

P.6 SCIENCE LESSON NOTES FOR TERM II

THEME: WORLD OF LIVING THINGS.

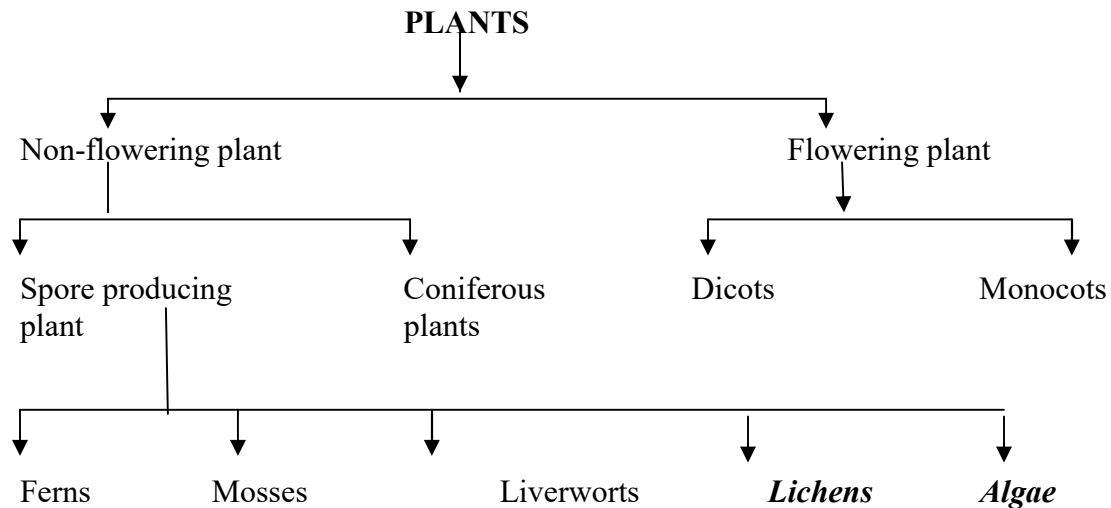
TOPIC: FLOWERING AND NO-FLOWERING PLANTS.

CLASSIFICATION OF PLANTS

DATE	CLASS	NO. OF PUPILS	DURATION
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1. THE PLANT KINGDOM

Classes of plants



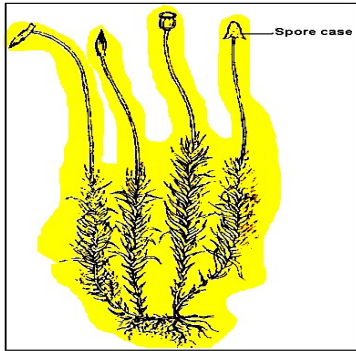
NON-FLOWERING PLANTS.

1. Plants are grouped into flowering and non-flowering plants.
2. Non-flowering plants are plants that do not develop flowers.
3. Groups of non-flowering plants include mosses, algae, ferns, lichens, liverworts and conifers.

MOSESSES:

1. Mosses are tiny green plants that commonly grow on bricks, walls, barks of trees, where enough moisture can enable them to grow.
2. Mosses grow in a tuft (group) because they use their interwoven roots to keep water for future use.
3. Mosses reproduce by spores.
4. The spores of mosses are produced and stored in a capsule (spore case).

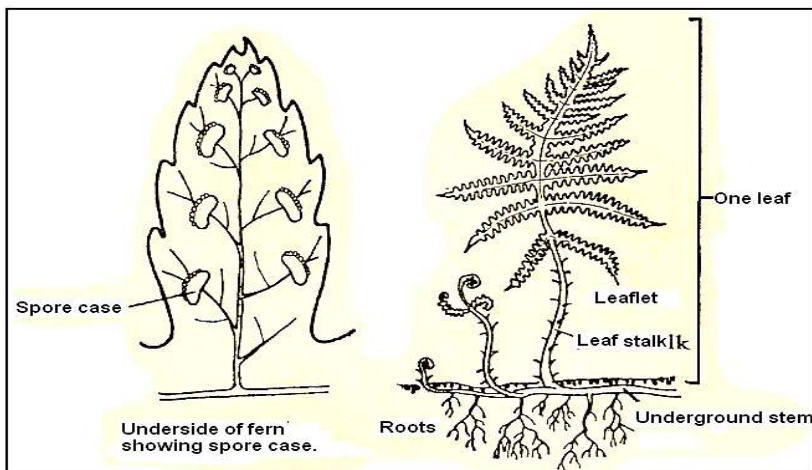
A MOSS PLANT:



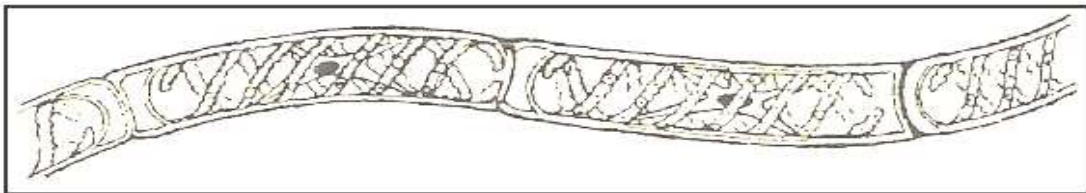
FERNS:

1. Ferns have underground stems with adventitious roots.
2. Ferns reproduce by spores that grow in special spore cases on the back of the leaves.
3. Ferns are used for decoration in some communities.

A FERN:



ALGAE:



1. Algae grow in a water environment.
2. Algae do not have proper leaves, stems or roots.
3. Algae breathe oxygen dissolved in water.
4. Algae include the spirogyra, sea- weeds, etc...
5. Sea- weeds reproduce by spores.
6. A spirogyra reproduces by cell division (fragmentation).
7. Water animals feed on some types of algae.

8. Algae make our water containers dirty.
9. Algae block drainage channels and water pipes.

LICHENS:

1. Lichens commonly grow on rocks, barks of trees, walls, etc...
2. Lichens are formed from a symbiotic relationship between a fungus and alga.
3. Lichens reproduce by spores.
4. **LIVERWORTS:**
5. Liverworts grow in water and commonly appear as floating leaves.
6. Liverworts reproduce through spores.

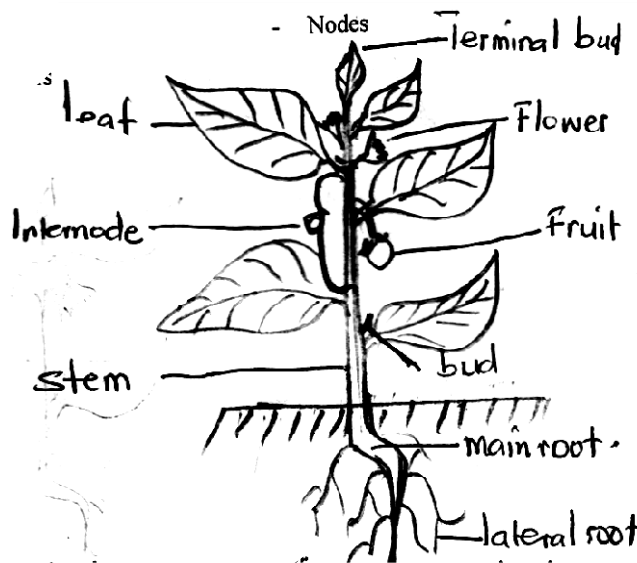
CONIFERS:

1. Conifers have proper roots, up right stems and small needlelike leaves.
2. The needlelike leaves help conifers in reducing the rate of transpiration in dry conditions.
3. Conifers reproduce by special seeds found in cones. Cones do not develop from flowers.
4. Conifers include pines, Cyprus, cedar, etc....
5. Conifers provide people with softwood for making soft boards and wood pulp. Wood pulp is used to make paper.
6. Conifers are used for firewood.
7. Conifers are used for building materials.

FLOWERING PLANTS (PRACTICAL)

1. **What are flowering plants?** These are plants that *bear flowers and reproduce by means of seeds.*
2. **Name the two systems of a flowering plant.**
 - The root system
 - The shoot system
3. **Identify the parts of a root system.**
 - Main root / tap root
 - The fibrous root
 - Root hairs
 - Lateral roots
4. **Identify the parts of the shoot system.**
 - Stem
 - Leaves
 - Axillary bud
 - Terminal bud
 - Fruits
 - Flowers
 - Internodes
 - Nodes

5. Draw and indicate the parts of a flowering plant.
Parts of a flowering plant



Terminal bud - grows into new leaves *and makes a plant grow taller.*

Lateral bud – grows into a branch or flower.

Activity

1. What is a flowering plant?
2. Name two systems of a flowering plant.
3. Identify the parts that make up
 - a. Shoot system
 - b. Root system
4. *Why is a bean plant called a flowering plant?*

THE ROOT SYSTEM (PRACTICAL)

- This is the part of a plant which grows in the soil.
 - A true root system develops from the radicle of plants.
 - Roots of a plant which grow from part of a plant other than radicle are called adventitious roots.
1. State the functions of roots to plants.
 - Roots hold the plants firmly into the soil.
 - Roots absorb water and mineral salts from the soil.
 - In some plants roots store food for the plants.
 - Roots act as tubes to take water and mineral salts to the stem.
 2. Name the two types of roots.
 - Primary roots
 - Secondary roots
 3. Name the two examples of primary roots.
 - Tap roots

- Fibrous roots

NB (i) Primary roots are roots that grow from the radicle.

(ii) Secondary roots are roots that grow from any other parts of a plant like stem or leaves.

4. **Mention the two types of root system.**

- Tap root system
- Fibrous root system

NOTE: The secondary roots are termed as adventitious roots.

Activity

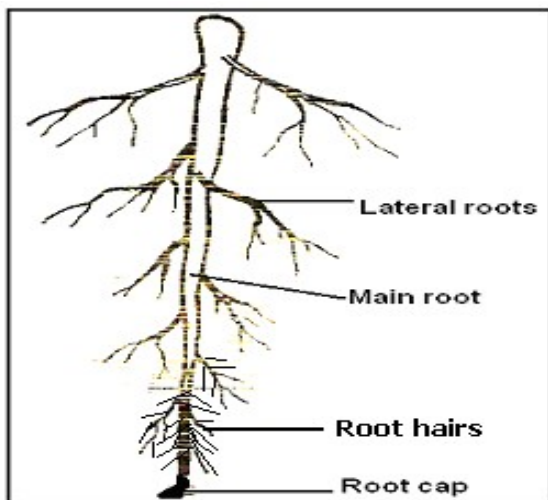
1. What is a root system?
2. State any four functions of roots to plants.
3. Name the two types of primary roots.
4. Give four examples of secondary roots.
 1. **What are tap roots?** These are roots formed when the radicle forms a large root with small lateral branches.

NOTE: Tap roots system is common with only dicotyledonous plants.

2. **Name any two examples of plants with tap roots.**

- Beans
- Soya beans
- G.nuts
- Jack fruits
- Muvule

3. **Draw a diagram showing tap root system.**



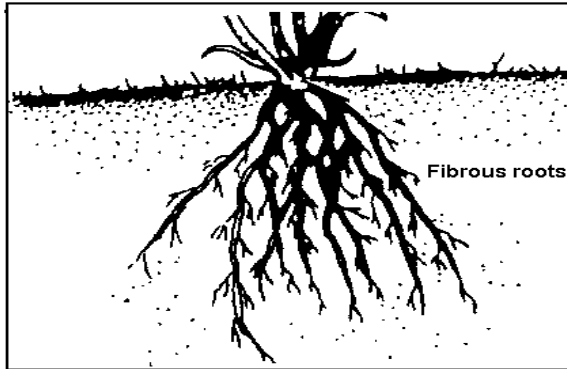
4. **What are fibrous roots?** This is a types of root system where there are many roots growing randomly having the same size and length without a main root.

5. **Name the examples of plants having fibrous root system.**

- Maize
- Millet
- Rice
- Sorghum

NOTE: Fibrous root system is common with monocotyledonous plants.

The fibrous root system.



Secondary roots

These are roots which develop from other parts of a plant but not the radical of a seed

List down the examples of adventitious roots.

- Prop roots
- Clasping roots
- Stilt roots
- ***Buttress roots***
- Roots of yams
- Roots of corns
- Roots of rhizomes
- Roots of bulbs

What are aerial roots? These are adventitious roots which appear above the ground of the plant.

Examples of aerial roots

- Prop roots
- Clasping roots
- Breathing roots
- Stilt roots
- Buttress roots

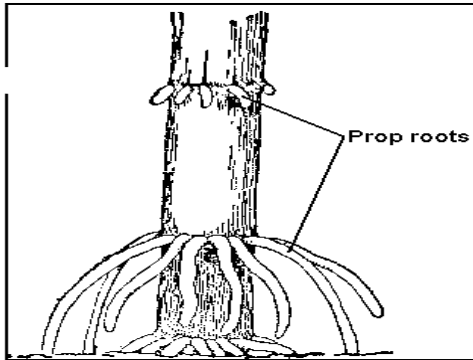
NOTE: (i) Every growing root is protected from mechanical injury by a root cap.

(ii) The main functions of root hairs is to absorb water and mineral salts from the soil.

6. **The prop roots:** these are roots that develop from nodes of plants near the ground during the time of flowering plants with prop roots.

- Maize
- Millet (Finger millet)
- Rice
- Sorghum
- Wheat
- Sugarcane

NOTE: The main function of prop roots is to give extra support to the plants.



Buttress roots

These are part of the shoot system which enlarges above the ground.

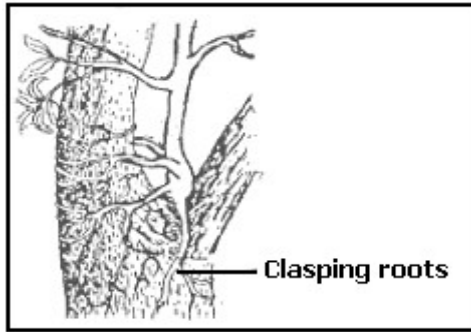
NOTE; (i) Buttress roots give extra support to the plants.

