Importance of keeping farm records

- i. Helps the farmer to plan and budget for the farm.
- ii. To help the farmer know whether he is making profits or losses.
- iii. To enable the farmer to make decisions

Types of farm records

- **Feeding records:** These show the amount of feeds bought, consumed and methods of feeding.

- **Breeding records:** These include reproduction, birth or death rates.
- **Production records:** These show yields of various farm produce e.g. eggs, milk, meat etc.
- **Health records:** These include when and which animals were sick, what treatment they got or which ones to cull.
- **Labour records:** These include the number of farm labourers, type of work they do and their wages.
- **Marketing records:** These include where, when and what prices various products were sold.
- **Income and expenditures:** These are records of all the sales and purchases of the farm business.

Learner's activity

1. Give a difference between livestock and livestock farming

2. Today in Uganda, many people prefer livestock farming to crop growing. Give **two** reasons for this.

(i) _____

(ii) _____

3. Identify any **two** ways of obtaining land for starting a livestock farm.

(i) _____

(ii) _____

4. List any **two** activities done by skilled and non-skilled worker on a farm.

(i) _____

(ii) _____

5. Give **two** ways in which capital can be used in starting a livestock farm

(i) _____

(ii) _____

6. Why should a cattle keeper have records on his farm?

CORRECTION

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TOPIC 3 : RESPIRATORY SYSTEM

ORGANS OF THE RESPIRATORY SYSTEM

Main product

- * Energy
- * By product – water, carbon dioxide

Raw materials for respiration

- * Food
- * Oxygen

A drawn structure showing the respiratory system



Functions of the parts

The nose:

It contains cilia that filters inhaled air

It contains mucus that helps to moisten and warm inhaled air

The wind pipe/trachea

It is a passage and air to and from the lungs

NB

The trachea is kept open all the time by cartilage rings.

The epiglottis:

Closes to prevent the food from entering into the wind pipe on swallowing.

The lungs:

- This is the organ where gaseous exchange takes place.
- It has got air alveoli that help in gaseous exchange
- The ribcage also presses the lungs during exhalation in order to let out air

Rib cage:

- Protect the lungs and heart against external harm.
- It's also covered with a pleural fluid to prevent friction between the thorax and lungs to the ribs.

Note:

Gaseous exchange takes place at the air sacs.

Learner's activity

1. State the importance of respiration to the body

2. Give a reason why it's not advisable to breathe through the mouth

3. How are cilia useful to people during breathing?

State the importance of the following organs of the respiratory system;

(i) Nose : _____

Rib cage : _____

Epiglottis : _____

4. How do plants benefit from the process of respiration?

CORRECTION

BREATHING

Breathing is the taking in and out of air.

Process of breathing

- ⇒ Breathing in (Inspiration / inhalation)
- ⇒ Breathing out (Expiration / exhalation)

Breathing in / inspiration / inhalation.

- ◊ *Inpiration* is the taking in of air by an organism.
- ◊ We breathe in to get oxygen for respiration in the body.

Events during inhalation / breathing in.

- ⇒ Diaphragm contracts and flattens.
- ⇒ Ribs move upwards and outwards.
- ⇒ Lungs expand
- ⇒ The chest increases in volume

Expiration / breathing out / exhalation

- ◊ This is the taking out of air from the body of an organism
- ◊ We breathe out to reduce carbon dioxide in the body.

Events during expiration / breathing out / exhalation

- ⇒ The diaphragm contracts and moves to its dome shape.
 - ⇒ The ribs move down wards and inwards
 - ⇒ The lungs reduce in size

Note:

Carbon dioxide dissolved in the blood plasma diffuses from the capillaries into the alveoli and exhaled out.

Abrupt coughing is caused when an external matter enters the trachea or wind pipe

Learner's activity

1. Differentiate between breathing and respiration

State what happens to the following parts during breathing in

(i) Diaphragm:

(ii) Lungs :

(iii) Intercostal muscles:

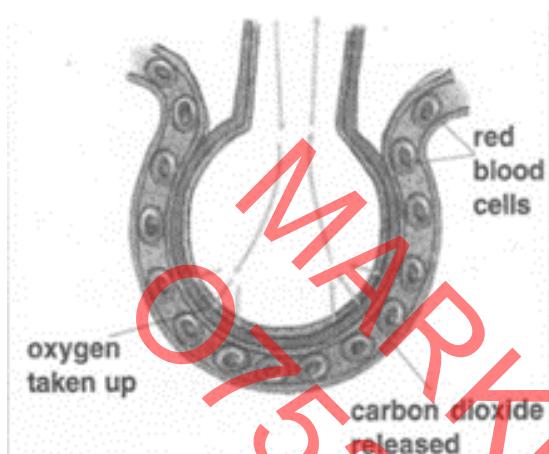
3. By what process does oxygen enter into blood?

~~CORRECTION~~

ADAPTATION OF THE ALVEOLI TO THEIR WORK

Gaseous exchange in the alveolus

An illustration showing gaseous exchange in the alveolus



How are air sacs suitable for gaseous exchange?

- They have thin walls that allow easy diffusion of gases
- They are surrounded by a network of blood capillaries.
- They are many in number to increase a surface area for gaseous exchange

Summary of the composition of inhaled and exhaled air

Gas	Inhaled air	Exhaled air
Oxygen	21%	16%
Carbon dioxide	0.03%	4%
Nitrogen	78%	78%
Water vapour	Less	More
Rare gases	0.97%	0.97%

◊ Note:

- ◊ As we breathe out, more carbon dioxide is expelled because some carbon dioxide is produced by body cells during respiration
- ◊ Nitrogen is left unchanged because it is not necessary in the body.
- ◊ We breathe out less oxygen because most of it is used by the body during respiration

Learner's activity.

- State **two** ways in which alveoli are adapted for exchange of gases.

(i) _____

(ii) _____

2. Study the table below and answer the questions that follows;

Component	Inhaled air	Exhaled air
Oxygen	21%	16%
Nitrogen	78%	78%
Carbon dioxide	0.03%	4%

a). Briefly explain why;

(i) Exhaled air contains little oxygen

(ii) Concentration of nitrogen remained unchanged

(iii) Exhaled air contains more carbon dioxide

CORRECTION

DISEASES OF THE RESPIRATORY SYSTEM.

Respiratory diseases are diseases that affect people's respiratory organs i.e. the lungs, trachea, nostrils, and bronchioles.

- ◊ Some respiratory diseases are communicable diseases spread through contaminated air while others are non-communicable caused by smoking.
- ◊ Some respiratory diseases are hereditary spread from parents to the babies.

Diseases of the respiratory system.

Diseases	Signs and symptoms	Prevention / control
Lung cancer (caused by smoking)	Chest pain High fever	Avoid smoking tobacco Seek medical treatment
Influenza (flu) (caused by virus)	Difficulty in breathing Constant coughing and sneezing	Drink a lot of fluids
Pneumonia caused by either bacteria or virus	Difficulty in breathing Coughing	Wear warm clothes during cold weather. Treat using antibiotics.
Bronchitis (caused by bacteria)	Difficulty in breathing	Treat with antibiotics
Tuberculosis. (caused by bacteria)	Loss of weight Mild fever weight Night sweats Chest pain	Isolate the infected ones Immunise using children BCGVaccine Avoid drinking unboiled
Whooping cough (caused by bacteria)	Blocked nose Coughing spasm Difficulty in breathing Runny nose	Drink fluids rich in vitamins Immunise children with DPT vaccine. Avoid overcrowded and poorly ventilated houses/places.
Asthma (allergies)	Difficulty in breathing Body weakness during cold weather. Mucus flow	Go for medical attention Keep away from sources of allergies e.g. cold pollen grains.
Diphtheria (caused by bacteria)	Sore throat Convulsion swollen neck	Immunise the infants using DPT vaccine Go for medical treatment

Disorders of the respiratory system

- ◆ Choking
- ◆ Hiccups
- ◆ Sneezing etc

Habits that improve the working of the respiratory system

- ◆ Avoid smoking
- ◆ By having regular physical exercises.
- ◆ Feeding on a balanced diet.
- ◆ Keep away from dusty places etc.
- ◆ Stay in well ventilated houses/places

Learner's activity.

1. Identify any **two** diseases of the respiratory tract

(i) _____ (ii) _____

2. Describe any **two** ways of keeping the respiratory system in a healthy working condition.

(i) _____
(ii) _____

3. Draw the structure of the respiratory system and name the parts;

- i. Trachea
- ii. Left bronchus
- iii. Diaphragm
- iv. Lung

4. Write SARS in full

CORRECTION

MARKETING ACOSMA
0752614244/0753254517
WELCOME, 2024

Uses of fossils

- Fossils help geologists to determine the age of a place or rock.
 - Fossils help geologists to know how different plants and animals have existed and changed.
 - Fossils help to tell how land looked before.
 - Fossils show us how and where the different sedimentary rocks were formed.
 - Fossils help to tell what the animal or plant looked like, what it ate, where it lived etc.