(ii) Buttress roots are common on silk cotton trees, mahogany ie



(a) Clasping roots

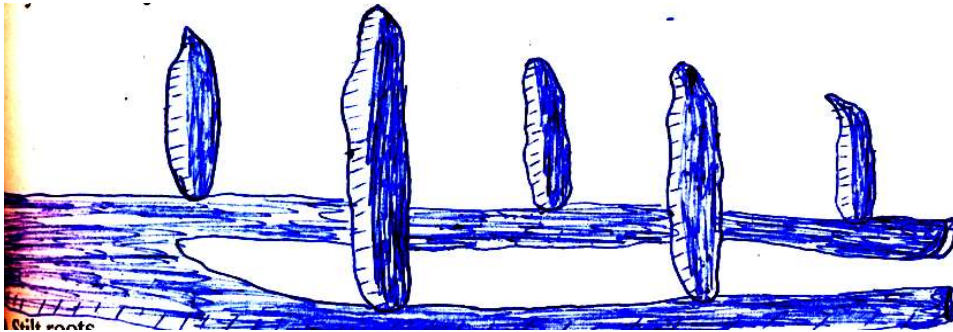
- These are roots found on climbing plants.
- They enable the plant climb by growing round and clasping for support ie.



e.g Fig trees

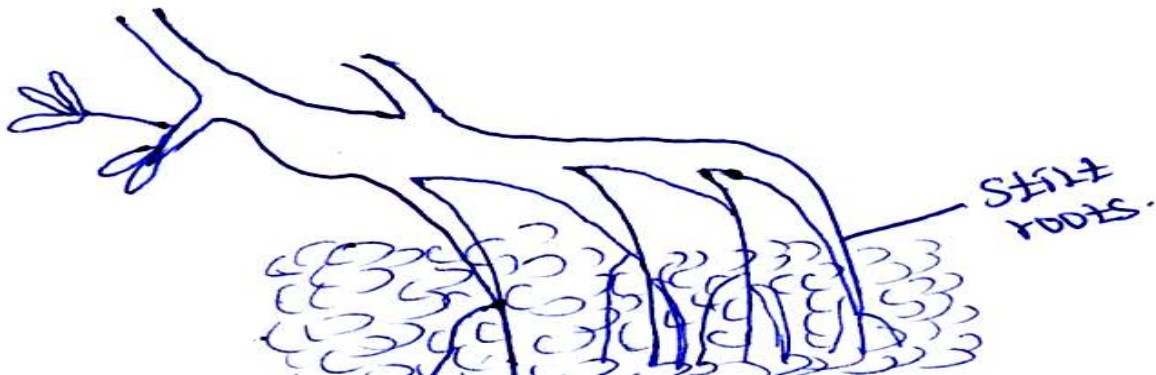
(b) Breathing roots

- These are only aerial roots because they grow upwards and act as breathing organs.
- They are mainly found in plants growing in water logged areas e.g mangrove trees.



(c) Stilt roots

- These are roots that develop from the stems of plants that grow in swampy (muddy) places.
- They help to give extra support to the plants e.g Red mangrove trees.



Importance of roots to man.

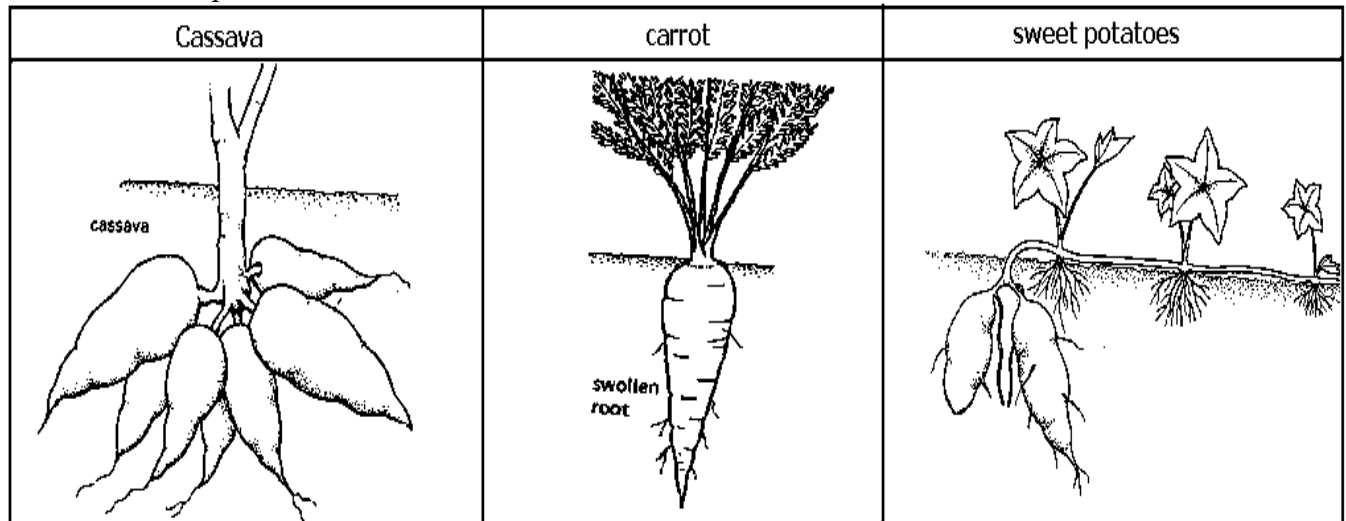
Activity

1. What is a tap root?
2. Draw a tap root, and name its parts
3. State the function of prop roots to a plant.

4. Give two examples of plants with
 - a. Tap root system
 - b. Fibrous root system
 - c. Prop roots

1. STORAGE ROOTS(PRACTICAL – OSMOSIS)

- These are special roots that are swollen and store food.
 - A root tuber is swollen root containing stored food.
2. Examples of root tubers
- Cassava
 - Carrots
 - Sweet potatoes



3. What is Osmosis?

Osmosis is the movement of water molecules from an area of low salt concentration to an area with a high salt concentration through a semi permeable membrane.

4. By what process do root hairs of plants absorb water and mineral salts from the soil?

- By osmosis

5. How is osmosis useful to plants?

It helps plants to absorb water and mineral salts from the soil.

6. How is water able to move from the soil to roots and up to the leaves?

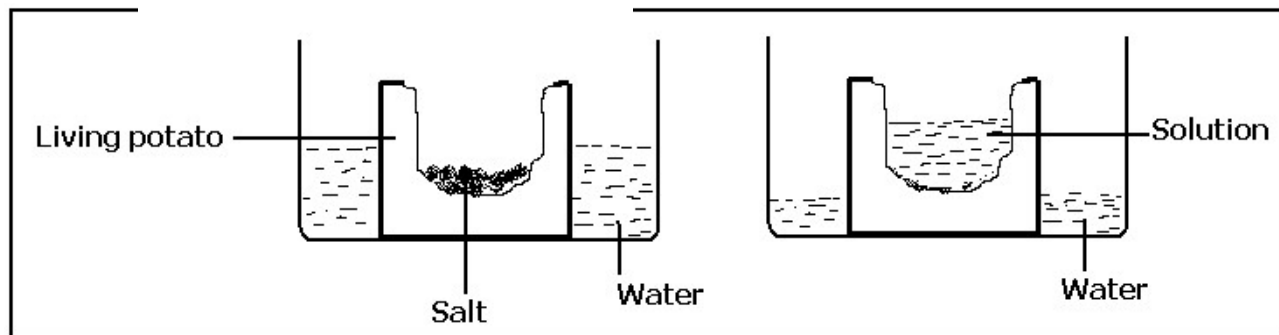
It is by capillary attraction/ by osmotic pressure.

7. How useful are roots to man?

- Some roots are used as food to man.
- Some roots are used as local medicine.
- Some roots store bacteria which makes soil fertile.

Activity

Study the diagram below and answer questions that follow.



- Identify the experiment above.
- Of what importance is the process above to plants?
- Why is the water able to pass through the peeled potato?
- What would happen if the potato was boiled?
 - What is storage root?
 - Give any two examples of root tubers
 - Define osmosis
 - Identify two ways osmosis is useful to plants.

STEMS

These are aerial parts of a plant which develop from the plumules.

Importance of stems to plants.

- Holds the leaves to get sunlight.
- Holds flowers and fruits for proper pollination and dispersal.
- Conducts water and mineral salts to leaves.
- Conducts food and oxygen from leaves to other parts of the plant.
- Some stems store food for the plant.

Parts of the stem

Nodes

Internodes

Axillary buds

Leaves

NB

The lateral bud develops into a new branch

Types of stems

- Upright or erect stem.
- Climbing or creeping stem.
- Underground stems

- Upright stems. These are stems that grow straight in space.

Examples of Erect stems

- Trees
- Beans
- Peas
- Soya beans
- Pine apples
- Maize
- Woody plants

Underground or storage stems

These are stems found under the ground e.g

- Stem tubers
- Bulbs
- Rhizomes
- Corms

Characteristics of underground stems

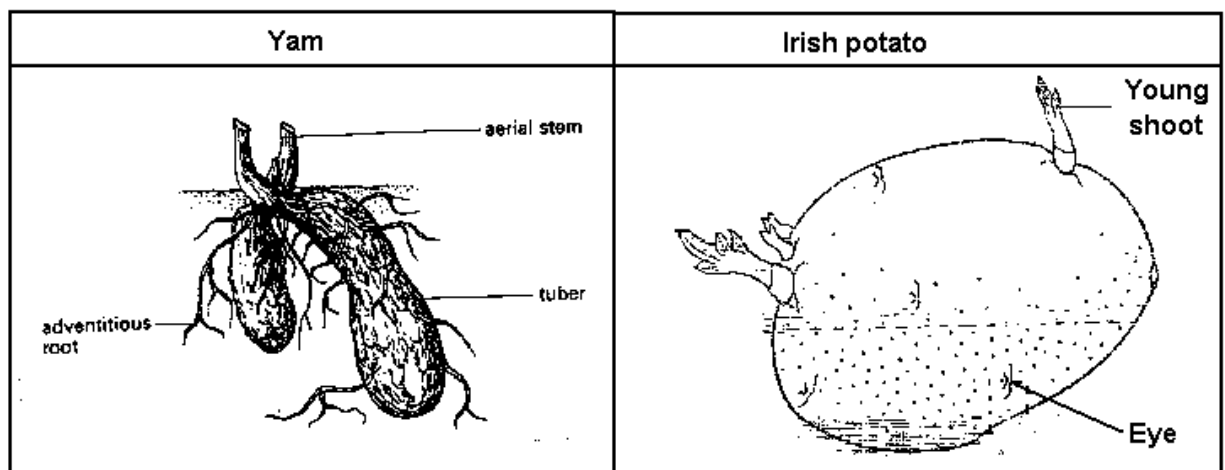
- Have scaly leaves at nodes.
- Have side shoots / buds / eyes in the axil.
- Have terminal buds which grow into a shoot.

Stem tubers

These are swollen underground stems that store food.

Examples include

- Irish potato
- White yam



Activity

1. What is a stem?
2. State any two uses of stems to a plant.
3. Give at least two types of stems
4. Identify four examples of underground stems

CLIMBING STEMS: These are weak stems which cannot support themselves upright.

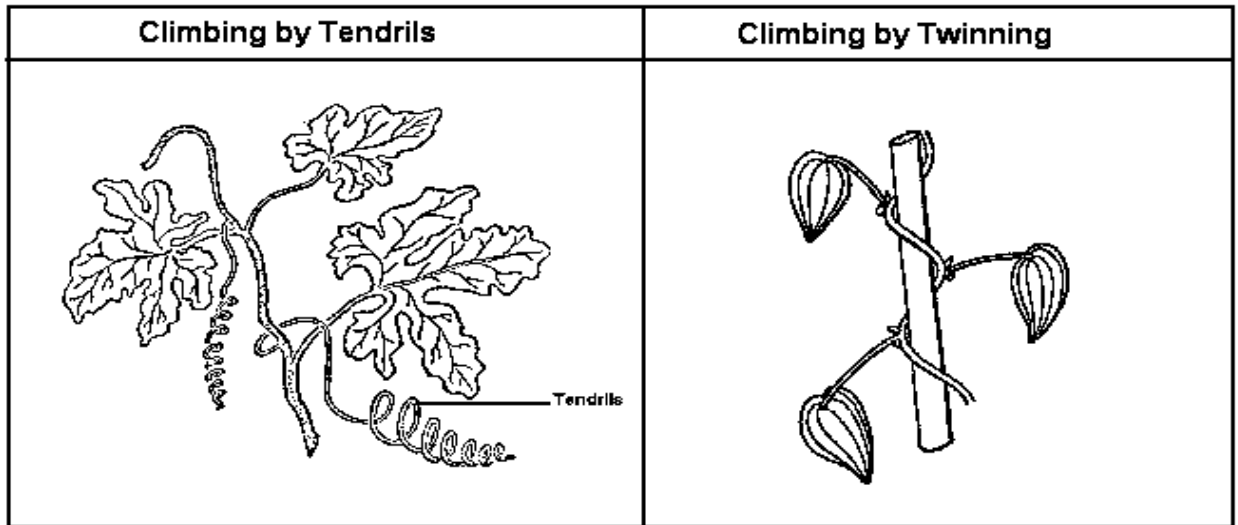
Reasons why plants climb others

- To get sunlight energy
- To expose flowers and fruits to agents of pollination and dispersal

Methods plants use to climb others

- Using tendrils
- Using hooks
- By *twining* / clasping

(a) Tendrils.



Plants which have tendrils.

- Passion fruits
- Pumpkins
- Cucumber
- Water melons
- Cowpeas
- Guards

(b) Hooks



Plants that twin.

- Beans
- White yam
- Tomatoes
- Morning glory

Uses of stems to man.

- Stems provide timber and firewood.
- Stems are as local medicine.
- Some stems are eaten as food.
- Stems provide food to man's (domestic animals)

Activity

1. What are climbing stems?
2. Give two reasons why plants climb others.
3. Identify the three methods used by plants for climbing
4. Name any two examples of plants that use tendrils for climbing.

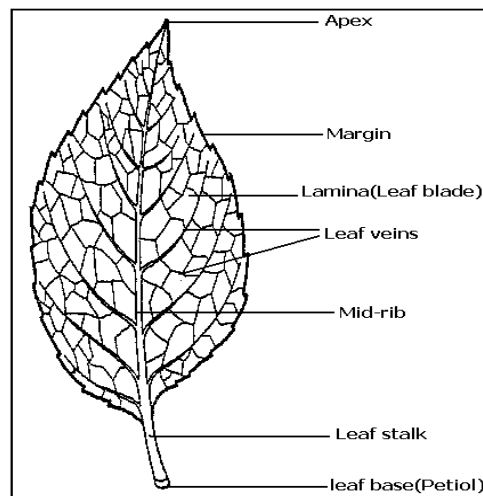
LEAVES

Functions of leaves to plants

- Leaves make food for the plant.
- Leaves *contain stomata which* allow in gaseous exchange in plants.
- Leaves help plants carry out transpiration *through the stomata*.
- Some leaves store food for the plant *e.g fleshy leaves of an onion*.

Some leaves help in plant propagation eg bryophyllum

Structure of a leaf



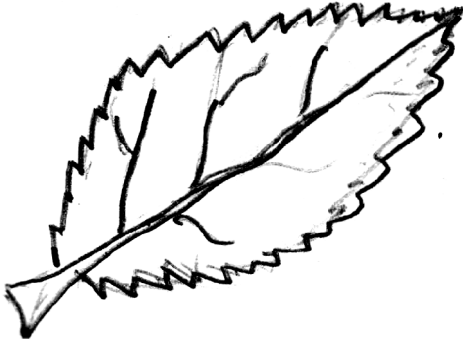
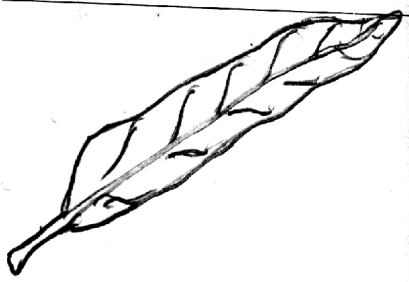



Types of leaves

- Simple leaves
- Compound leaves.

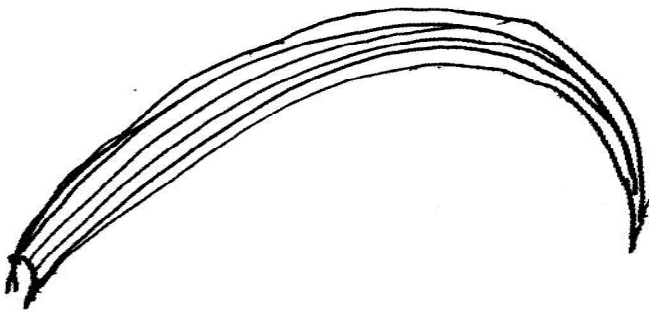
Simple leaves

These are leaves with one leaf blade / lamina on one leaf stalk (petiole) even when the leaf blade is divided.

Types of simple leaves

Simple <i>serrated</i>		Simple lobbed
		
Simple entire	Simple divided	Simple palmate
		

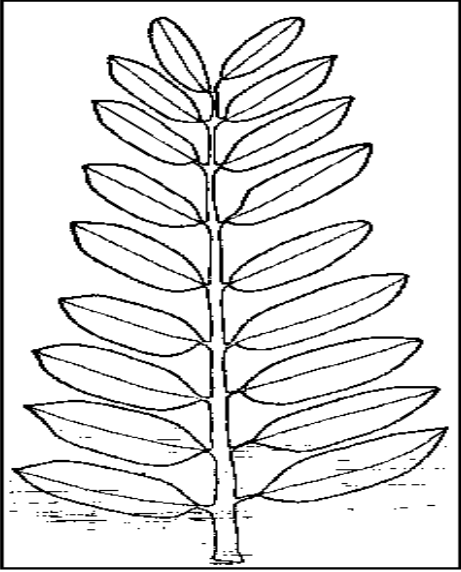
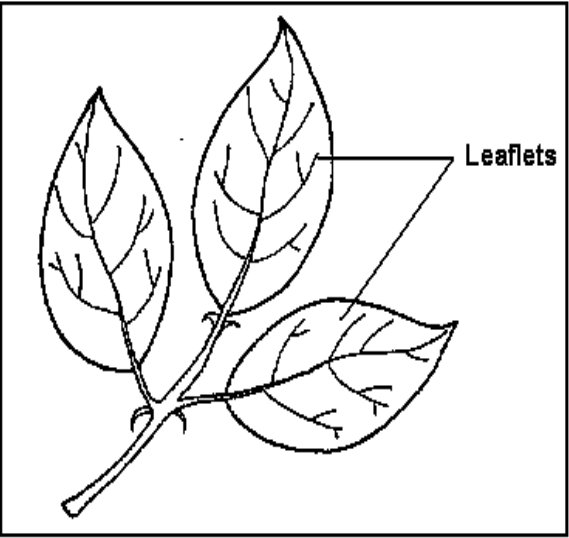
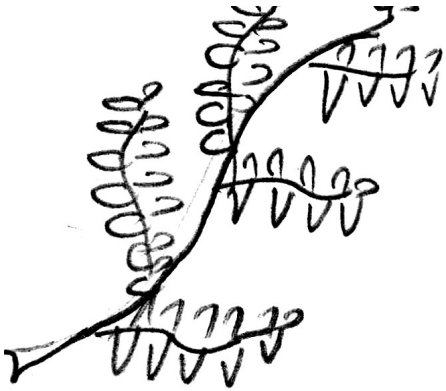
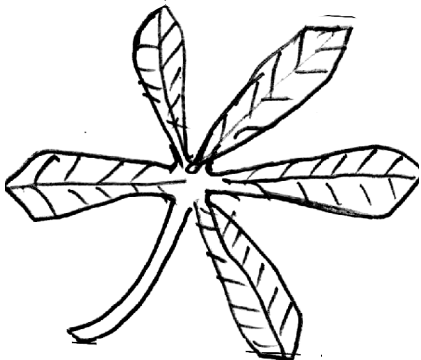
Simple lanceolate



Compound leaves

These are leaves with many leaflets on small leaf stalks that join to the main stalk. The small stalk for each leaf let is called rachis.

Types of compound leaves.

Compound pinnate.	Compound trifoliate
	
Compound bipinnate	Compound digitate
	



Uses of plant leaves to man

- Leaves are eaten as food.
- Leaves are used as *local medicine*.
- Leaves are used as food to domestic animals.
- Some leaves are used to thatch houses e.g spear grass and sword grass.

Leaf Venation

This is the arrangement of veins in leaves.

Types of leaf Venation

Net work leaf Venation	Parallel leaf Venation
	

N.B: *Examples of plants which have each type of venation*

Activity

1. Write down any four functions of leaves to a plant.
2. Name two types of leaves.
3. Identify any two uses of leaves to a plant \
4. Define leaf venation.
5. State the two types of leaf venation

Evaluation

- Strength
- Weakness
- Strategy

PHOTOSYNTHESIS

This is the process by which plants make their own food in the presence of sunlight energy.

Requirements for photosynthesis to take place

Photo means light

Synthesis means to make or to build up.

- Chlorophyll
- Sun light energy
- Water
- Carbon dioxide

Raw materials for photosynthesis to make place.

- Water
- Carbon dioxide

Products of photosynthesis

- Starch (end – product)
- Oxygen (by –product/ waste product)

Conditions for photosynthesis

- Chlorophyll (traps sunlight)
- Sunlight energy (splits water into gases e.e Hydrogen gas, oxygen gas)
- ***Speeds up the chemical reaction between water and carbondioxide.***

The food made during photosynthesis is called starch.

The gas given out during photosynthesis is oxygen.

Chlorophyll.

This is the green colouring matter found in plants.

The importance of chlorophyll is to trap sunlight energy.

Plants are unable to make food at night because there is no sunlight energy.

Some plants are able to make food at night because they use stored sunlight energy absorbed during the day.

Adaptations of leaves to photosynthesis

- They have a large surface area for absorbing sunlight energy.
- They are thin to allow carbondioxide reach the cells easily.
- Stomata are on lower side to allow exchange of gases.
- Have many veins to supply water and mineral salts.
- Well arranged on stems in position to get sun light energy.

Activity

1. What is photosynthesis?
2. Name the raw materials needed for photosynthesis
3. Why can't green plants make food at night?
4. Which gas is used by plants during night?
5. Identify any two adaptations of leaves to photosynthesis.

TRANSPIRATION(PRACTICAL)

This is the process by which plants lose water in form of water vapour into the atmosphere through the stomata.

Types of Transpiration

- Stomata transpiration (stomata)
- Reticular transpiration (pores on stems branches and fruits)
- Cuticle transpiration (cuticles)

Experiment on transpiration



After some time, droplets of water are found on the in Side of polythene bag. This indicates that water was being lost by the plant to the atmosphere, in form of Water vapour through the stomata.

Conclusion: *Transpiration was taking place.*

Advantages of transpiration to plants

- It cools the plant
- Increases osmosis
- It helps in rainfall formation

Importance of water in plants

- Used in photosynthesis.
- Dissolves food in cotyledons for the germinating embryo.
- Maintains the shape of plant cells.
- It dissolves and supplies mineral salts around the plant.

Factors that affect the rate of transpiration.

- Temperature
- Light
- Wind
- Surface area *of the leaves*
- Humidity
- Number of *stomata*.

(a) Transpiration is low during cold, dark and when air is still.

(b) Transpiration increases when it is hot, dry conditions, sunny and windy conditions.

How plants reduce the rate of transpiration.

- By shedding off their leaves during dry hot seasons.
- ***Reducing the size of leaves to thorns eg cactus.***
- Leaves have a layer of wax which helps to cover the stomata during windy and hot conditions.

NOTE:

(a) Deciduous plants / trees shed leaves during hot weather to reduce the rate of transpiration.

(b) Plants with big leaves lose water more easily because they have a larger surface area and many stomata than the small ones.

(c) If plants lose more water, they wilt and later dry up.

Activity

1. What is transpiration?
2. Name two types of transpiration.
3. Give three ways in which transpiration is important to plants.
4. Identify any 4 factors that affect the rate of transpiration

FRUITS (PRACTICAL)

A fruit is a developed ovary.

A fruit has two scars ie stalk scar and style scar i.e

Functions of fruits to plants.

- Protects the seeds.
- They aid seed dispersal.

Types of fruits

- Succulent fruits.
- Dry fruits.

Succulent fruits

These are fruits with a juicy pericarp that can be eaten.

Groups of succulent fruits.

- Berries
- Drupes
- Pomes

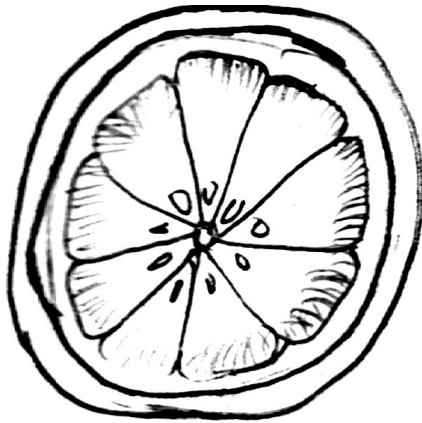
(a) Berries

These are fruits that have many seeds in them.

Examples of Berries.

- Tomatoes
- Oranges
- Paw paws
- Bananas
- Guaves

i.e



(b) Drupes: These are succulent fruits which have one big seed.

Examples of Drupes

- Mangoes
- Coconut ie
- Avocado
- *Oil palms*
- *Plumes*

(a) Pomes

These are fruits which develop from a receptacle

e.g – Apple

Why is an apple called a false fruit?

Dry fruits

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

Groups of dry fruits.

- Splitting fruits/ *Dehiscent fruit*
- Non splitting fruits/ *Indehiscent fruits*

(a) Splitting fruits

These are fruits whose pods split to disperse the seeds. They are also called dehiscent fruits.

Examples of splitting fruits

- Beans
- Castor oil
- Peas

(b) Non splitting fruits

These are fruits with only one seed and do not split. They are also called indehiscent fruits.

Examples of non splitting fruits

- Black jack
- Maize
- Sun flower
- Tridax

Other fruits

(a) **Simple fruits** are fruits formed from one flower e.g. tomatoes, mangoes and lemons.

(b) Compound fruits (multiple fruits)

These are fruits where all the flowers on a stalk form one fruit e.g. pine apple.

(c) False fruits

These are fruits which are not formed from the ovary of a flower.

Activity

1. What is a fruit?
2. Name two types of fruits
3. Give three examples of the following fruits;
 - a. Berries
 - b. Drupes
 - c. Pomes

SEEDS AND FRUIT DISPERSAL

This is the scattering of fruits and seeds away from the parent plant over a wide area.

Methods of seed dispersal

- Animals dispersal
- Wind dispersal
- Water dispersal
- Explosive mechanism (self dispersal)

Importance of seed dispersal.

- Controls over crowding of plants
- Reduces competition for light and plant nutrients.
- Enables plants to colonise new areas.
- Reduces epidemic diseases among seedlings.
- Increases chances of survival of species.

Agents of seed dispersal

- *Animals*
- *Wind*
- *Water*
- *Explosive mechanism*

Characteristics of seeds dispersed by animals.

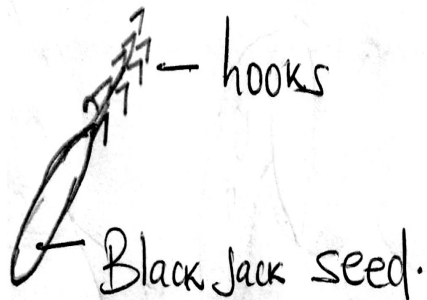
- Most are succulent and have scent in them.
- They are brightly coloured when ripe.

- Some have hard coats surrounding their seeds.
- Some have hooks on their seed coats.

Examples of fruits / seeds dispersed by animals.

- Mangoes
- Guavas
- Tomatoes
- Paw paws
- Jack fruits
- Passion fruits
- Black jack
- Bidens pilosa
- Boehavia

i.e



Characteristics of seeds dispersed by wind.

- They are small and light.
- Some have a tuft of hair.
- Some have parachute like hair.
- Some have wing like floating structures.

i.e



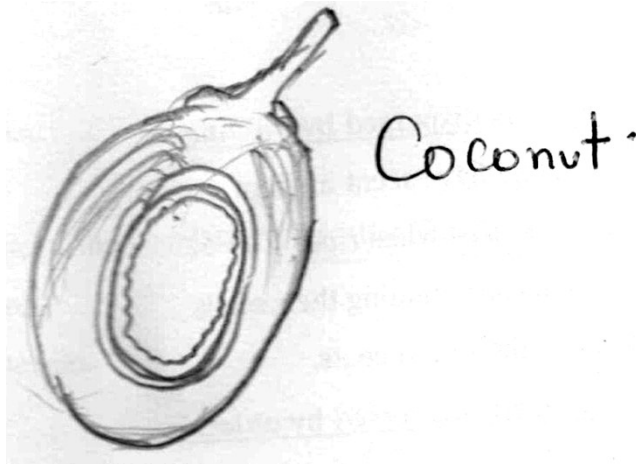
Examples

- tridax
- cotton seed
- dandelion
- jacaranda
- nandi flame seeds

Characteristics of seeds dispersed by water.

- They are light.

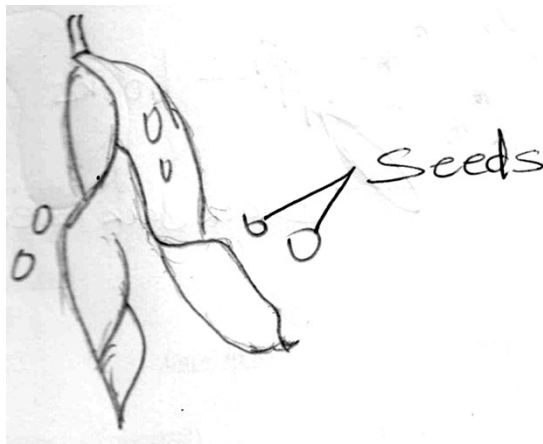
- They have air tight covering.
 - They have many air spaces in the mesocarp.
- i.e



Characteristics of seeds which undergo self dispersal.

They split open with force and throw the seeds at a distance.

i.e



e.g - Seeds fallings

- Peas
- Beans
- Acacia
- Cassava
- Castor oil

Activity

1. What is seed dispersal?
2. Name any four methods of seed dispersal.
3. Give any two agents of seed dispersal.
4. Write down any four importance of seed dispersal.