Learner's activity

1. Write any **one** way in which each of the following can be used as a resource;

(a) Water :

(b) Sun : <img alt="A horizontal line with red numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 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1097, 1097, 1098, 1099, 1099, 1100, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1197, 1198, 1199, 1199, 1200, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1239, 1240, 1241, 1242, 1243, 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1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1697, 1698, 1699, 1699, 1700, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1797, 1798, 1799, 1799, 1800, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1897, 1898, 1899, 1899, 1900, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1997, 1998, 1999, 1999, 2000, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048,

(c) Soil : _____

(d) Air : E Z G

2. How can rocks be useful to people? (Give one way)

3. Briefly explain the term fossils

CORRECTION

Water : Water is a renewable resource when used carefully.

How water is used as a resource?

- ◆ Water is used for cooking, washing etc
- ◆ Water is used as a coolant in fractions
- ◆ Running water is used to generate hydro electricity

Sun : The sun as a resource

How the sun is used as a resource

- We get light from the sun that enable us to see
- Our skins make vitamin D using light from the sun
- Heat from the sun is used to sundry harvested crop produce
- Plants are a source of building materials e.g. poles, timber

How are plants used as resources?

- ⇒ Some plants are a source of food to people.
- ⇒ Some plants give us natural plant fibres like cotton, sisal, jute and linen.
- ⇒ Some plants are a source of herbal medicine to cure certain diseases.

How are animals used as resources?

- ◆ Some animals like merino sheep provide wool, used to make cloths, suits, blankets, carpets, curtains, bed sheets etc.
- ◆ Silk worms provide silk used to make different types of cloths.
- ◆ Some domestic animals provide skins and hides used to make bags, shoes, belts, etc
- ◆ Cattle provide horns and hooves used to make glue.
- ◆ Bees help to pollinate farmers' crops, provide honey and bee wax.
- ◆ Some animals like oxen and donkeys provide labour.

Air and Wind

- Both are renewable resources
- Air is a mixture of gases
- Wind is moving air.

How wind is useful

- ♦ Wind turns wind mills to produce electricity
- ♦ Wind drives wind mills to draw water from the underground and millgains
- ♦ Wind helps in winnowing

ALLOYS

An alloy is a mixture of two or more metals

Alloy	Combination	Uses
Brass	Copper and Zinc	Decorating ornaments Making wires, tubing cases for bullets.
Dentist Amalgam	Gold and Copper, gold,	Making coins.
Solder	Lead and Tin	Joining metals

Why are alloys made?

- ♦ To make the metal harder
- ♦ To lower the melting point of the metal.
- ♦ To make the metal more resistant to corrosion i.e. wear and tear
- ♦ To increase the electrical resistivity of metals.

Learner's activity

1. Briefly explain the term alloy

2. Give **two** examples of alloys

(i) _____ (ii) _____

3. State then importance of the following alloys;

(i) Brass : _____

(ii) Manganese steel : _____

(iii) Cupronickel : _____

4. Point out any **two** uses of alloys in our society

- (i) _____
- (ii) _____

CORRECTION

075261424410153254517
WELCOME, 2024
ACOSMA
MARKETING

Living things as resources

Plants as resources

- Some animals are eaten as food
- Plants provide wood used for building houses and making furniture.
- Some plants are sources of herbal medicine.
- Some plants are sources of fibre.

Animals as resources:

- ◆ Some plants are eaten as food.
- ◆ Some animals are used for transport.
- ◆ Some animals provide hides and skins used to make leather products.
- ◆ Their hooves are used to make glue and buttons.

Types of resources

1. Renewable resources
2. Non-renewable resources

Renewable resources:

Renewable resources are resources that can be naturally replaced.

Renewable resources include;

- (i) Water (ii) Plant (iii) Animals (iv) Air (v) Soil

Characteristics of renewable resources

They can naturally be replaced

Importance of plants as resources.

- ◆ They can get exhausted
- ◆ They take millions of years to be formed
- ◆ They exist in limited quantities
- ◆ Rocks
- ◆ Minerals
- ◆ Fossil fuels (Petroleum, coal and natural gas)

Non-renewable resources.

Non-renewable resources are resources that cannot be replaced naturally when used up.

Characteristics of non renewable resources:

- These resources cannot be replaced when they get used up.
- These resources can be exhausted in case they are not properly handled and preserved.

Examples include;

- (i) Rocks (iii) Clay (v) Sand
(ii) Petroleum (iv) Minerals

Resources from nonliving things

A nonliving thing is one without life.

- (i) Soil (iii) Air and wind
(ii) Water (iv) Rocks and minerals

Learner's activity

1. Differentiate between renewable and nonrenewable resources

2. Give **two** examples of renewable resources in your environment

3. Write **one** sentence to explain why copper is regarded as a nonrenewable resource.

4. Stat **one** way in which the following can be used as a resource.

- (i) Water : _____

(ii) Soil : _____

~~CORRECTION~~

Conserving renewable resources

Conserving renewable resources

- ◊ Wild life refers to animals and plants in our environment.
- ◊ Many kinds of animals have disappeared from earth and they are extinct.
- ◊ Other animals are about to disappear and we say they are endangered.
- ◊ Animals may become endangered or extinct because they are killed for their skins, horns, tusks.
- ◊ Some plants have also become endangered or extinct due to the increasing demand for wood and local medicine.

Conserving non renewable resources

- ◊ Soil erosion should be controlled.
- ◊ Soil should be kept fertile by using manure and fertilizers.
- ◊ Plastic wastes like broken Jerrycans, polythene papers should be recycled.
- ◊ Vehicles in dangerous mechanical conditions should be repaired to conserve fuel.
- ◊ Petroleum products should be used wisely to prevent further exploitation of oil

Learner's activity

1. What do you understand by the term conservation of resources?

2. Give **two** ways of conserving the following resources in our environment

(i) Wild life

(i) _____

(ii) _____

(ii) Soil

(i) _____

(ii) _____

(iii) Minerals

(i) _____

(ii) _____

3. Briefly explain the term fibre

4. Give **two** examples of plant fibres

(i) _____ (ii) _____

CORRECTION

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WELCOME, 2024 MARKETING

CORRECTION

MARKETING ACOSMA
0752614244/0753254517
WELCOME, 2024

SCIENCE WORK BOOK FOR PRIMARY SIX TERM III-2019

SCIENCE AT HOME AND COMMUNITY

DATE: _____

Spelling Exercise

WORD

CORRECTIONS

- | | |
|----------|-------|
| 1. _____ | _____ |
| 2. _____ | _____ |
| 3. _____ | _____ |
| 4. _____ | _____ |
| 5. _____ | _____ |

WATER

Water is a colourless liquid substance made up of hydrogen and oxygen gases. These gases are in the ratio of 2:1 (H_2O)

Sources of water

- Rain water
- Artesian wells
- Hot springs
- Streams, lakes, rivers, swamps, ponds, oceans, and seas.

Properties of pure water

- It is colourless
- It is without suspended matter like germs.
- It has no smell
- Pure water is tasteless
- Pure water boils at $100^{\circ}C$ ($212^{\circ}F$) and freezes at $0^{\circ}C$ ($32^{\circ}F$) at sea level.
- Pure water forms lather (foam) very easily with soap.

Uses of water to the body

- Water makes up part of blood as plasma
- Helps to dissolve the digested food for easy absorption in the body.
- Maintains the shape of body cells.
- Cools the body in form of sweat when it evaporates.
- Helps in formation of body fluids such as tears, saliva, urine, sweat etc.

Other uses of water

- For domestic use e.g. cooking, washing etc
- For drinking by man, mammals, and birds
- For irrigation in agriculture
- Used in industries for cooling, washing machines and raw materials.
- Used to generate hydro-electricity
- Used by plants for photosynthesis

Preparation of safe water for drinking

i. Boiling

When water is heated, it boils, to a temperature of 100°C (212°F) this temperature kills germs.

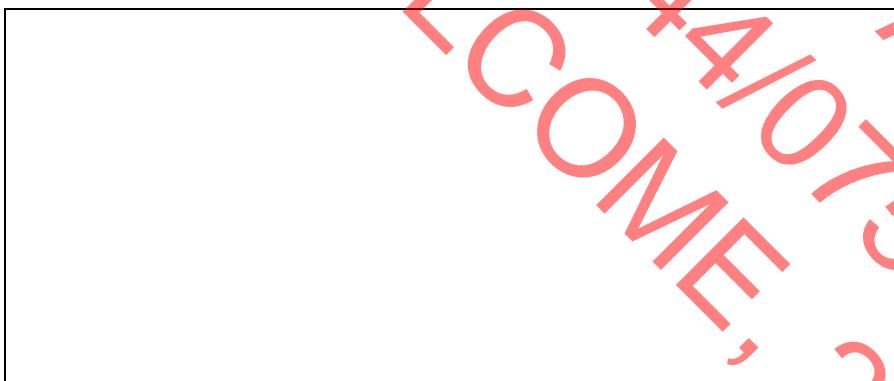
ii. Filtering

This is the process by which a clean or sterilized piece of cloth or local water filter.