PLANT PROPAGATION

*Propagation is a way of obtaining new plants from the parent plants.
The way plants are planted*

Types Of Propagation

- i. *Vegetative propagation*
- ii. *Use of seeds. (sexual propagation)*

Sexual propagation

This is the type of propagation where seeds are planted.

Examples of plants propagated by planting seeds

- Maize
- Beans
- Soya beans
- Ground nuts
- Peas
- Passion fruits

Advantages of sexual propagation

- Seeds can survive disasters like draught
- There is no / little competition among off springs
- New varieties are produced
- Chances of colonizing new areas are high as a result of dispersal

Disadvantages of sexual propagation

- It is a slower means of propagation
- Parental food supply to seedlings is limited.
- It requires agent of pollination or dispersal.

Vegetative propagation is when part of a plant is used to produce new ones, other than seeds

Types of vegetative propagation

- *Natural vegetative propagation*
- *Artificial vegetative propagation*

Natural vegetative propagation.

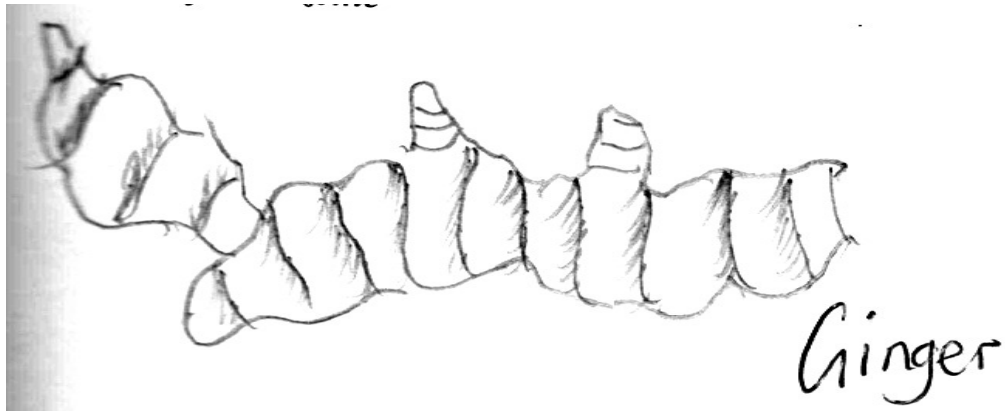
- *Rhizomes*
- *Bulbs*
- *Corms*
- *Suckers*
- *Leaves*
- *Stem tubers*

- a. **Rhizomes.** *This is a horizontal underground system with adventitious roots growing from stem and nodes.*

Examples of plants propagated by planting rhizomes

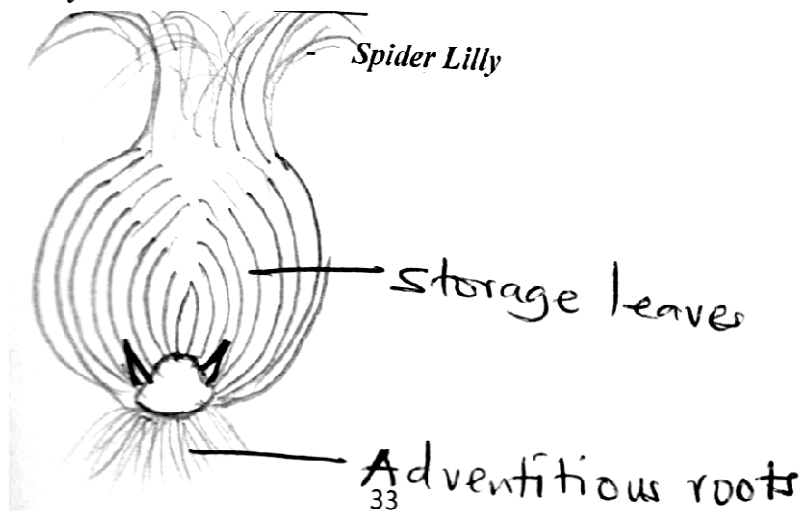
- *Ginger*
- *Canalily*
- *Zoyzia*
- *Turmeric*

Structure of a Rhizome



b. **Bulbs.** These are underground small stems with swollen fleshy leaves that store food.
Examples of plant propagation by bulbs.

- Onion
- Garlic
- Spider Lilly



c. **Corms.** These are short swollen underground stems with stored food.

Examples of corms

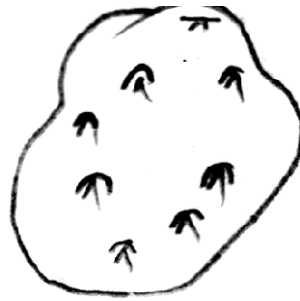
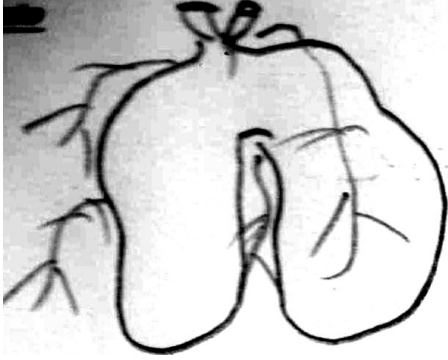
- Cocoyams
- Gladiolus
- crocus

d. **Stem Tubers.** Are swollen underground stems with stored food . they are propagated by using stem tubers.

Examples

- White yams
- Irish potatoes

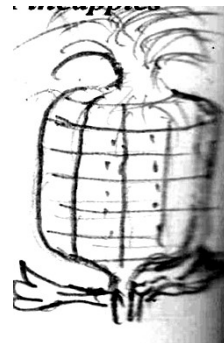
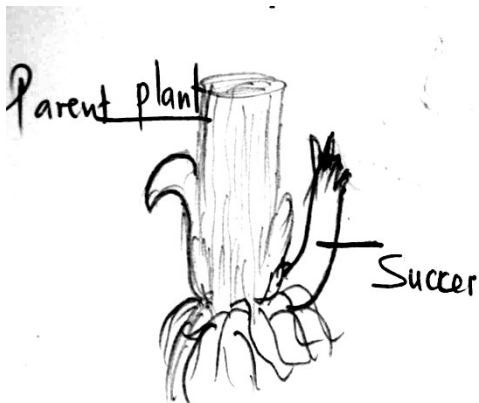
Irish potato



e. **Suckers.** These are lateral branches with terminal bulbs which grow from the base of under ground of plants.

Examples

- Banana plant
- Sisal
- Pineapples



f. ***By leaves some plants are propagated by leaves e.g. Bryophyllum***

PLANT LIFE (FLOWERING PLANTS)

- bear
- mosses
- lichens
- ferns
- conifers
- cypress
- axillary bud
- fibrous roots
- internode
- radicle
- rhizomes
- adventitious
- root hair

- root cap
- osmosis
- tuber
- aerial root
- creeping
- corns
- tendrils
- hooks
- raw materials
- stoma
- reticular
- cuticle
- transpiration
- succulent
- drupes
- berries
- hooks
- scion
- hibiscus flower

ARTIFICIAL VEGETATIVE PROPAGATION

Methods used include:- *Stem cuttings, Grafting, Budding, Layering, Marcotting, Stem cutting.* These are short pieces of stems which have nodes and auxiliary buds which grow into new plants when planted into soil.

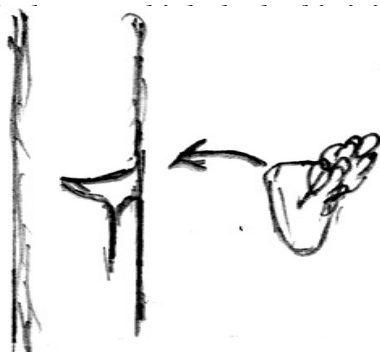
E.g.

cassava Stem

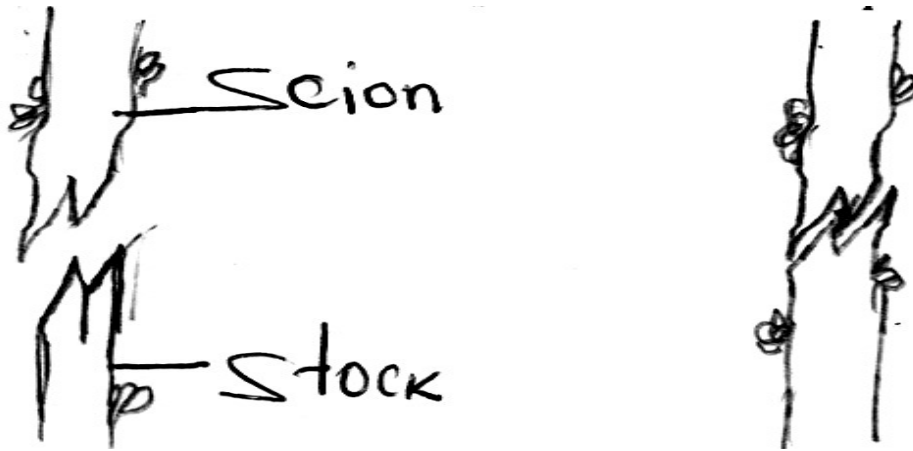
- Sugar Cane
- Sweet Potatoes
- Roses
- Hibiscus flower.

Budding. This is when a dormant bud from one plant is joined to another plant with good and developed root system.

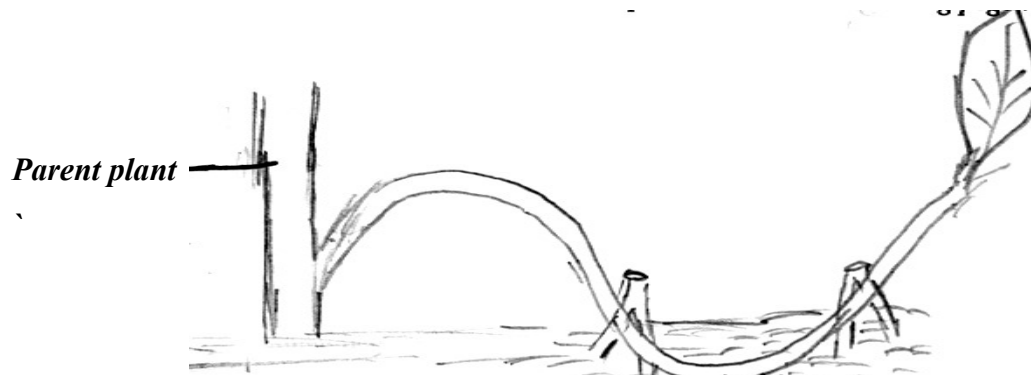
A plant from which the bud is taken is called a scion.



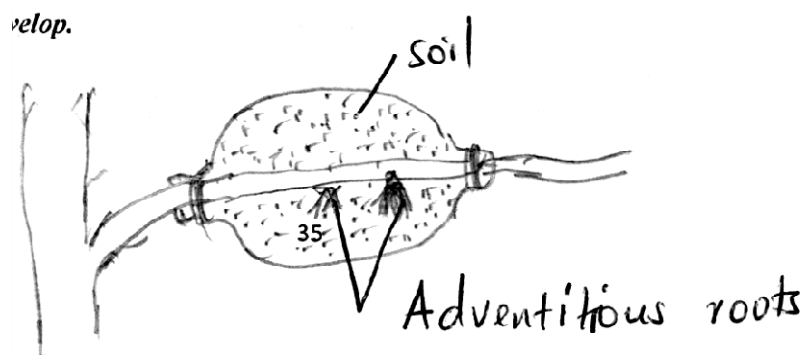
Grafting. This involves joining part of one plant on to another plant of the same species.



Layering. This is when a branch from a mother plant is bent into soil using pegs until roots develop.



Marcotting. Is when the bark of a plant is cut, the branches tied with fertile soils and adventitious roots develop.



CATTLE KEEPING

CATTLE

Animal husbandry is the keeping of farm animals or livestock e.g cattle, sheep, goats, pigs and rabbits.

Cattle keeping.

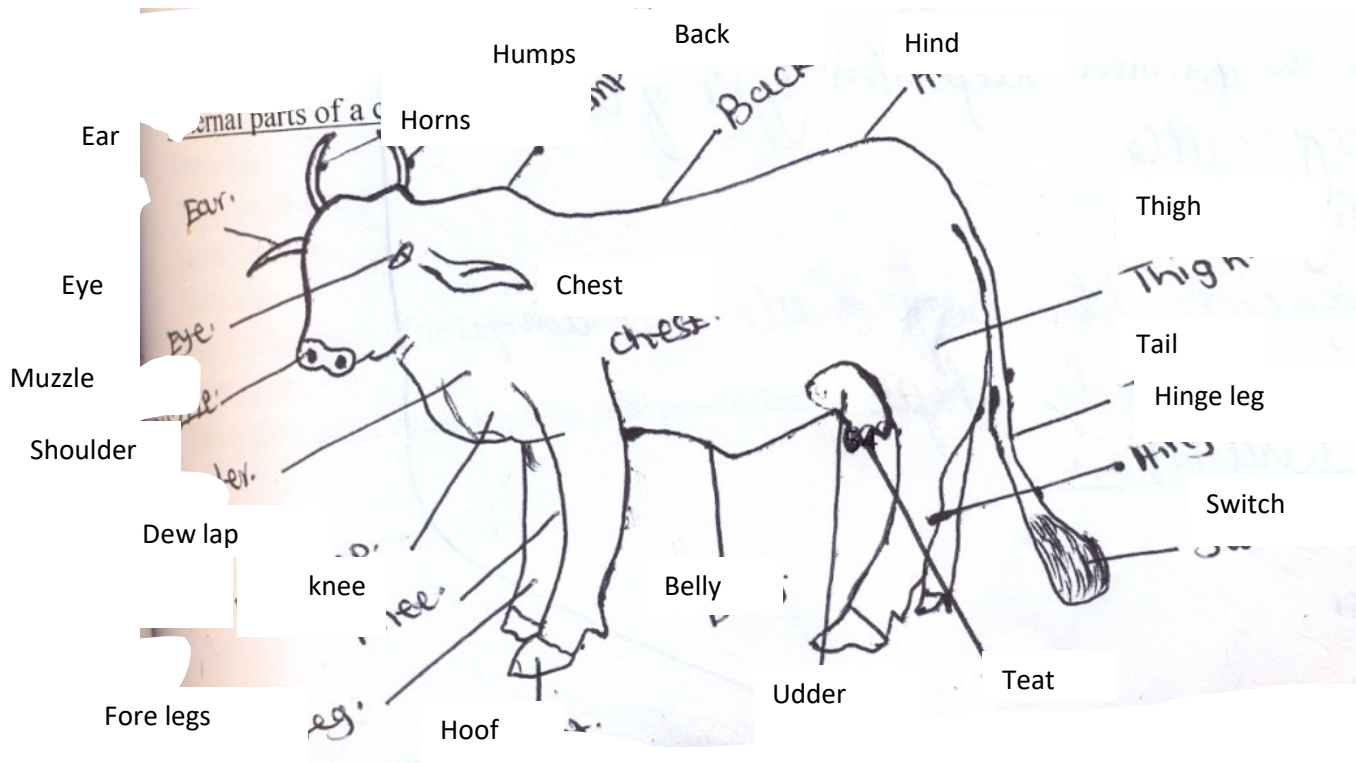
This is the ***rearing*** of cows, bulls, bullocks, heifers, calves and oxen ie

- (i) Bullocks are young castrated male cattle.
- (ii) Heifers are young female cattle.
- (iii) A calf is a young of a cattle.
- (iv) Oxen are cattle used for ploughing gardens.