Examples of solid impurities filtered are dirt, soil, stones, leaves, animals wastes etc.

NB: Filtered water is not safe for drinking because it may be containing some germs.

Diagram showing filtration method.



iii. Treatment Of Water

Treatment of water is when chemicals are added to kill germs in it.

Examples of chemicals used to treat water are; chlorine, water guard and aquasafe.

Advantages of Chemicals Used in Water Treatment

The chemicals kill germs in water

Disadvantages of Using Chemicals

- They are expensive
- They do not make water clear
- They add some smell and taste to water.

ACTIVITY

1. Mention the main natural source of water in the environment.

2. What is safe water?

3. Write down any two methods of making dirty water clean.

i _____

ii _____

4. Give one reason why water obtained by filtration is not good for drinking.

5. Give any two disadvantages of using chemicals to treat water.

i _____

ii _____

6. Mention two chemicals used for making water safe for drinking.

i _____

ii _____

7. How does the boiling of water make it safe for drinking?

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DECANTING

Decanting is a method of removing large particles of objects from water.

Decanting is done by pouring water slowly from one container to another so that heavy particles are left behind.

In this method, the three pot system is used to purify the water.

Diagram showing Decantation method.



WATER IMPURITIES

Impurities are contaminants or foreign objects in water. Water impurities make it unsafe for use. Impurities may be soluble or insoluble organic.

Inorganic impurities

It consists of dissolved mineral salts which make water unsafe to use.

Organic impurities

These include bacteria , fungi and protozoa others may be dead plant materials such as leaves and grass.

Examples of water impurities

- Human wastes
- Animal wastes like urine , dung
- Herbicides
- Insecticides
- Silt from erosion

CLEANING CLOTHES AT HOME

One main use of water at home is to wash clothes. This also called laundry

Step used in cleaning clothes at home

Sorting

- It involves selecting and putting clothes together according to colour , intensity of dirt, nature of the fabric , use of etc.

Soaking

It is the putting of clothes in soapy water for some time.

Importance of soaking clothes

- It helps to loosen dirt and dissolve stains
- It saves time during washing as it needs little effort to remove it.
- It guards against tear and wear due to constant rubbing while washings.

Washing

It is the removal of dirt using water and detergent

Rinsing

Clothes are put in clean water. It helps to remove all soapy water from the clothes.

Wrapping

It involves squeezing water out of the clothes

NOTE : Woolen clothes should be dried without wringing because it may loosen the fabric and makes them to lose their shape.

Drying

Some clothes can be dried out completely under the sun.

Ironing

It helps to remove creases from the washed clothes and bring them to their original form

ACTIVITY

1. How can water be contaminated?

2. Write down any four steps involved in washing clothes.

i

ii

iii

iv

3. Give one reason for soaking clothes.

4. How far should a water source be away from a pit latrine?

5. Why is water obtained by distillation not recommended for drinking?

6. What scientific name is given to a clear liquid obtained by filtration?
7. Write down one danger of drinking contaminated water.

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ACCIDENTS AND FIRST AID

What is an accident?

An accident is a sudden happening that cause harm to the body.

Accidents can take place anywhere.

They may happen at home, school, place of work, where we go for prayers, on the pitch etc.

First aid

This is the first help given to causality before he/she is taken to hospital.

A casualty is a person involved in an accident and needs first aid

Burns

These are body injuries caused by heat.

Types of burns

1. Burns
2. Scalds

Burns and scalds

Burns are injuries caused by dry heat.

Causes of burns

- a. Hot metals
- b. Hot flat iron
- c. Acids
- d. Glowing charcoal
- e. Hot charcoal stove
- f. Fire

Degree of burns

Burns and scalds are described using the word degree to tell how severe they are;

There are three types of degrees of burns. These are;

- a) First degree burns
- b) Second degree burns
- c) Third degree burns

First degree burns

These are minor burns which do not form blisters.

A blister is a raised skin with a liquid underneath.

The skin is tender for several days

The skin is unbroken.

First aid

Put the burnt area in cool water immediately after the accident.

Why?

To reduce the temperature of the burnt part.

N.B; First degree burns need no dressing.

Second degree burns

These are burns which form blisters.

They are severe than first degree burns.

Signs of second degree burns

- a) Blister are formed
- b) Unbroken blisters

FIRST AID FOR A SECOND DEGREE BURN

If the blister is broken, wash the area with clean water and soap.

Cover the skin with a bandage or clean cloth.

NB: It is not good to break the blister because it may lead to infection of the wound by germs. Fats, oil, coffee, herbs or dung should never be put on the burn because they can cause infection.

Sugar should not be put on the burn because it attracts houseflies which bring germs to the wound.

The victim of the second degree burns should be given plenty of fluids to drink.

Third degree burns

There are burns which cause deep burning of the skin.

The skin is burnt deeply and it appears shiny white.

ACTIVITY

1. What is an accident?

-
2. Why do accident victims need help?
-

3. Write short notes about each of the following.

a) Fracture; _____

b) Dislocation _____

c) Sprains _____

d) Strains _____

4. Write the following abbreviations in full as used in first aid administration.

- i) 3Bs _____
- ii) ABC _____
5. Who is a first aider?
6. State the difference between a first aid box and a first aid kit.

7. State the importance of each of the following in first aid administration.
- a) Stretcher _____
- b) Safety pin _____
- c) Arm sling _____

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FIRST AID FOR A THIRD DEGREE BURN

Put the burnt areas in clean cold water.

Encourage the casualty to drink a lot of fluids.

NB: Patients of second and third degree burns should be given a lot of fluids to drink.

Why?

They lose a lot of fluids through the burnt skin by evaporation

Prevention of burns and scalds

- Use heat insulators to handle hot objects.
- Cooking from raised places
- Keep petroleum products out of reach of children.
- Do not allow young children to cook.
- Refill lanterns or lamps after putting them off.
- Teach children the dangers of burns
- Tell children to play away from fire places.

Fever and convulsions

Fever is the condition of the body when its temperature goes beyond the normal.

The normal body temperature is 37°C or 98.4°F.

Fever is not an illness but a symptom of many illnesses such as malaria, typhoid, measles, etc

Effect of fever

It can lead to convulsions

Convulsions

These are uncontrollable jerky movements of the body.

Convulsions can be stopped if the disease causing them is treated.

First aid for convulsions

- Remove all tight clothes from the body of the victim.
- Put an object in the mouth of the victim to stop him from biting the tongue.
- Give the victim plenty of cold drinks after recovery.
- Take the patient to hospital

First aid for fever

Carry out tepid sponging (cold compress).

A wet cloth is put on the forehead or chest of a victim.

Caution

Do not use very cold water because it leads to convulsions.

ACTIVITY

1. What term describes how severe a burn is?

2. How is a burn different from a scald?

3. How is the cause of a burn similar to that of a scald?

4. In which type of burn are blisters formed?

5. Identify the first aid for a burn.

6. How are insulators important in the control of burns and scalds?

7. Why are people with a third degree burn encouraged to take plenty of drinks?

8. Why is it dangerous to break blisters in case of a burn?

9. Give two reasons why burnt parts should be put in cold water.

i)

1)

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FAINTING

It is the loss of consciousness for a short time

Main cause of fainting

Reduced supply of blood rich in oxygen and food to the brain.

Conditions that can lead to fainting

- Anxiety
- Heavy body exercises
- Extreme sorrow (sad news)
fear
- Prolonged hunger

FIRST AID FOR FAINTING

- Put the victim in open air.
- Remove tight clothings around the neck and chest to enable the victim get enough oxygen.
- Raise the legs of the victim higher than the head.

Why?

To allow blood flow faster to the brain.

Don't allow the victim to be over crowded

DROWNING

This means dying as a result of having lungs filled water.

Drowning has no first aid since the victim dies.

Near drowning

It is temporary loss of breath due to having one's lungs filled with water.

A person who has nearly drowned has only four minutes to live therefore a first aider must be very fast to save his life.

First Aid for near drowning.

Remove the victim quickly from water

Shout for help

Lie the person on his back.

Carry out mouth to mouth breathing (kiss of life)

How to carry out mouth to mouth respiration

- Make the victim to lie on his back
- Tilt the head backwards and keep his mouth opened
- Remove any object stuck in the mouth
- Press the victim's nostrils with your fingers to close them
- Put your mouth directly into the mouth so that the chest rises.
- Stop a bit to let the air out and blow again
- Repeat this many times (about 15 times in a minute)
- Continue the steps until the victim can breathe again by himself.
- Place the heels of your hands between the navel and the ribs of the victim
- Make a quick strong push forward into the ribcage.