Importance of cattle keeping.

- We get meat and milk eaten as food.
- Cattle keeping provides employment to farmers.
- Dung is used as source of farmyard manure in the improvement of soil fertility.
- Cattle keeping provides cheap labour in ploughing and transportation of goods.
- Bones, horns and hooves are used in the production of animal feeds and glue.
- Hides from cattle are used in making leather.
- Cattle keeping is practical for customary purposes like dowry.

External parts of a cow.



Activity

1. What is animal husbandry?
2. Explain the following
 - a. Bullock

- b. Heifers
 - c. Calf
 - d. Oxen
3. Why do people keep cattle? Give any six.

TYPES OF CATTLE

A type of cattle is a class of cattle kept for a specific purpose.

Types of cattle.

- Dairy cattle.
- Beef cattle
- Dual purpose cattle
- Draught cattle.

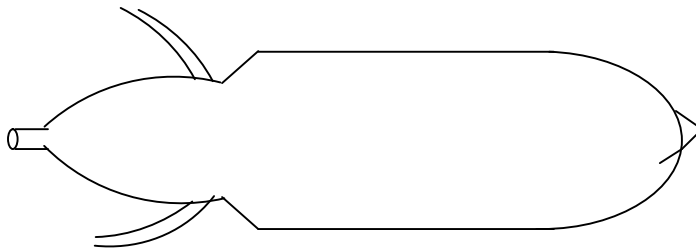
(a) Beef cattle.

These are cattle kept mainly for beef production.

Characteristics of beef cattle.

- They are rectangular in shape.
- They have small heads.
- Have short legs with long broad backs.
- Have the ability to survive drought without losing weight.

Beef cattle body conformation



Examples of beef cattle.

- Hereford
- Boran
- Galloway
- Charolais
- AmericanBraham
- Santa Gertrudis
- Short horn

NOTE: The local cattle kept for beef production is the Boran.

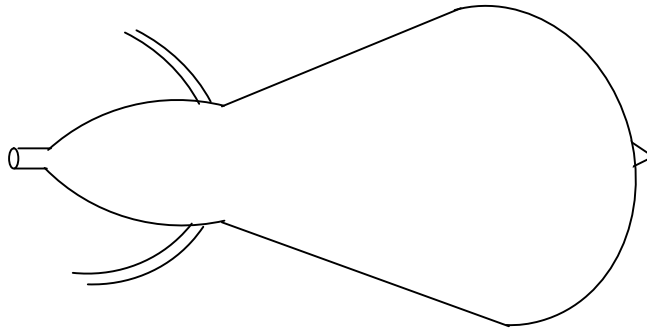
(b) Dairy cattle

This is the type of cattle kept for milk production.

Characteristics of Dairy cattle

- They have a big udder.
- Have larger hind quarters
- Have a triangular shape.

Dairy cattle body conformation.



Examples of Dairy Cattle.

- Friesian
- Ayrshire
- Jersey
- Brown swiss
- Guernsey

NOTE: (i) Friesian produces the highest amount of milk.

(ii) Jersey produces the highest fat content in milk.

(c) Dual purpose cattle.

These are cattle kept for both meat and milk production.

Examples of Dual purpose cattle

- Sahiwal
- Red poll
- Short horn
- Zebu cattle
- Ankole cattle
- Barom

(d) Drought cattle.

These are cattle which are trained for labour e.g ploughing, pulling carts, transport.

Examples of Drought cattle.

- Oxen.

Activity

1. What is a type of cattle?
2. Name any three types of cattle
3. Give any two characteristics of beef cattle.
4. Write down any four examples of beef cattle
5. Why do farmers keep this types of cattle?
 - a) Beef cattle
 - b) Dairy cattle
6. Differentiate between beef cattle and dairy cattle using body shape.

BREEDS OF CATTLE.

A breed of cattle is a family of cattle with similar characteristics

Types of Breeds of cattle.

- Indigenous cattle
- Exotic cattle
- Cross breeds.

Characteristics of breeds of cattle

- *They have specific colours*

Differences between exotic breeds and local breeds of cattle.

Exotic Breed	Local Breed
1. Have specific colours 2. Take short time to mature 3. Produce a lot of milk and their meat is tender or soft. 4. <i>Are less resistant to</i> diseases. 5. Need good pasture and plenty of water drink. 6. <i>less resistant to harsh conditions</i>	1. Have different colours. 2. Take long time to mature. 3. Produce little milk and their meat is not soft. 4. Are <i>more</i> resistant to most tropical diseases. 5. Can survive on poor pasture and little water. 7. <i>More resistant to harsh conditions</i>

(a) Indigenous or local breeds of cattle.

Are cattle that have been in Uganda for a long time.

Examples of local breeds of cattle

- Zebu cattle in Teso.
- Boran cattle in Karamoja.
- Long horned cattle of Ankole.
- Nganda cattle in central.

Advantages of local breeds of cattle.

- They are resistant to diseases.
- They are resistant to drought.
- Can survive on poor pasture and less water.
- Easy to keep and manage.

Disadvantages of local cattle.

- Produce less milk.
- Produce less meat.
- Maturity is slow.

(b) Exotic breeds of cattle are cattle that have been imported into Uganda from other countries.

Examples of Exotic breeds of cattle.

- Friesian
- *Jersey*
- Brown swiss
- Hereford
- Aberdeen *Angus*
- Guernsey

Advantages of exotic breeds of cattle

- Mature faster.
- Produce a lot of meat and milk.

Disadvantages of exotic breeds of cattle

- Easily attacked by diseases.
- Less resistant to harsh weather

Activity

1. What is a breed?
2. Give a difference between a breed and a type of cattle
3. Write down any three examples of breed of cattle
4. State the differences between exotic breeds and local breeds.

Cross breeds

These are cattle that have been produced by exotic breeds mating with indigenous breeds.

- The product of cross breeding exotic breeds with local breeds is the ***crossbreed***.
- In order to improve on the local breeds of cattle, we have to cross breed them.

Qualities of / cross breeds of cattle with other animals related to cattle eg. off spreading from a cow and a Buffalo

- They mature faster
- Have a bigger body shape.
- Produce a lot of meat and milk.

BREEDING IN CATTLE

Breeding is the mating of selected animals in a planned manner in order to keep the inherited characteristics of cattle e.g colour, resistance to diseases and milk production.

Breeding methods in cattle keeping.

- (a) **In breeding** is the mating of closely related animals like brothers and sisters.
- (b) **Line- breeding** is the mating of distantly related animals that had a common ancestor ie grand daughter + grandson or cousins.
- (c) **Cross breeding** is the mating of unrelated animals of different breeds ie exotic and local.
- (d) **Out breeding** is the mating of different families of animals but of the same breed.
- (e) **Up (grading)** is the mating of local and exotic breeds for a long time.

Problems or factors affecting cattle keeping.

- Pests and diseases
- Poor transport
- Shortage of ready market
- Poor climate / drought
- Poor grass land
- Shortage of enough capital
- Ignorance ie belief in keeping many cattle e.g Ankole and Karamonja.

Requirements for starting up a cattle farm.

- Availability of land
- Availability of Labour
- Availability of Transport
- presence of Capital
- presence of Water supply in or near the farm
- Security of your cattle and employees.

Activity

1. What are cross breeds?
2. State any two qualities of cross breeds
3. Explain the following terms
 - a. Breeding
 - b. Inbreeding
 - c. Cross breeding

- d. Out breeding
4. Point out problems affecting cattle keeping in Uganda.
5. Suggest possible solutions to the above

REPRODUCTION IN CATTLE.

This is the process by which animals multiply by producing young ones similar to themselves.

Servicing or insemination.

This is the act of depositing sperms into the vagina of a cow.

Types of insemination.

- Natural insemination.
- Artificial insemination.

(a) Natural insemination.

This is when a bull uses its penis to deposit semen (sperms) into the vagina of a cow on heat.

Advantages of natural insemination

- Easy for the bull to deposit semen.
- It is cheap as bulls are kept on the farm.
- It fulfills the natural feelings of the bull.
- It is easy for the bull to notice the signs of heat on a cow.

Disadvantages of natural insemination

- It encourages in breeding.
- It leads to spread of venereal diseases
- Leads to injuries to small cows *by heavy bulls*
- It is expensive if you don't own a bull.

(b) Artificial insemination is when a qualified person uses a syringe to deposit sperms into the vagina of a cow on heat.

Advantages of Artificial insemination.

- It prevents injuries to *heifers by big bulls*.
- It prevents venereal diseases.
- Controls in breeding.
- Reduces the costs of keeping a bull.
- Only semen from a good bull is used.

Disadvantages of Artificial insemination

- Only requires trained personnel.
- Poor storage of semen leads to the death of sperms.
- Insemination may be *done* at a wrong time.

HEAT PERIOD(OESTRUS PERIOD)

This is when a mature female cow is ready to be serviced by the male so as to conceive.

Signs of Heat (Oestrus) period in cows.

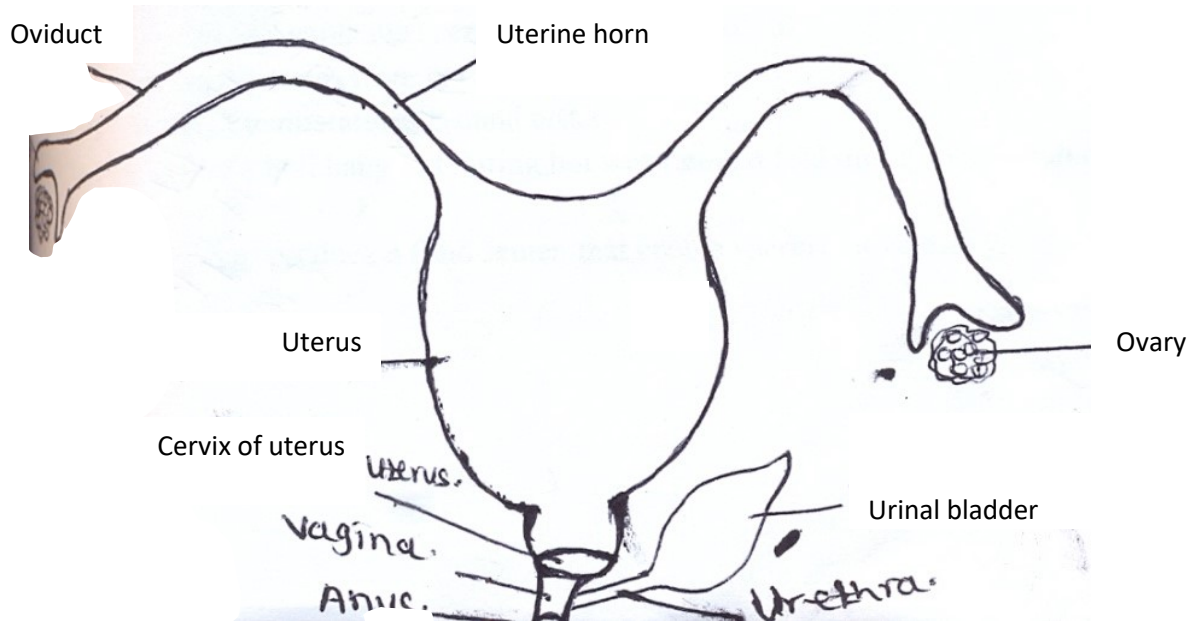
- Frequent urinating.
- Mounts others - It makes a lot of noise (bellows).
- It becomes restless
- Loss of appetite.
- Reduction of milk production.
- Temperature *of a cow rises*.
- Mucus discharge from the vagina.
- Swollen vulva.
- It stands still when mounted.

Activity

1. What is reproduction?
2. Explain the term “insemination”
3. Name the two types of insemination
4. Write A.I in full.
5. Give any four advantages of A.I
6. Identify any three signs of a cow on heat

REPRODUCTIVE ORGANS OF CATTLE.

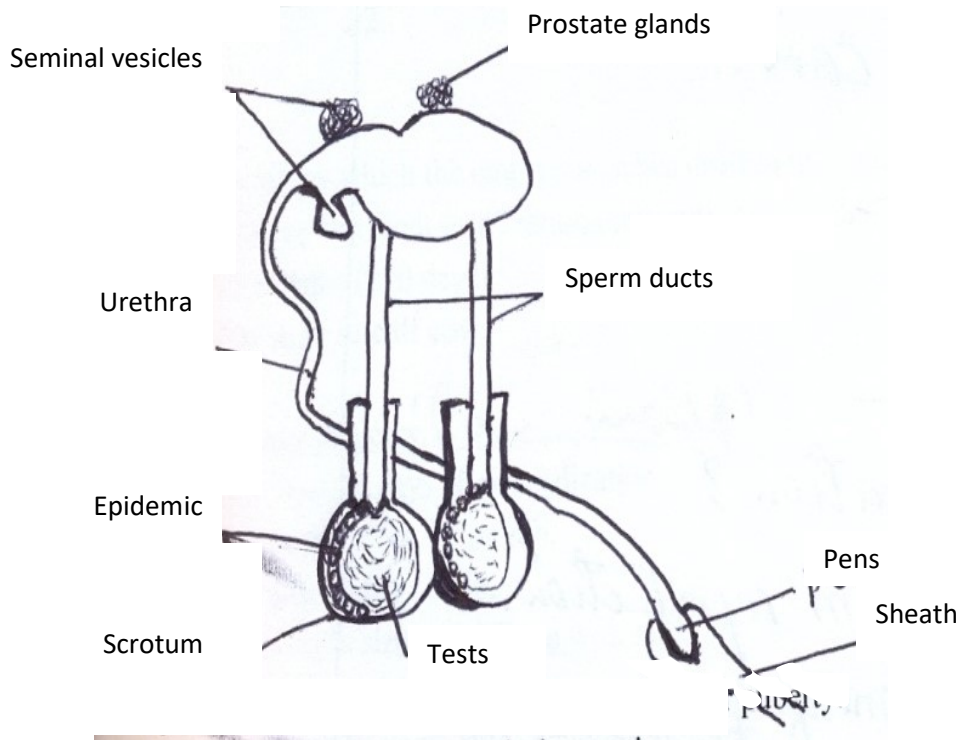
(a) The female reproductive organs of a cow.