How to prevent near drowning

- Acquire swimming skills
- Always empty bath tubs
- Covering all septic tanks
- Putting on a life jacket when traveling on water.
- Fencing pits that builders used to trap water
- Do not allow children to go near water sources without adults
- Do not allow babies to play in basins full of water.

Common drowning places

- Swimming pool
- Ponds
- Streams
- Lakes
- Wells
- Seas and oceans
- Bath tubs

ACTIVITY

1. What is fainting?

2. State the main cause of fainting.

3. Suggest any two conditions that can lead to fainting.
i) _____
ii) _____
4. What first aid can you give to a person who has fainted?

5. Why should the legs of a person who has fainted be held higher than the head?

6. State the difference between drowning and near drowning

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7. Name any one place for drowning.

- #### 8. How are lifejackets important when swimming?

CORRECTIONS

Are lifejackets important when swimming?

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CORRECTIONS

NOSE BLEEDING

This is the flow of blood from the nose.

Causes

- Over inhalation of dry air
- Over blowing or one's nose with cold
- Taking foods one's body is allergic to.
- Taking medications for a long time (aspirin, garlic, ginger)
- Over inhalation of dry air dries the blood vessels in the nostrils and they break.
- Over blowing the nose over strains the blood vessels in the nostrils and they break.
- Taking aspirin, garlic, and ginger prevents normal blood clotting and instead thin the blood.

First Aid

- Let the causality sit and bend forward.
- Squeeze the upper side of the nostrils.
- Encourage the causality to breathe through the mouth to prevent over straining the blood vessels.
- Keep the head of the victim higher than the level of the heart.
- Put the ice wrapped in a towel on the nose and chick

Why?

To make the lining of blood vessels in the nostrils moist.

NB: do not make the causality to lean back because it allows blood to flow back to the throat which may cause vomiting or irritation.

Prevention

- Keeping the nostrils moist
- Taking citrus fruits such as oranges and lemons to strengthen the lining of blood vessels.
- Taking foods one is not allergic to.

Foreign bodies

A foreign body is any unwanted matter that enters the body.

A foreign body may enter the body through the;

- Nose
- Mouth
- Anus
- Eye
- Ears
- Vagina

Examples of foreign bodies

Insects

Small stones

Seeds (coffee, berries, beans, g.nuts)

Dirty or dust

Soil

Foreign body in the eye

Objects that enter in the eye include; dust, small insects, soil.

First Aid

Wash the eye with plenty of clean water.

Use the corner of a soft piece of cloth to remove the foreign body.

Take the victim to the oculist.

Foreign body in the ear

Examples

Small insects

Small seeds

Small stones

First Aid for foreign body in the ear.

- Make the victim sit and bend the head to one side.
- If it is an insect, pour clean water in the ear for the insect to float and come out.
- Flash light at the entrance of the ear if the foreign body is an insect.
- Take the victim to the hospital

Foreign body in the nose

Foreign bodies in the nose include;

- Small insects
- Small seeds
- Small stones

First Aid for foreign body in the nose.

Tell the victim to blow his nose hard and fast.

Take the casualty to the health worker.

ACTIVITY

1. What is nose bleeding?
2. Write down any one cause of nose bleeding.

3. In four sentences, explain first aid for nose bleeding.

- i) _____
- ii) _____
- iii) _____
- iv) _____

4. What are foreign bodies?

5. Write down any two examples of foreign bodies.

6. What first aid can you give to a P.2 child with a seed in the ear?

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Foreign body in the throat

Foreign body in the throat are mainly large pieces of food or small bone.

Foreign body in the throat lead to choking and death.

First aid

- Give the victim a number of sharp blows in the back
- Wrap your arms around his waist and press the belly upwards strongly.
- If the victim is unconscious, lie him on his back and make several sudden pushes on the belly using heels of your hands.
- If the person does not breathe, try mouth to mouth breathing.
- Take the victim to hospital
- If the victim is smaller than you, turn him over your folded leg and give sharp blows at the back.

Preventing accidents caused by foreign bodies

- Chew food properly
- Do not talk or laugh when eating
- Keep beads, button, coins, and seeds out of reach of children
- Putting on glasses while moving on motorcycles and bicycles
- Teach children not to put seeds, coins, stones, and soil in their eyes, nose, ears, and mouth.

Poisoning

Poison is any substance once taken into the body damages body organs or causes death.

Ways poison can be introduced into the body

- Through food
- Through air
- Through animal bites (snakes, rapid dogs)
- Through injections
- Through swallowing (orally)

Common house hold poisons

Paraffin	herbicides	Acaricides
Root poison	Jik	
Petrol	Insecticides	Drug (Aspirin/chloriquine)
Wormcides	Diesel	

Signs of poisoning

- Rapid breathing
- Fever and sweating
- Feeling thirsty
- Mental confusion
- Comma
- Vomiting
- Loss of balance

First Aid

Give the Casualty a lot of fluids (fresh milk).

Why?

To dilute poison in the stomach

Make the person vomit in case its non-corrosive poison.

How to make the person to vomit

- Placing the finger in the mouth or throat.
- Give the victim water mixed with soap
- Rush the victim to the hospital

NB: If the causality has taken paraffin, petrol, or bleach (Jik), do not make him vomit.

Why?

It causes more damage to the stomach and gullet.

Preventing poisoning

- Keep petrol, paraffin out of reach of children
- Keep drugs out of reach of children
- Follow the doctor's prescription
- Buy drugs from recommended pharmacies
- Dispose expired drugs.
- Avoid drugs misuse

The ABC technique followed before giving first AID

- A- Air way
- B- Breathing
- C- Circulation

TOPICAL QUESTIONS

1. Mention the main reason for giving first aid

2. Distinguish burns and scald.

3. How is the cause of burns similar to that of scalds?

4. Why should a burnt hand of a victim be dipped in cool running water?

5. Why is it not advisable to break blisters on the skin?

6. How do heat insulators prevent burns and scalds?

7. Define fever.

8. List down the main effect of fever.

9. Explain the first aid you can give a person who has fever.

10. How would you help a person who has convulsion?

11. What is fainting?

12. State the main cause of fainting?

13. How does drowning differ from near drowning?

14. Why should patients of second and third degree burns be given a lot of drinks?

15. Give one difference between first degree burns and third degree burns.

16. Why is it not good to make the victim who is nose bleeding to face up.

17. How does a foreign body in the throat cause choking?

18. Why would you give plenty of drinks to a person who has taken poison?

19. Why is it dangerous to make a person who has drunk paraffin to vomit?

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SANITATION

Definition:

Sanitation is the general cleanliness of a place where we live.

Ways of maintaining sanitation

- Construction of latrines or toilets for proper disposal of wastes.
- Digging rubbish pits and providing dust bins for proper disposal of house hold refuse.
- Slashing bushes around the homes.
- Draining away all stagnant water to deny mosquitoes breeding and protecting water sources.

Constructing a latrine or toilet

A latrine is pit dug in the ground where human excreta is deposited.

Uses of latrines

They keep faeces and urine where vectors cannot bring them to our food.

Types of latrines

- i) Pit latrine
- ii) Toilets
- iii) Potties

Pit Latrines

Qualities of a well built latrine

- It should be 5 to 7 metres deep
- The floor should be strong enough to stand on and smooth to sweep and clean.
- It should have a hole big enough to allow faeces and urine to pass and small enough to prevent children from falling inside.
- It should have spiral walls and doors to provide privacy to the user.
- It should have a lid to cover the hole.

NB: Covering controls bad smell and the movement of flies is controlled.

- It should be constructed 10 metres away from the main house and 30 metres from the water source.
- It should be built below the water table or source to avoid contamination.

Site of a pit latrine

- It should be at least 10 metres from a living house to prevent flies from carrying germs on to food.
 - It should be at least 30 metres away from a water source (water table) to prevent faeces and urine seeping in to water source and contaminate it.
 - It sinking rainy seasons
 - Should not be built above the water table to prevent the faeces and urine going into and contaminate.

ACTIVITY

1. What is sanitation?

 2. State the importance of keeping proper sanitation.

 3. Why are we advised to wash hands after visiting a latrine?

 4. Write down any two items used to keep proper sanitation.
i) _____
ii) _____
 5. Why should a pit latrine be constructed thirty metres away

 6. How are latrines and toilets important in our communities?

 7. State one danger of not having a toilet or latrine

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TYPES OF PIT LATRINE

- i) Ordinary pit latrine
- ii) VIP latrines

Ordinary pit latrine

It is common in villages.

It should have a lid to cover the hole.