Functions of Each part.

- (a) **Vulva** receives and directs the penis inside the vagina.
- (b) **Hymen** membrane that breaks as the penis enters for the first time.
- (c) **Vagina** it is a birth canal and where sperms are deposited.
- (d) **Urinary bladder** is a muscular bag that stores urine.
- (e) **Cervix** closes the lower end of uterus to prevent injury to foetus when pregnant.
- (f) **Uterus (womb)** is where embryo or zygote grows from.
- (g) **Oviduct** is where fertilization takes place.
- (h) **Funnel** receives the eggs as it leaves the ovary.
- (i) **Ovary**
 - Produces eggs / ova.
 - Produces hormones or chemical substances which control sexual cycle.

The male reproductive organ of a bull.



- (a) **Testis** produce sperms and a hormone responsible for puberty.
- (b) **Urethra** is the passage for sperms during mating.
 - It also passes out urine.
- (c) **Penis** deposits semen containing sperms into the vagina during copulation.
- (d) **Sperm ducts** conduct semen containing to the urethra.
- (e) **Epididymis** stores and cools the sperms read for ejaculation.
- (f) **Scrotum** protects the testes from harm.
 - It also regulates the temperatures around testis.

NOTE: Scrotum of a bull hang out during hot weather and fold during cold weather to regulate the temperature around testis.

- (g) **Glands and Vesicles** produce a fluid semen that enable sperms move easily.
Testosterone hormone also increases the desire for mating in bulbs.
Mating is the joining of male and female organs.

Activity

1. Name the male and female reproductive cells of cattle
 - i) Male
 - ii) Female
2. Give the functions of the following parts of a reproductive system.
 - a) Ovary
 - b) Cervix
 - c) Bladder
 - d) Testis

FERTILISATION

This is the union of *the nuclei of the* male and female gametes to form a zygote.

NOTE: Gametes are reproductive cells.

- (a) The female reproductive cells are the Egg cell or Ova.
- (b) The male reproductive cells are the sperm cell.

Conception

This is the process by which *a fertilized ovum sub divides itself into smaller cells.*

It takes place in the uterus.

Implantation.

This is the process by which the embryo attaches itself to the walls of the uterus.

Pregnancy is the period from fertilization (conception) to birth.

A period of pregnancy is also called gestation period.

- For a cow is 9 months (270 days).
- A pregnant cow is an in-calf cow.

Signs of pregnancy in a cow (an in calf)

- It stops going to heat 21 days after fertilization.
- Uterus enlarges in the 2nd or 3rd month.
- There is mucus around the cervix.
- The udder increases in size and fills up with milk.
- The cervix closes up during pregnancy.
- Foetus starts moving in womb from 7 months onwards.

Calving is the act of giving birth to a calf by a cow.

A cow in its milking period is also known as a lactating cow.

Steaming up is the feeding of a dry cow on protein rich food.

Why do we steam up a cow?

- *To stimulate milk production*
- *To promote proper growth of the foetus.*

A dry cow is that cow which has been stopped from milking.

Advantages of steaming up.

- A cow builds up its body for the next calving.
- Encourages the foetus to grow healthy.
- Lengthens the lactation period of a cow.
- Leads to increased milk production.
- Prevents low birth weight.

Signs of calving in a cow.

- Udder and teats swell.
- Vulva enlarges and becomes red.
- It becomes restless.
- It isolates itself from others.
- Colostrum comes out of teats when squeezed.
- The cow stops grazing.

N.B: Colostrum is the first milk produced by a cow immediately after calving.

Importance or advantages of colostrums.

- It is easy to digest by the calf
- It contains antibodies *which help to boost the immunity of a calf.*
- It contains *all food values.*
- It is rich in proteins, carbohydrates, fats and mineral salts than other ordinary milk.

Other terms used in relation to calving

- *Kidding – giving birth in goats*
- *Lambing – giving birth in sheep*
- *Farrowing – giving birth in pigs*
- *Kindling – giving birth in rabbits.*

Activity

1. What is fertilization?
2. What are gametes in reproduction?
3. State any two signs of pregnancy in a cow.
4. Explain the following:-
 - i) Calving
 - ii) Steaming up
 - iii) A dry cow

CARE FOR CATTLE

Qualities

- By feeding them.
- By giving them water.
- By housing the calves.
- By fencing their grazing areas.

Examples of cattle feeds.

- (a) **Concentrates** e.g cereals, legumes and oil seeds.
- (b) **Roughages** (fibrous foods) eg young grass, hay, dry maize stalk, silage, legumes.
 Hay is grass cut and dried to feed animals during dry seasons.
- (c) **Succulents** e.g sweet potatoes, banana peelings, cassava peelings.

PASTURE

This is an open grass land where animals can freely graze.

Types of pasture

- Natural pasture
- Prepared pasture.

Natural pasture is that grass that grows by itself and is eaten in its raw form.

Examples of Natural pasture.

- Kikuyu grass
- Rhodes grass
- Guinea grass
- Nandi grass
- Elephant grass

- Guatemala
- Alfalfa

Prepared pasture is made out of fodder crops. Fodder crops are crops grown for feeding animals.

Examples of fodder crops.

- Maize silage
- Sorghum
- Oats
- Hay
- Millet
- Sweet potatoes
- Napier grass
- Clover.

Importance of pasture

- It is food for animals.
- It controls soil erosion.
- It can be used for bedding and thatching animal houses.
- Land poor for growing crops can be left for pasture.
- Pasture adds humus to the soil.
- Legume pastures help to fix nitrogen into the soil.

Activity

1. State any four ways of caring for cattle.
2. What is pasture?
3. Give any two importance of pasture.

CATTLE HOUSING

Requirements of a good cattle house

- Wide enough.
- Well drained land.
- Well ventilated.
- Have a cemented floor for easy cleaning.
- Have a starting floor to enable urine drain.
- A cattle house is called a byre.

Importance of housing in cattle keeping

- Protects animals against bad weather.
- Protects animals against predators, pests and disease vectors.
- Acts as a store for farm produce, records, food and tools.
- Acts as calf pens.

FENCING

A fence is a barrier of live or dead materials dividing two areas of land.

Importance of fencing in cattle.

- It controls movement of farm animals and protects them from enemies.
- Helps the farmer to isolate the sick animals from healthy ones.
- Enables mixed farming to be carried out on the same farm.
- Adds beauty to the farms and homes.
- It facilitates rotational grazing.
- It controls cattle and prevents cattle diseases.
- Natural fences can work as wind breaks.
- It helps a farmer to carry out selective breeding.

Disadvantages of fencing

- Thorny fences cause injury to animals.
- Fences can harbour snakes and animal pests like ticks.
- They are expensive to maintain.

Types of fences

- Planted or live fences.
- Wooden fences.
- Electric fences.
- Barbed and plain wire fences.
- Concrete block fences.
- Stone fences.

(a) Natural (planted) fences.

These are planted by man.

Examples of plants used.

- Conifers
- Sisal
- Thorny trees
- Bamboo

(b) Artificial (constructed) fences.

This is the type of fencing where the following materials are used:-

- Treated poles
- Bricks
- Barbed wires
- Wire nets
- Gates
- Chair links

Activity

1. State the requirements of a good cattle house
2. What is the importance of housing cattle?
3. What is a fence?
4. Why do people fence farm animals?

Evaluation

- Strength
- Weakness
- Strategy

GRAZING

This is the proper use of grass land by livestock.

Methods of grazing Animals.

- Rotational grazing.
- Zero grazing.
- Herding or free range system.

1. Rotational grazing

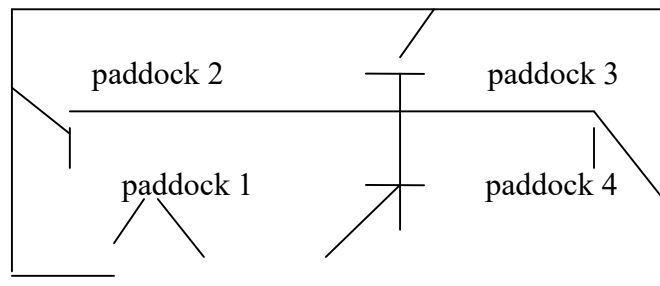
This is the type of grazing in which animals graze on one portion of pasture at a time.

Examples of Rotational grazing.

- Paddock grazing or paddocking.
- Strip grazing.
- Tethering.

(a) Paddock grazing or paddocking.

This is the grazing of animals on a divided piece of land using fences called paddocks. i.e



Advantages of paddock grazing.

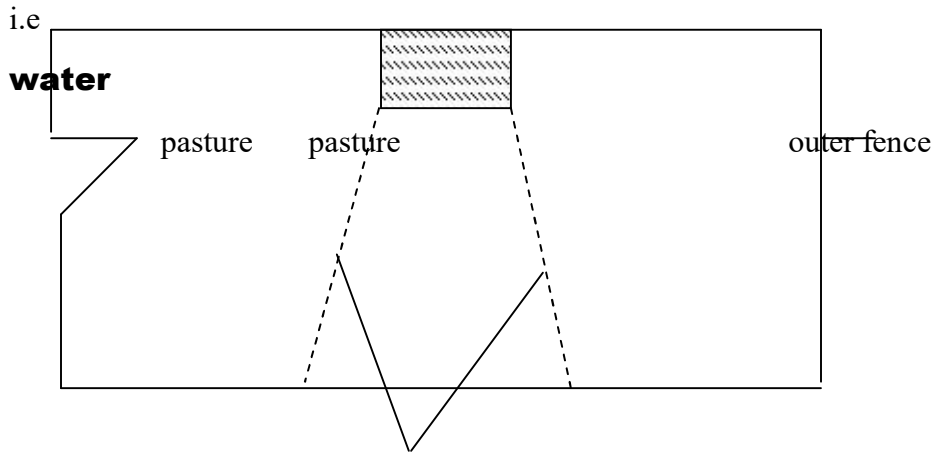
- It allows proper use of pasture.
- It gives a farmer time to do other activities.
- Manure is distributed evenly on the farm.
- It helps in the control of pests like ticks.
- The grass has time to grow.
- It helps to avoid overgrazing which leads to soil erosion.

Disadvantages of paddock grazing

- It is expensive to fence the paddocks.
- *It requires a large piece of land*
- Animals may not have enough room for exercises.

(b) Strip grazing

This is the type of grazing where pasture land is divided into very small portion called strips by a temporary wire to control movement of cattle in selected pasture area.



Temporary fence.

Advantages of strip grazing.

- Pasture is evenly used.
- Diseases and pests are easily controlled.
- Labour is reduced on the farm.

Disadvantages of strip grazing.

- It is very expensive to maintain.
- Few animals are kept.

(c) Tethering

This refers to tying of an animal to a peg or tree using a chain or rope to graze.

Advantages of tethering method of grazing.

- It is cheap method to maintain.
- No fence is needed.

Disadvantages of tethering.

- Animals lack enough exercises
- Few animals are kept.
- Animals may be restricted to one type of grass.
- Animals can easily get injuries by rope.

Activity

1. What is grazing?
2. Name any three methods of grazing
3. State the advantages of paddock system over tethering.

ZERO GRAZING

This is a system where cattle is kept in a specially constructed structure where feeds and water are provided.

In zero grazing, animals do not move or graze on pasture at all.

Cubicles are made for resting at night and have open space for little movement.

Requirements for zero grazing.

- A well constructed shade
- A feed trough

- Workers to feed animals and clean the stalls.
- A fodder garden
- Water trough
- Store
- A place for cleaning equipment
- Drainage ways to remove water and dung from the stall.
- Chaf cutter for cutting fodder into pieces.

Advantages of Zero grazing.

- Animals produce more milk and meat as they do not do a lot of work.
- Animals have less chances of getting diseases.
- Feeds are not wasted as animals are given just enough.
- It is easy to collect manure.
- It is easy to spot a sick animal.
- You can keep many animals on a small area.

Disadvantages of Zero grazing.

- It is expensive to start.
- Feeds must be grown or bought.
- More labour is required to feed the animals.
- It requires a lot of cleaning in the stalls.
- Animals lack enough exercises.
- In case one animal gets sick, the disease *can* easily spread to the rest of the animals.

HERDING.

This is a method where animals are looked after when they are grazing.

Advantages of herding.

- The animals are closely watched by the herdsman.
- The herdsman directs animals to good grass.
- Animals get enough exercises.

Disadvantages of herding

- The animals can easily get diseases as they graze.
- Animals may stray and destroy other people's crops.
- Animals are likely to overgraze or starve where land is small.

Activity

1. What is zero grazing?
2. Give two advantages of zero grazing?
3. What is herding?
4. Why is herding a bad method of grazing cattle?

METHODS OF CALF MANAGEMENT

- Numbering
- Dehorning or disbudding
- Castration
- Deworming
- Spraying and Dipping

- Removal of Extra Teats.

1. **Numbering**

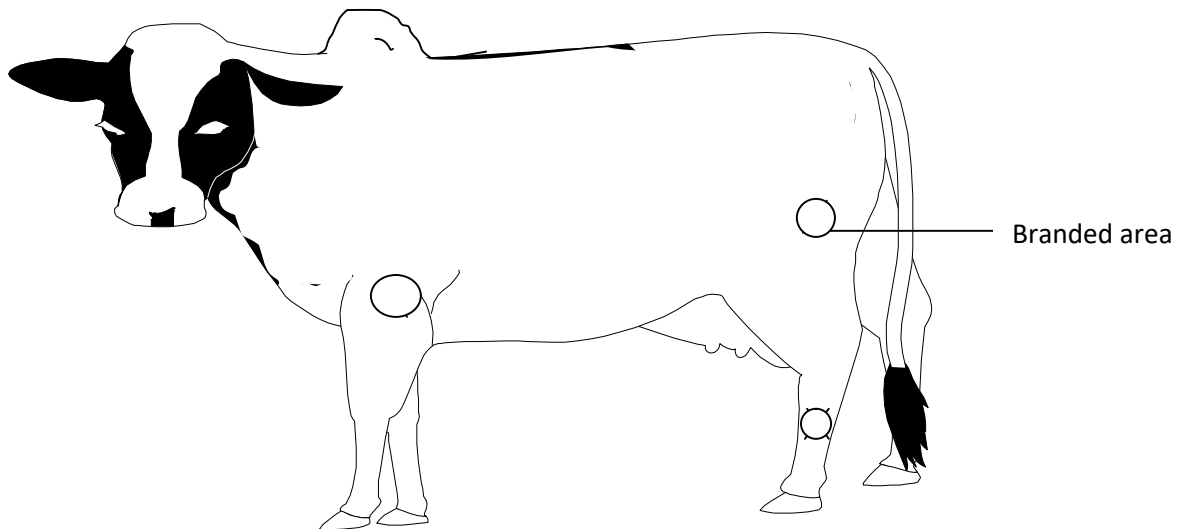
This is the putting of marks on animals for identification.