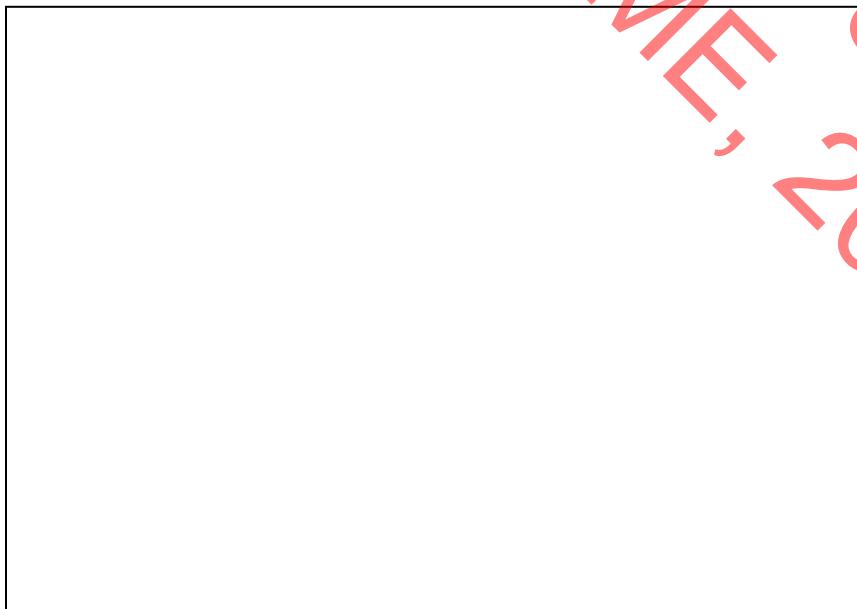
The VIP latrine

It is a special type of a latrine with a vent pipe to take out smell and a screen on top to trap flies.

Important features of a VIP latrine

- Vent pipe: it lets out bad smell.
- Screen on top: traps flies until they die.
- Spiral shaped walls- no doors for free circulation of air.
- It has no lid to let in air/ to allow free air circulation in the pit

Structure of a VIP latrine



How to construct a VIP latrine

- It should be at least 10 metres away from any school, house, kitchen, and other buildings
- It should be 30 metres away from any water source.
- It should be built on solid ground and not in valleys or swamps.
- Dig a pit of about 5-10 metres deep

Cover the pit in any of the following ways;

- i. Use strong poles of hard timber.
- ii. Metal bars
- iii. Build a house on top of the pit
fix a net or screen on top of the vent pipe.
Place the pipe in its hole.

How to maintain a VIP latrine

- The floor should be swept or washed if it's cemented.
- Wash or remove any faeces, insects, cobwebs and dust from walls and corners of the roof
- Trim grass and bushes around the latrine
- While using a latrine, make sure that the faeces go directly into the hole.
- Clean with any soft tissue or leaves
- Wash your hands with soap after using the latrine.

ACTIVITY

1. Give one reason why a VIP latrine is referred to as;
i) Ventilated_____
ii) Improved _____
2. Write VIP in full.

3. Why is it not advisable to cover the hoe of a VIP latrine?

4. Of what importance are the following features to a VIP latrine?
a) Vent pipe _____
b) Screen _____
5. How far should a VIP latrine be constructed from;
i) water source? _____
ii) Kitchen _____
6. Point out two diseases that can break out due to poor sanitation.
i) _____
ii) _____
7. How does a VIP latrine reduce house flies in the environment?

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TOILETS (WATER CLOSET SYSTEM)

This is a bowl shaped device used for disposing human waste, which is flushed away the bowl by water from a tank (cistern).

Components of a flush toilet system

Parts include;

- i. A tank that stores water for flushing
- ii. A seat with a cover for sitting.
- iii. A pipe that takes water from the tank to the bowl and another that takes it to septic tank.
- iv. A septic tank, an underground storage hole for human waste and waste water from kitchen and bathroom (i.e.Sewage)

The waste materials in the septic tanks are called sewage.

Sewage from septic tanks may be carried away by pipes (sewers) for treatment to make it less harmful.

Where there is no pipe system, it is carried using vehicles called cesspool emptiers.

In Uganda, collection and treatment of sewage from homes and institutions is done by National water and sewage corporation (NSWSC).

- v. The lever is either pulled or pushed top release water during flushing.

Flush toilets are commonly used in cities, towns and other places where there is piped water.

Advantages

- Can be put inside the house and vehicles
- They are easy to clean
- They are user friendly, even young children can use them.

Disadvantages

- They are very expensive
- They require a lot of water to function
- They are only used where there is piped water.
- They can easily get blocked if hard objects are put in it.

How to maintain flush toilets

- Keep the seat clean, do not step or urinate in them.
- Flush toilets after use.
- Use only soft tissue or toilet paper after cleaning yourself.
- Do not use the toilet when it is blocked.

ACTIVITY

1. Write Ecosan in full.
2. Suggest any three problems faced by urban toilet systems.
i) _____
ii) _____
iii) _____
3. How is a VIP latrine different from a conventional pit latrine?
4. Suggest one reason for smoking ordinary pit latrines.
5. Point out one way of controlling faecal diseases.
6. Write down one two ways of maintaining water borne toilets.
i) _____
ii) _____
7. Write NWSC in full.
8. Give any one detergent used when cleaning toilets.

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THE REPRODUCTIVE SYSTEM

Growth is an increase in size e.g. changes from larva to adult.

Development refers to growing gradually and becoming more mature.

Reproduction

This is the process by which all living things multiply and increase in number (become many) i.e. give rise to new off-springs (young ones) to continue a generation of the species.

Types of reproduction

There are two types of reproduction

- i) Asexual reproduction
- ii) Sexual reproduction

Asexual reproduction

This is the type of reproduction where no reproductive cells (gametes) are used to produce young ones.

Examples of asexual reproduction

Vegetation propagation in plants e.g. budding, grafting, layering, marcotting, stem cutting, suckers, bulbs crown, slips, leaves, and root cutting, cell division, binary fission in single celled animals e.g. Amoeba, bacteria, paramecium.

Sexual reproduction

This is the type of reproduction which involves joining (fusing) of two reproductive cells, male and female gametes.

The union /fission of a male female gametes is called fertilization.

The nuclei of the two cells unite and form a Zygote develops into a new individual or foetus.

In animals, the male reproductive cells (gametes) are called sperms and are produced by the reproductive organs called testes.

The female reproductive cells are called Ova and are produced by the ovaries.

Hermaphrodites

These are animals that contain (have) both male and female reproductive organs (Testes and Ovaries) on themselves. E.g. earth worms and snails.

Types of fertilization

There are two types of fertilization

- i) External fertilization
- ii) Internal fertilization

External fertilization

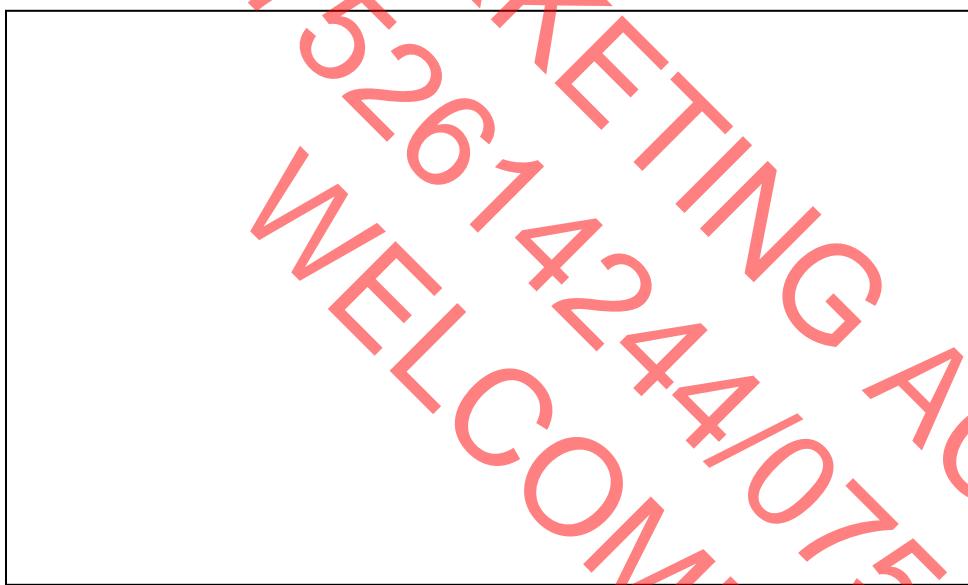
This is where the female lays eggs and the male pours sperms on them outside the mother's body to fertilize them e.g. fish and amphibians.

Internal fertilization

This is when eggs are fertilized inside the mother's body after mating.

Human sexual reproduction

Diagram showing the cross section of the female reproductive organs (system)



The female reproductive organs and their functions

The Ovary: there are two ovaries. One on the left and another on the right. Ovaries produce ova (ovum) the female reproductive cells.

They also produce oestrogen and progesterone hormones (female hormones)

Oviduct (fallopian tube): it is the tube down the uterus (womb) from the ovary. It is the passage for an ovum to the uterus. This is where fertilization takes place.

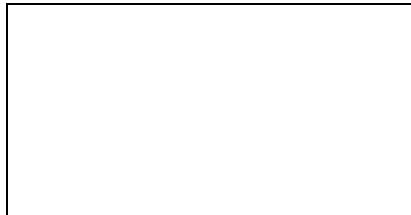
Uterus (womb): it is a bag like structure inside which the foetus or Zygote grows from.

It is also where implantation takes place.

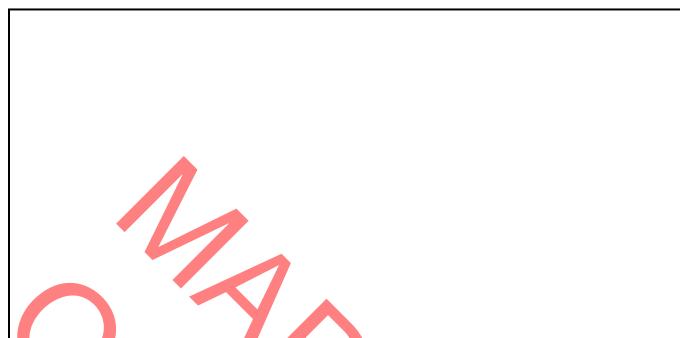
Cervix: This is a ring of muscle which helps to close the lower end of the uterus to the vagina thereby protecting it /foetus from external damage.

The structure of gametes

- i) Female gamete (an Ovum)



ii) Male gamete (sperm)



ACTIVITY

1. What is reproduction?
2. Point out the two types of reproduction.
 - i) _____
 - ii) _____
3. Identify any two gametes involved in reproduction.
 - i) _____
 - ii) _____
4. Suggest the role played by each of the following in the reproductive process.
 - a) Ovaries _____
 - b) Testes _____
 - c) Oviduct _____
 - d) Uterus _____
5. Write down any two forms of asexual reproduction.
 - i) _____
 - ii) _____
6. Write short notes about each of the following.
 - a) Puberty _____
 - b) Adolescence _____
 - c) Ovulation _____
 - d) Implantation _____

CORRECTIONS

DATE: _____

Spelling Exercise

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CORRECTIONS

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The structure of male reproductive organ



Functions of parts of the male reproductive organ

Scrotum: it is a sac or bag that encloses and protects the testes.

It also regulates temperature around the testes.

Seminal vesicle glands: these are glands that produce the male seminal fluids containing sperms; they lie outside the abdominal cavity to make them have lower temperature than the normal body temperature for maximum production of sperm;

Testes; They produce sperms (male reproductive cells)

They also produce testosterone hormone which is responsible for secondary sexual characteristics and also increases desire for sex.

They start producing sperm cells during adolescence from age 11-16years

Epididymis: it is a long coiled tube which stores and then carries sperms.

Sperm duct: It is an extension of the epididymis and delivers the sperms to the urethra where they pass and go out.

Prostate gland: produce a fluid (seminal fluid) which helps to neutralize (make harmless/ the acid in urine in the urethra. It also kills germs which are in sperms.

Seminal vesicles: it stores excess sperms.

Erectile tissue (penis): it is a spongy tissue which when filled with blood it erects (stands) to ejaculate sperms.

Ovulation

This is when mature ova are released from the ovary.

An ovary releases an ovum every month i.e. the release of ova is done alternately.

ACTIVITY

1. Where does fertilization take place in the female reproductive system?

2. Explain the term fertilization.

3. Besides producing ova, give one other function of the ovaries in the female reproductive system.

4. How is the function of the testes similar to that of the anthers of the flower?

5. Give the function for each of the following parts.
a) Scrotum; _____
b) Testes; _____
c) Epididymis; _____
6. State the difference between asexual reproduction and sexual reproduction.

7. In the space provided below, draw a sperm cell.


DATE: _____

Spelling Exercise

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CORRECTIONS

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MENSTRUATION

This is the periodic release of blood from the uterus as a result of rapture of the uterus walls when fertilization has not taken place.

This helps to wash and clean the uterus in preparation to receive a foetus.

NB:

The first menstruation called menarche starts in girls between the age of 9-15 years.

The last menstruation period end at around 45 years and is called menopause

Normal menstruation takes 3-4 days.

It takes place after every 28 days if all conditions are normal.

It may be interrupted by conception, strong fever, or any abnormalities in the body.

The menstrual cycle



Care during menstruation

- To prevent infection and avoid germs, diseases, one must be clean.
- Use sanitary materials such as tampax, tampons, always, cotton wool.
- Visit health workers incase abnormalities are noted.

Fertilization

- Fertilization takes place in the oviduct /fallopian tube.
- Immediately after fertilization, the zygote moves to the uterus.
- The zygote attaches itself on to the placenta with the help of an umbilical cord, this process is called implantation.
- The placenta supplies the embryo with food nutrients and oxygen at the same time it removes waste products.
- The umbilical cord transports food to the foetus and waste products from the foetus to the placenta to be carried away by blood.
- The period of pregnancy from conception to birth is called gestation period and lasts for 9 months in humans.
- Development of the foetus takes place in the uterus.
- The amniotic fluid act as shock absorber and protect the foetus.
- The amnion/ amniotic membrane protects the body and had the fluids.

The stages of development are;

Fertilization - Zygote - Foetus - baby

Diagram showing development of the foetus in uterus

Sex determination

Sex of a child is determined by chromosomes found on the gametes/ sex cells, there are X and Y chromosomes
XX chromosomes are for girls and XY for boys. Sperms carry XX and XY chromosomes

Signs of pregnancy (good and Bad)

- Morning sickness
- Vomiting and nausea
- Swollen legs
- General body weakness
- Swollen belly
- Frequent urination
- Faster breathing

Requirements of an expectant mother (pregnant mother)

- Good diet (balanced diet) for proper growth of the baby.
- Should avoid taking drugs like tobacco and alcohol.
- Should visit antenatal clinic for medical check up and advice.
- Should take vaccine against tetanus (Tetanus Toxoid)
- Enough rest and sleep.
- Wear maternity dresses to have comfort
- Perform light physical exercises

ACTIVITY

1. What is menstruation?

2. Name the part in the female reproductive system where implantation takes place.

3. Explain the term implantation.

4. Suggest any two signs of pregnancy.
i) _____
ii) _____
5. List any two requirements of a pregnant mother.
i) _____
ii) _____
6. Why should pregnant mothers go for ante-natal health care services?

7. Write TT in full.

8. How important is menstruation to girls and women?

CORRECTIONS

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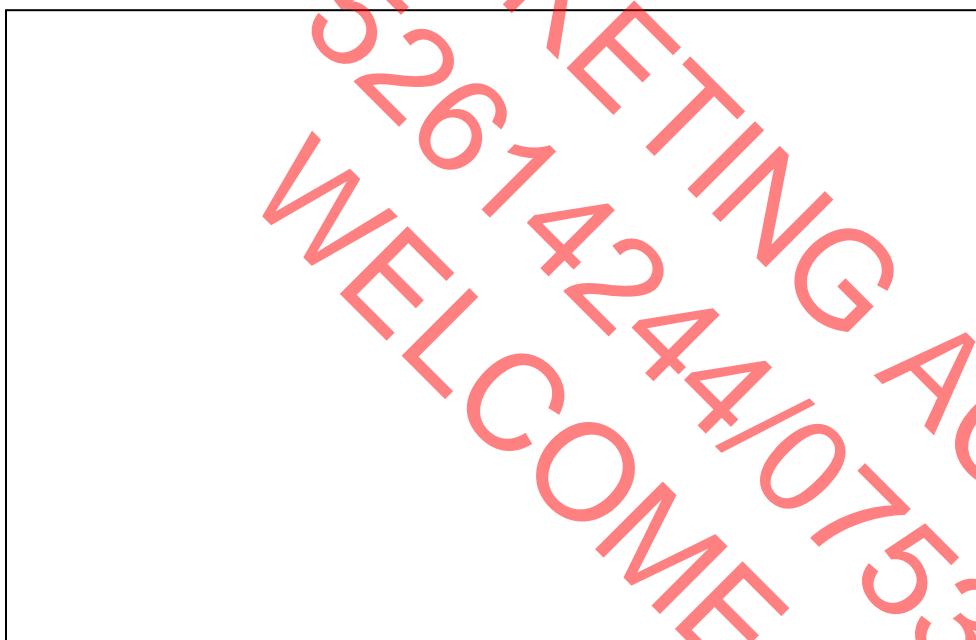
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Human foetus in the uterus.



Functions of some parts.

1. Umbilical cord;

- i) It transports food and oxygenated blood from the placenta to the embryo through the artery.
- ii) It transports waste products and deoxygenated blood from the embryo to the placenta through a vein.

Note: The umbilical contains an artery and a vein.

2. Placenta.

- i) It stores food and oxygen before it is taken to the embryo or foetus.
- ii) It prevents blood of the mother from mixing with blood of the embryo.
- iii) It attaches the foetus to the uterus
- iv) It stores wastes from the embryo until they diffuse into the mother's blood.

3. Amniotic cavity.

It protects the foetus from harm.

4. Amnion.

It is a sac for keeping amniotic fluid.

BIRTH AND LABOUR

After nine months of pregnancy, the mother will go into labour and produce a child.