(a) **Branding**

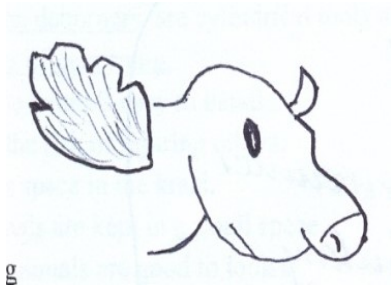
This is the use of a hot iron marked with a symbol to put a mark on animals for identification.

It should be done on only certain parts because it destroys the quantity of the hides.

i.e



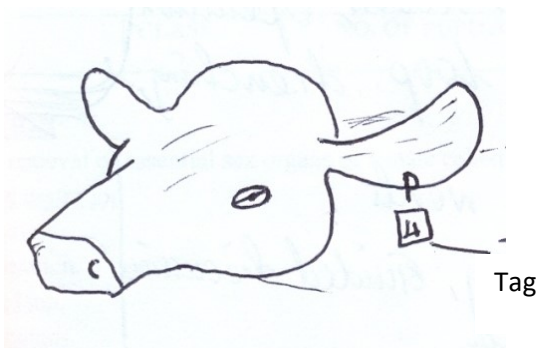
(b) **Ear notching** is the cutting of animal's ear with marks at the edges.



(c) **Ear tagging**

This is when a tags having number are fixed on the ear of the animals using an applicator.

i.e



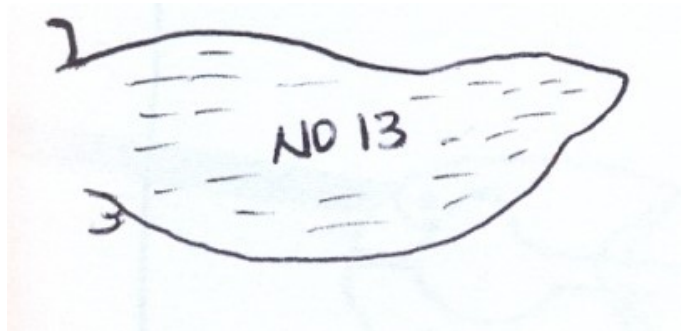
(d) **Number laces**

This is when a wooden or iron piece of plate is put on the animal's neck.

(e) **Ear tattooing**

This is the making of permanent marks up using pliers carrying a number of letter on the ear of an animal.

i.e



(f) **Tail bobbing** is the trimming of the long hair on the animal's tail (switch).

(2) **Dehorning or Disbudding** is the practice of removing horns buds from an animal's head.

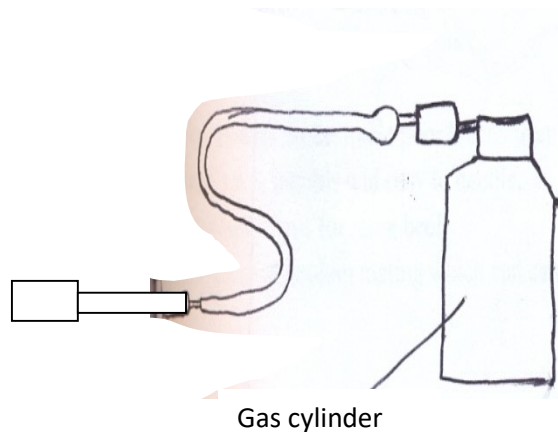
Methods of dehorning.

(a) **Using chemicals**

This is when a horn bud is rubbed with a caustic stick containing chemicals until it is about to bleed.

(b) Using dehorning iron is when a red hot iron is pressed on the outside of the horn bud for a short time.

The dehorning iron



Gas cylinder

(c) **Using spoon dehorners** are cylindrical tools used to scoop out horn buds when calves are about two months old.

Advantages of dehorning.

- It makes the animals easy to handle.
- It reduces the risk of injuring others.
- It increases space in the kraal.
- Many animals are kept in a small space.

- Dehorned animals are good to look at.

Activity

1. Write down any four methods of calf management.
2. Explain the following:-
 - a. Numbering
 - b. Branding
 - c. Ear notching
 - d. Ear tagging

3. CASTRATION

This is the removal of testes from male animals

Methods of castration

- Open operation.
- Closed operation.
- Use of the loop.

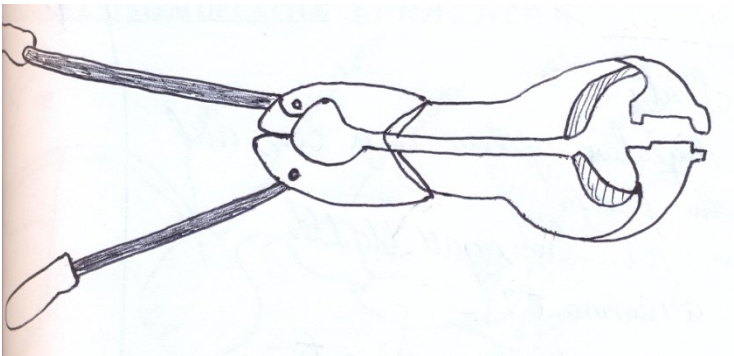
(a) Open operations.

Here a sharp knife is used to make a slit by cutting open the scrotum vertically. The testes are removed and a hot iron is used to burn and seal off the sperm duct.

(b) Closed operations.

Here an instrument called a burdizzo with blunt pincers is used with great pressure to crush the sperm duct.

The burdizzo



(c) Use of a loop.

An elastic rubber band is used to squeeze the testes, when the spermatic cord and the blood vessels are broken, the testis shrivel and die.

Reasons for castration.

- Castration prevents undesirable poor breeds from breeding.
- A castrated bull is humble and easy to handle.
- A castrated bull fattens for more beef.
- Castration prevents random mating which can cause unwanted pregnancies.

Disadvantages of castration.

- Wounds may become septic and cause pain to the animals.
- The animals may lose a lot of blood.
- It is very painful to animals
- Castrated animals are not allowed their natural right of reproducing.

4. Deworming

This is the practice of giving drugs to domestic animals and birds to remove internal parasites from their bodies.

Methods of deworming

- Drenching
- Dozing

Drenching is the giving of liquid medicine to cattle through the mouth.

Dozing is the giving of solid medicine to cattle through the mouth.

5. Spraying and dipping.

This is done to kill ecto parasites (external parasites) from their bodies using acaricides.

6. Removal of Extra Teats.

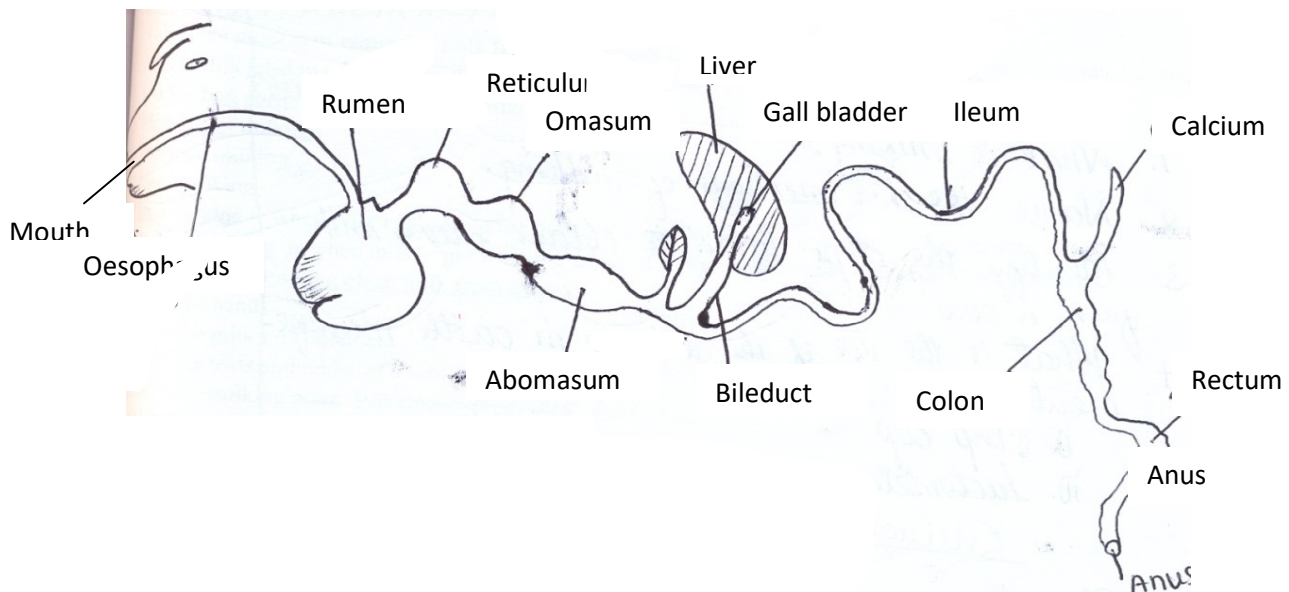
This is done to remove extra teats that grow in the udder.

There must be only four teats.

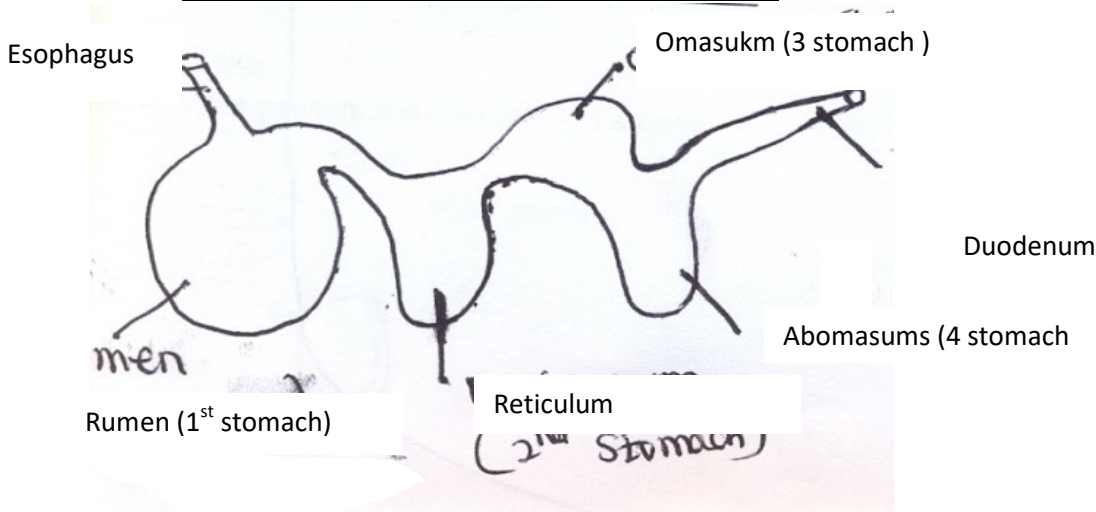
Activity

1. Define castration
2. Name the three methods of castration
3. Why do we castrate farm animals?
4. How can internal parasites be controlled?

DIGESTIVE SYSTEM OF CATTLE (PRACTICAL)



The four chambers of stomach of a ruminant



Functions of Each part.

- (a) **Esophagus** is a passage of food to the rumen.
- (b) **Mouth** is where food is chewed and moistened.
- (c) **Rumen (pouch)** stores food for some time.
- (d) **Reticulum (honey comb)** is where finely chewed food is separated from warse ones.
- (e) **Omasum** grinds food to make it more fine.
- (f) **Abomasums** is where food is acted upon using enzymes.
Abomasums is called a true stomach because it has enzymes.

Ruminants

These are animals that chew the cud.

Ruminants are called polygastrics because they have more than one stomach.

Examples of ruminants.

- Cattle
- Goats
- Sheep
- Antelope
- Kob

Activity

1. Draw a digestive system of a cow and indicate the parts.
 - a. Ruman
 - b. Reticulum
 - c. Gall bladder
2. What is a ruminant?
3. Give four examples of ruminants

MILKING (PRACTICAL)

The act of removing milk from animal under

NB (i) Milk let-down is the flow of milk from the udder of a cow.

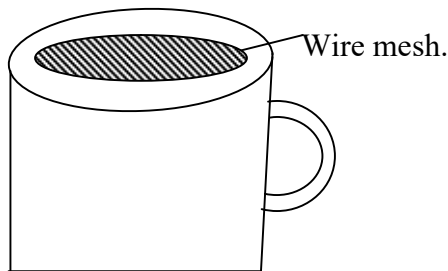
(ii) **Milking parlour** is a place where milking takes place.

Methods of milking.

- Machine milking
 - Hand milking
- (a) **Hand milking** is when milk is got from the udder of a cow by squeezing the teats using hands.
- (b) **Machine milking** is when milk is got from the udder of a cow by squeezing the teats using machines.

Conditions of obtaining clean milk from a cow.

- Wash the hands
 - Wash the milking containers
 - Wash the teats and udder of a cow with warm water.
 - Clean the milking parlour
 - Give the cow some feeds to eat during milking.
 - Milk down onto the floor the first drops of milk.
- (a) **The strip cup.**
It detects the presence of mastitis in a cow.



Signs of mastitis in a cow.

- Milk contains blood stains.
 - The udder and teats swells.
 - Animal rejects suckling its young one.
 - Infected udder stops giving milk.
- (b) **A lactometer**
- Detects the presence of water in milk.
 - Detects whether fats have been removed from milk.

Factors that affect milk production.

- Poor feeding
- Diseases
- Poor handling of cow during milking.
- Poor climate.
- Age of the cow.
- Poor methods of milking.

Methods of preserving milk.

- By pasteurization / keeping it safe by heating.
- Sterilization is boiling to kill bacteria.
- Refrigeration.
- Boiling.
- Refrigeration preserves milk by making germs dormant not to produce.

NOTE: Homogenising is the treating milk to break down the fats and cream to be mixed with the rest.

Activity

1. What is milking?
2. Name the two methods of milking.
3. Identify the steps taken to obtain clean milk from a cow.
4. What is the use of the following in cattle management
 - a. Strip cup
 - b. Lactometer

CATTLE PRODUCTS.

- Meat
- Milk
- Hides
- Blood
- Bones
- Hooves
- Horns
- Dung and urine

Milk products.

- Butter
- Cheese
- Yoghurt
- Ice cream
- Biscuits
- Casein
- Whey
- Cream

Hide products

- Bags
- Drums
- Belts
- Shoes
- Jackets
- Balls

Hoof / Horn products

- Buttons
- Necklaces

Farm records

These refer to written information on various activities carried out on the farm.

Types of farm records.

- Production records
- Breeding records
- Health records
- Labour records

- Marketing records

- Field records

Importance of farm records

- Help farmers to make decision on a farm.
- Farm records help farmers to work out the profits and losses on the farm.
- Farm records enable the government tax the farm fairly.

Activity

1. Name any four cattle products
2. What are farm records?
3. State any three types of farm records.
4. Why is it important to keep farm records (Give four)

CATTLE PESTS AND DISEASES

A **Cattle pest** are living organisms which attack cattle like parasites.