This is called giving birth or parturition (child birth).

Labour refers to the effort of child birth shown by contractions of the uterus.

What makes a baby after birth cry?

It is due to sudden change in temperature (environment change). Crying helps to start the normal functioning of the lungs i.e. breathing starts at birth.

NB: incase a baby fails to cry/breathe artificial breathing should be done immediately.

Single child birth: this is when one child is normally born to mother.

Multiple birth: this is when two or more babies are born at the same time.

Twin: when two babies are born at the same time by the mother.

Twins

Identical twins

This is when one fertilized ovum divides normally and grows into two separate babies.

Identical twins are usually same sex

All their physical aspects are the same.

Siamese twins

These are twins whose body remained joined /fused at one point.

Fraternal twins

This is when two ova are released and fertilized and then develop into twins fraternal twins are not always the same sex.

Multiple birth

If there are three or more ova released and fertilized it results into multiple birth.

Examples of multiple births

Triplets: Three children are born

Quadruplets: Four children are born.

Birth Control Contraception

This is a method of avoiding getting many children you can not care for properly i.e. having the number of children you want and when you want them.

Family planning

This is the use of birth control methods to get the number of children you want and when to have them in family.

Child spacing

This is the provision of enough time between the birth of the different children in family.

Functions of family planning association

- It educates people about child spacing
- Educates people about quality of life when children are few
- Provides people with family planning contraceptives.

Reasons why people have many children

- Ignorance of family planning methods.
- High infant mortality rare
- Traditional practices and values (customs)
- Prestige or fame and security.

Problems of having many children

If a family has too many children, there will be;

- Inadequate financial resources.
- Lack of enough food for the children
- Poor education for children
- Lack of proper medical care
- High infant mortality rare
- Mothers sickness as a result of having too many children e.g. miscarriage, maternal anemia, fatigue, low birth etc.

How to avoid infant mortality rate (death)

- Immunization against infant killer diseases.
- Participating in health care services e.g. health education
- Practice family planning.

Advantages of family planning

- Immunization against infant killer diseases
- It reduces risk of serious disease and maternal death.
- It reduces cases of abortion/m miscarriages
- It improves the health and well being of the family.
- Controls population growth.
-

ACTIVITY

1. What do we call the act of giving birth in goats?

2. How long is the gestation period of a woman?

3. Explain the term gestation period.

4. Write NFPAU in full.

5. How important is family planning to a country like Uganda?

6. Write down two types of twins.

i) _____

ii) _____

7. Explain why a baby cries during birth.

8. What determine the sex of the child?

9. What is family planning?

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METHODS OF BIRTH CONTROL

There are two methods used for birth control namely;

- i) Natural Methods
- ii) Artificial methods

Natural methods

- Abstaining from sex
- Withdrawal/pulling out before releasing sperms during sex
- Bed separation by couples
- Prolonged breast feeding
- The mucus method (testing Jell)
- Using calendar or moon beads.

Artificial methods

- Use of condoms
- Use of contraceptive pills
- Birth control injections e.g. injecta plan,
- Intra uterine devices e.g. coils, spirals, diaphragm.
- Use of jellies and foams
- Sterilization by vasectomy in men and tube ligation
- Using norplant

MYTHS AND MISCONCEPTION ABOUT ADOLESCENCE AND REPRODUCTION HEALTH

- A myth is a traditional belief that is not true
- Misconceptions are false ideas or beliefs

Myths and misconceptions	Truth
Family planning contraceptive make women permanently barren	When a woman feels she should become pregnant , she just stops using the contraceptives and become pregnant again
Family planning increases teenage pregnancy	Instead teenagers are protected against unwanted pregnancies and STDs / STIs
Use of contraceptive causes high blood pressure and	Once the women use the right drugs as advised by the

kills women during birth	trained worker. Complications are reduced
Use of contraceptive leads to producing babies with abnormalities such as having one eye , ear being blind or lame	This is not true
Family planning is against the teaching of the church	Atleast the church supports the natural family planning method.
Contraceptives make women to loose hair on the head and grow beards	There is no scientific proof about this

Changes during adolescence and puberty

Adolescence

Adolescence is a period of development changes between child hood and adult hood.

A person at this stage is called an adolescent.

Puberty

This is the period of physical mental and sexual maturity i.e. when becomes a young adult capable of producing.

Changes in adolescents at puberty are called sex characteristics

There are three types namely;

- i) Primary sex characteristics
- ii) Secondary sex characteristics
- iii) Emotional /psychological sex characteristics
- iv) Out of step adolescent changes.

Primary sex education (Basic)

This involves the development of sexual organs for reproduction.

Primary sex characteristics in boys

Penis and testicles enlarge (increase in size)

The testicles start producing sperms (boys begin experiencing wet dreams).

Internal organs begin producing fluid like semen.

Primary sex characteristics in girls

Thickening of uterus walls

Menstruation begins

Ovaries develop and start releasing eggs (ovulation starts)

Secondary sex characteristics (physical)

These involve the physical development of the body parts.

Secondary sex characteristics in boys

- Voice breaks and deepens
- Hair grows on different parts of the body e.g. penis, armpits, chest, around the mouth and anus.
- Bones and muscles enlarge i.e. a boy becomes muscular.
- Sweat glands become more active.

Secondary sex characteristics in girls

- Breasts enlarge and looks tender and attractive
 - Sweat glands become active making the face look smooth
 - The hip (pelvis) enlarges and a girl puts on a lot of weight.
 -

ACTIVITY

1. Identify the two methods of birth control.

i) _____

ii) _____

- ## 2. What is child spacing?

卷之三

3. Name one permanent birth control method in males.

- W* *Y* *Z*

~~Write IUDs in full as used in family planning.~~

6. Write IUDS in full as used in family planning.

~~How does the use of condoms prevent unwanted pregnancies in women?~~

- Winfred 1 1 1 1 1 1 1 1 1 1 1

i)

- ii) _____

1)

ii) _____

~~CORRECTIONS~~

Emotional and psychological changes.

These are changes that occur in the mind of an adolescent.

They cannot be seen and may not be realized by the adolescent. They occur the same way in both boys and girls.

They include;

- i) The adolescent becomes interested in the members of the opposite sex.
- ii) They react quickly to different situations ie a girl or boy who was docile, humble, cooperative becomes resistant and disobedient.
- iii) They want freedom.
- iv) They easily become angry and disappointed.
- v) They reject the rules of their parents and teachers.
- vi) They want to be seen and recognized as mature.
- vii) They move in groups with boys and girls of their age called peer groups.

Out of step adolescent changes.

These are changes which occur differently to different individuals in the same age group.

They may occur earlier or later than expected.

- i) A boy who was previously short may suddenly grow taller than the age mates
- ii) A girl who was small may find herself fatter than her age mates.
- iii) Anxiety may be produced in those who mature late and left behind by their age mates.
- iv) Those that mature late may be influenced by those who mature early.

Problems caused by adolescence stage.

- i) It brings conflicts between adolescents and their parents.
- ii) It brings conflicts between adolescents' culture and religion
- iii) It creates sexual conflicts amongst adolescents
- iv) It creates forms of wishes, desires, anxiety and fantasies caused by sexual maturation.

DATE: _____

Spelling Exercise

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- 1. _____
- 2. _____
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CORRECTIONS

SEXUALLY TRANSMITTED DISEASES (STDS)

These are diseases spread through having un protected sexual intercourse with an infected person.

They are also called venereal diseases (VDS) or Sexually Transmitted Infections (STIS)

Examples of common STDS are;

- a) HIV/AIDS caused by a virus
- b) Gonorrhoea caused by bacteria
- c) Syphilis caused by bacteria
- d) Chancroid caused by bacteria
- e) Trichomoniasis caused by protozoa
- f) Candidiasis caused by fungi
- g) Genital herpes caused by a virus
- h) Genital warts caused by a virus
- i) Pelvic Inflammatory Diseases (PIDS)

HIV/AIDS

The term AIDS stands for; Acquired Immune Deficiency Syndrome.

Acquired means got from outside the body

Immune means protected against or safe from disease, the body is always protected by white blood cells.

Deficiency means lack or shortage or AIDS virus destroys white blood cells and the immune system becomes weak.

Syndromes mean a collection or group of diseases and signs which show the presence of a disease.

AIDS is a pattern of disease symptoms which attack and destroy white blood cells leaving the body unprotected against infections.

Causes of AIDS

AIDS is caused by avirus called HIV (Human Immunodeficiency Virus) commonly called AIDS virus.

Transmission of AIDS virus

- AIDS virus can only survive in the human body.
- The disease can be spread when body fluids of an infected person get into contact with that of the healthy person.
- Body fluids can be exchanged in the following ways;
- Sexual contacts with an infected person.
- Blood transfusion from an infected person.
- Sharing or using sharp cutting instruments
- From an infected pregnant mother to her newly born baby at birth.
- From the mother to the baby through breast feeding.

AIDS virus can not spread by;

- Normal shaking of hands
- Bites from mosquitoes and bed bugs
- Caring for AIDS patients
- Sharing cutlery and cooking utensils
- Hugging or embracing AIDS patients
- Cleaning, washing beddings and clothing of people with HIV/AIDS

Signs and symptoms of HIV/AIDS

Signs

- The major signs of AIDS are;
- Herpes zoster locally called “Kisipi” which inflames the skin making it appear as scalded.
- Chronic diarrhoea which may last for more than a week
- Sudden loss of about 10% of the normal body weight.
- Skin cancer which is also called Kaposi's sarcoma, it causes itching and leads to scratching that leaves black spots.
- Swollen lymph glands especially those of the neck and armpits
- Oral thrush where by the tongue, gums, lips, and inside of the mouth plus the alimentary canal
- Chronic cough which lasts long.

Symptoms

- Tiredness without any proper cause
- General body weakness
- Persistent fever which is on and off
- Loss of appetite

People who are at risk of getting HIV/AIDS

- Sexually active people between the ages of 15-45 years
- Rape and defilement victims
- Long distance truck drivers and traders who often have casual sex when away from their married partners for a long time.
- Prostitutes who sell themselves for sex to many partners.
- Bar attendants.

Effects of AIDS/HIV

- These are many effects of HIV/AIDS on infected person, family and community.
- They suffer personal pain from the disease.
- The family spends a lot of money on treatment, care and feeding.
- They are stigmatized or isolated in the society.
- Loss of family income if the bread winner dies.
- Many children are orphaned and become child parents.

Prevention and control of HIV/AIDS

- There is currently no cure against AIDS, so people need to guard themselves against the disease by;
- ABC approach
- Having one faithful sexual partner
- Abstain from sexual intercourse until marriage
- Avoid practices which involve risks of getting AIDS like tattooing, ear piercing.
- Use of condoms during sex.
- Screening blood before marriage and transfusion
- Sterilizing medical instruments.
- Disposing syringes and needles after use.

How can we manage AIDS patients

- People with AIDS need support in many ways..
- Eating a balanced diet.
- Join good social groups to relax and avoid heavy work.
- Should give up bad habits like smoking and drinking alcohol

Diseases that can be mistaken for AIDS.

- a) cancer
- b) Tuberculosis
- c) Typhoid
- d) Malnutrition
- e) Effect of Alcoholism
- f) Measles

1. Write following abbreviations in full.

a) AIDS. _____

b) HIV. _____

c) VCT. _____

d) ACP. _____

2. What are Sexually Transmitted Diseases?

3. How is the cause of gonorrhoea similar to that of syphilis?

4. Write down two ways through which HIV/AIDS is spread.

i) _____

ii) _____

5. Apart from HIV/AIDS, mention one other STD caused by a virus.

6. Write down two signs of gonorrhea in each of the following groups of people.

a) Babies

i) _____

ii) _____

b) Women

i) _____

ii) _____

c) Men

i) _____

ii) _____

DATE: _____

Spelling Exercise

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3. _____	_____
4. _____	_____
5. _____	_____

DISORDERS OF THE REPRODUCTIVE SYSTEM

- Impotence is the inability of a man's penis to become stiff or erect
- Low sperm count
- Is the inability of the testes to produce enough sperms
- Penile cancer
- This is the growth of abnormal cells that form on the penis

Enlargement of the prostate glands

This disorder is common in elderly men over 50 years of age

Fibroids

These are swellings called cysts that develop on the wall of the uterus.

Ectopic pregnancy

This is a condition when a fertilized egg implants itself in the oviduct

Ovarian tumours

These are masses of abnormal cells that form on the ovary

Cervical cancer (cancer of the cervix)

This is the condition in which the cervix develop tumours

It is caused by the Human Papilloma Virus (HPV).

Inflammation of the oviduct.

- Counseling, is a special form of communication through which a person is helped to control his/her feelings by a counselor

Types of counseling

- Pre-HIV antibody test counseling
- Post-HIV antibody test counseling
- Counseling HIV/AIDS patients

Importance of counseling

- It prevents AIDS victims from committing suicide
- Avoids spread of the disease to others knowingly.
- To encourage people to continue to live longer and useful.

Organization in Uganda that offers counseling services

In Uganda, there are many governmental organizations which offer counseling.

TASO: The AIDS Support Organization. It also provide food supplements food for patients.

AIC: AIDS Information Centre

ACP: AIDS Control Programme of ministry of health. It also provides HIV/AIDS testing.

Gonorrhea

- It is a venereal disease caused by a bacterium called gonococci (gonococcus)
- It is spread through unprotected sexual intercourse with an infected person.

Signs in men

- Pain when urinating
- Discharge of pus from the penis
- Painful swelling on the testicles
- Rash and sores on the genital areas

Signs in women

- Slight pain when urinating
- Sometimes very painful monthly periods.
- Vaginal discharge of smelly pus
- Pain in the lower abdomen.

Signs in babies

- Red and swollen eyes
- Pus comes out of the baby eyes
- Blindness.

Effects of gonorrhea

- It leads to permanent damage of male and female reproductive organs.
- Leads to sterility in both men and women.
- Cause blindness in babies.
- Blocks the urethra making urination difficult and painful.

Control and prevention of gonorrhea

- Using the ABC formula for preventing AIDS and other STDs.
- A-Abstain from sexual intercourse
- B- Be faithful to your partner
- Condoms should be used during sexual intercourse
- Seek early medical treatment
- Stop playing sex until you are completely treated.

Syphilis

Syphilis is a chronic and dangerous venereal disease caused by a bacterium called Treponema Pallidum. It is spread by having sexual contact with the infected person.

Signs and symptoms vary with stages

- Painful sores called chancre appears 2-5 weeks after infection.
- In second stage a number of signs and symptoms such as sores in mouth, throat, itching skin, rashes appear.
- In the third stage the bacteria cause heart disease, paralysis, blindness and insanity or madness.

Prevention and control of syphilis

It is prevented by practicing ABC approach

Infected people should see a doctor immediately

Other urinary tract infection

- Pelvic inflammatory diseases (PIDs)
- Infected people should see a doctor immediately
- It affects the abdominal and pelvic area.

Epididymis

Serious infection of the epididymis leading to swelling tenderness and pain in the testicles.

Genital herpes

These are sores (inflammation) of the genitals caused by virus called herpes simplex.

Trichomoniasis Vaginalis

It is caused by protozoa called trichomonas

The disease causes inflammation of the vagina

Genital warts

These are sores in the sexual parts and around the anus.

They are caused by a virus.

Hydrocell

It is an increase in quantity of fluids in the sac around the testis and epididymis.

Orchitis

Inflammation of the testis due to injury or infection of tuberculosis

Candidasis

It is also called thrush and is caused by a fungus

Sterility

In ability of a man to impregnate a women or a woman failing to conceive

Lymph glandoma

This refers to enlarge lymph nodes spread by sexual contact.

Urethriris

A disease that cause the urethra to become sore and swollen.

Prevention

- Using ABC approach
- Seeking medical attention
- Personal hygiene especially of the genitals.

PIASCY MESSAGES ABOUT ADOLESCENCE AND REPRODUCTIVE HEALTH

PIASCY STANDS

P – Presidential

I – Initiative on

A – AIDS

S – Strategy for

C – Communication to the

Y – Youth

The following messages are passed to us through PIASCY activities

- Abstaining from sex until marriage
- Learn how HIV is transmitted
- HIV damages the immune system
- People living with HIV and AIDS need care and support
- Testing for HIV
- Managing menstruation
- You need to understand how your body changes at puberty
- Sexually transmitted infections make it easier for HIV infections
- Say No to sex for gifts
- Life skills helps to protect you from HIV.
- Using violence to get sex is wrong
- You have the right to say No to forced marriages.
- Say No to bad touches
- Choose to delay sex
- Avoid risky places and risky behaviors

TOPICAL REVISION

1. Which component of blood is destroyed by HIV virus?

2. State the importance of the fallopian tube in the female reproductive system.

3. What is ectopic pregnancy?

4. Write down any two primary sexual characteristic in adolescent boys.

i)

ii)

5. What is fertilization?

6. State the importance of each of the following parts of the reproductive system.

- a) Placenta; _____
- b) Testes; _____
- c) Uterus; _____
- d) Urethra; _____

7. State any two requirements of a pregnant mother.

- i) _____
- ii) _____

8. Write short notes about the following.

- a) Puberty _____
- b) Ovulation _____
- c) Implantation _____
- d) Adolescence _____
- e) Menstruation _____

9. Explain the term family planning.

10. Write PIASCY in full.

11. Mention any two diseases that affect the reproductive system.

- i) _____
- ii) _____

12. What is child spacing?

13. Explain why pregnant mothers need ante-natal care service.

14. How does prolonged breast feeding delay the next pregnancy?

15. Write down one permanent method of birth control in women.

CORRECTIONS

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