A parasite is a living organism which feeds on another living organism called host yet the host doesnot benefit.

Types of parasites

1. – External parasites (*Ecto parasities*). *These are parasities which attack the skin of an anima*

Examples of externals parasites.

- Ticks
- Tsetse flies
- Mites
- Fleas

Control of external parasites

- Spraying using Acaricides
- Dipping them in acaricides
- Hand picking for the case of ticks

2. **Internal parasites (Endo parasities)**

These live inside the body of the animal.

Examples of internal parasites.

- Tape worms
- Round worms
- Hook worms
- Liver flukes

Control of internal parasites

- Deworming *animals regularly*
- Grazing in drained pasture
- Treating water to kill snails.

Animals diseases

Causative agents of cattle diseases

- Bacteria
- Virus
- Protozoa

Signs of sickness in animals

- Animal becomes dull with rough hair on the body.
- Animal coughs and sneezes
- There is diarrhea
- Animal has difficulty in passing out waste matter.
- There is rise in body temperature and pulse rate.
- Animal losses appetite on food.

Causes of spread of diseases in animals

- Poor diet
- Poor sanitation (dirty food and conditions)
- Physical injuries
- Infection by micro-organisms

Signs of good health in animals

- Good appetite
- Eyes are clean and bright
- Animals walk steadily
- Nostrils are cold and wet.
- Ears are warm and alert
- Skin is smooth
- Urine and dung are passed out easily.

Bacterial cattle diseases.

- Anthrax
- Mastitis
- Calf scour
- Black quarter
- Pneumonia
- Foot rot
- Contagious bovine pleura – pneumonia

Viral cattle disease

- Rinder pest
- Foot and mouth disease

Protozoa cattle diseases

- Nagana or trypanosomiasis
- Heart water
- East coast fever
- Red water
- Tuberculosis

Practices which harm cattle

- *Beating the farm animals*
- *Castration*
- *Dehorning*
- *Leaving animals without shelter*

Other cattle disease

- Bloat (hoven)
- Bruce llosis
- Tetanus

- Milk fever

Tick borne cattle diseases

- East coast fever
- Heart water
- Red water.
- Anaplasmosis

Activity

1. What is a cattle pest?
2. Define as parasite.
3. Give two examples of the following
 - a. External parasites
 - b. Internal parasites
4. How can internal parasites be controlled in cattle management?

Practices which harm cat.

CATTLE

- ploughing
- dairy cattle
- beef cattle
- Friesian
- breed of cattle
- hybrids
- inbreeding
- insemination
- reproduce
- zygote
- testosterone
- implantation
- zygote
- incalf
- hay
- predators
- paddocking
- grazing
- castration
- deworming
- dehorning
- dipping
- tattooing
- tail bobbing
- branding
- burdizzo
- rumen
- reticulum
- omasum
- abomasums
- strip cup
- mastitis

- lactometer
- yoghurt
- acaricides
- anaplasmosis

RESOURCES IN THE ENVIRONMENT

A resource is a material used to satisfy *man's* needs. Anything that gives support, help or comfort to human life.

Examples of resources.

- Sun
- Soil
- Plants
- Animals
- Fossil fuels
- Air
- Minerals
- Rocks
- Water

Types of resources

(a) Renewable resources

These are resources *which can get used up and can naturally be replaced.*

e.g

- Plants
- Animals
- Soil

(b) Non-renewable resources

These are resources *which get used up and cannot be naturally replaced.*

e.g

- Minerals
- Oil
- Natural gas

(c) Categories

These are resources that can be used up.

e.g

- Minerals
- Oil
- Natural gas

Examples of recyclable resources

- Water
- Glass
- Polythene
- Rubber
- *plastic*
- *scrap metal*
- Sun
- Water
- Air

- Air
- Water
- Sun

Examples of non living things that are resources

- Soil
- Rocks
- Fossil fuels
- Minerals
- Sun
- Water

Uses of soil as a resource

- *Sand soil is used for building*
- *Clay soil is used for modeling*
- *Sand soil is used for making glass*
- *Soil is used for growing crops*
- *Soil is a Source of minerals*

Uses of rocks

- Helps in the formation of soil *through weathering*
- Used for building houses
- Used for construction of roads and bridges
- Helps to attract tourists

Activity

1. What is a resource?
2. Give three examples of resources.
3. Name any four types of resources
4. Explain why plants and animals are called renewable resources.

MINERALS

These are substances that occur naturally like a rock in the earth. Minerals are useful solids or liquid substances found underground.

Examples of minerals

- Oil, Clay, Chalk, Copper, Tin, Gold, Bauxite, Iron, Salt

Uses of minerals as a resource

- Iron is used for making axes, hoes, nails and iron bars.
- Gold is used in the making of earrings, watches and necklaces.
- Copper is used to make electric wires, bullets, coins and refrigerators.
- Aluminum is used to make tins, aeroplanes, roofing sheets and saucepans.
- Wolfram / tungsten for making filaments of bulbs.
- Mercury is used in thermometers.

Uses of the sun as a resource

- It helps our bodies to make vitamin D using the skin.
- Heat from the sun helps to dry our harvested crops.
- Sun provide sun light energy that helps in photosynthesis.
- Heat from the sun provides solar energy.

Uses of water as a resource

- Used in the production of Hydro-electricity
- For cooking
- For bathing
- For washing
- Water supports plant life and animal life too.
- Water cools engines *in factories and industries*

Uses of wind as a resource

- Wind runs wind mills.
- Wind helps in winnowing.
- Wind helps in the drying of our clothes, *by quickening the rate of evaporation*
- *For sailing boats*

Air

Air is a mixture of gases

Components of Air.

- Oxygen 21%
- Nitrogen 78%
- Rare gases 0.97% or 1%
- Carbondioxide 0.03%

Uses of oxygen

- For respiration
- Supports burning
- Used in the process of rusting

Uses of carbon dioxide.

- Used in fire extinguishers to put off fire.
- Used to preserve soft drinks *e.g. Sodas.*
- Used in the process of photosynthesis.

Uses of nitrogen.

- Used by plant to make proteins.
- Used in electric bulb to prevent evaporation of *argon*
- Used in manufacture of acids e.g nitric acid.

Examples of Rare gases.

- Argon, - Xenon, - Krypton, - Neon, - Helium

Activity

1. What is a mineral?
2. How are minerals useful as resources?
3. Give three ways in which wind and air are used as resources.

FOSSILS

These are the remains of plants and animals that buried *millions* of years ago.

Coal, petroleum, natural gas

ALLOYS

An alloy is a *uniform* mixture of two or more metals.

Purposes of making alloys.

- To make the metal harder.
- To lower the melting point of metal.
- To make the metal more resistant to corrosion ie wear and tear.
- To increase the electrical resistance of metals.

Examples of alloys

- (a) Brass = Copper + Zinc
- (b) Bronze = Copper + Tin
- (c) Dentist Amalgam = Mercury + Copper
- (d) Solder = Lead + Tin

Uses of alloys

- Brass and Bronze are used for making decorating ornaments.
- Brass is used to make wires, tubing cases for bullets.
- Bronze is used for making coins and medals, swords, statues
- Dentist Amalgam is used for dental filling of the teeth.
- Gold is used for making coins and dental caps.
- Solder is used for joining metals.

Resources

- resource
- renewable
- weathering
- fossils
- alloy
- corrosion
- dentist amalgam
- fuel
- jute
- synthetic

FUELS

A fuel is anything that burns to produce heat.

Examples of fuels

- Firewood(wood fuel)
- Oil
- Coal
- Charcoal

Uses of living things as resources

(d) Plants

- Source of food.
- Provides construction materials e.g wood.
- Timber is used for making furniture. Provide poles
- Provide shade.
- Source of medicine.
- For firewood.
- Source of bark cloth.

Examples of plant fibre.

- Sisal - *Jute*
- Cottonwool

Synthetic fibres

- *Polythene*
- *Nylon*
- *Polystyrene*

Conservation ways of resources

(e) Animals

- Source of food.
- Used for transport.
- Oxen can plough for man.
- Some animals like dogs provide security.

Examples of animal fibre.

- Wool *from sheep* - *Silk from silk worms*
- (mohair)

How people use resources

- To get food.
- For shelter.
- To get transport.
- To get money.
- To get fresh air and water.

Fibre	Source
Wool	Sheep
Mohair	Goats
Silk	Silk worms

How to conserve resources.

Conservation of resources means

Keeping resources in a good condition without destroying them. The protective use of resources

(a) Plants

- Control harvesting and set up strict restrictions on people who sell trees.
- Sensitizing people on the dangers of deforestation.
- Replace harvested plants.
- Use fuel saving equipments.
- Use electricity for cooking.

(b) Soil

- Mulching
- Crop rotation
- Applying manure
- Avoid over cultivation
- Deforestation

(c) Animals

- Avoid overstocking
- Provide good pasture
- Avoid over fishing
- Guard against poaching
- Vaccinate and treat sick animals.
- *Controlling bush fires*
- *Establishing game reserves*

(d) Minerals

- Mixing metals to form alloys
- Control mining
- Painting metals

- Recycling the recyclable scraps.

(e) **Water**

- Protect the wetlands or swamps
- Planting trees
- Protecting wells and springs.

Activity

1. What are fossils?
2. Explain the term an alloy.
3. Give two reasons for making alloys.
4. What is a fuel?
5. Explain any four uses of living things as resources.

THE RESPIRATORY SYSTEM

Respiration is the process by which oxygen breaks down food to produce energy,

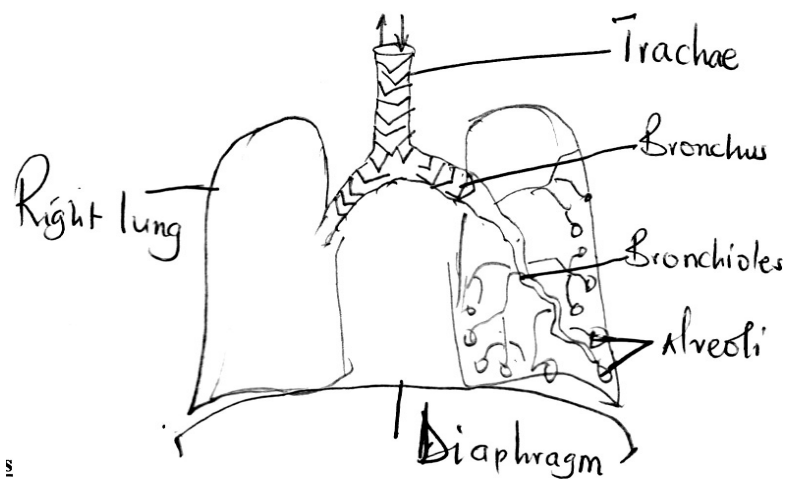
By- products of repiration

- Carbon dioxide
- Water vapour

Products of respiration

- *Energy*
- *Heat*

The human lung.



Functions of the lungs

- They carry out the exchange of gases. (*respiration*)
 - The excrete carbon dioxide and water vapour. (*excretion*)
- Therefore, lungs are both respiratory and excretory organs.*

Breathing

This is the act of taking in air into the lungs and out from the lungs.

Types of breathing

- Inspiration / *inhalation*
- Expiration / *Exhalation*

Inspiration

This is the taking in of into the lungs.

It is also called *inhalation*

During inspiration

- The diaphragm contracts (moves down wards/ flattens)
- The volume of lungs increases.
- The volume of chest increases.
- Ribs go upwards and outwards.

Activity

1. What is respiration?
2. Name two products of respiration.
3. Identify the bi-products of respiration.
4. What is the difference between respiration and breathing.

EXPIRATION

This is the taking out of air rich in carbon dioxide from the lungs.

During expiration

- Diaphragm relaxes (moves upwards/ becomes dome shaped)
- *Volume inside the chest reduces.*
- Volume of lungs reduces.
- Ribs go downwards and inwards

Air breathed in and out.

Air	percentage in	Percentage out
Oxygen	21%	16%
Nitrogen	78%	78%
Carbon dioxide	0.03%	4%
Rare gases	0.97%	0.97%
Water vapour	Less	More

- *Air **breathed** out* contains less oxygen than air ***breathed** in* because oxygen has been use by the body.
- Air ***breathed** out* contains more carbon dioxide than air***breathed** in* because carbon dioxide is given out by the body.
- The same amount of nitrogen is breathed in and out because the body does not use any nitrogen in it.

THE NOSE

It contains small hair called cilia which traps dust and germs from the air entering the body.

Why it is good to breathe through the nose.

Air in the nose is filtered, moistened and warmed before entering the wind pipe to avoid chilling of the lungs.

Why it is not advised to breathe through the mouth.

- Air entering the body will not be warmed and will chill the person.
- Dust and germs will not be filtered.

Amodel lung (Practical)

The trachea.

- It allows air to enter the lungs.
- The trachea is made up of rings of cartilage to keep it open all the time and avoid collapsing causing suffocating.
- It contains cilia which traps dust and germs.
- Trachea contains mucus which traps germs and dust in air.

The air sacs

This is where exchange of gases take place.

Diagram of air sac

NOTE:

- Exchange of gases take place in air sacs by the process of diffusion.
- Diffusion is the movement of molecules from areas of a high concentration to areas of low concentration. .

Adaptations of air sacs to exchange of gases.

- They are many in number to increase surface area for gaseous exchange.
- Have a net work of blood capillaries to bring out carbondioxide and take in oxygen
- Have thin membranes to allow diffusion of gases.

NOTE:

- The pleural membranes secrete pleural fluid to lubricate and reduce friction between ribs and lungs.
- The rib cage protects the lungs and heart *from the damage*
- The lungs are connected to the circulatory system because it helps in gaseous exchange.

Activity

1. What is expiration?
2. Explain four things that happen during expiration.
3. Identify any two adaptations of air sacs to exchange of gases.

Evaluation

- Strength
- Weakness
- Strategy

A model lung.

When we breathe in, the balloons expand and rubber is forced downwards. When air is breathed out, the balloons reduce in size and the rubber moves upwards.

Lung diseases caused by bacteria

- Tuberculosis
- Whooping cough
- Diphtheria
- Pneumonia

Lung diseases caused by virus.

- Influenza
- Flue
- Pneumonia

Lung diseases caused by smoking

- Lung cancer
- Bronchitis
- Emphysema

Allergic diseases of the lungs.

- Asthma

How to maintain the proper functioning of the lungs.

- Avoid smoking
- Eat meals rich in a balanced diet.
- Doing regular physical exercises.
- Immunization at early ages.

Activity

1. State the use of cilia found in the nostrils.
2. Name three things that happen to air in the nose.
3. How can you keep your respiratory system so that it functions well? (Give four)

WORD BANK

Classification of plants

spores	liverworts	conifers
chlorophyll	algae	bear
photosynthesis	masses	reproduce
starch	lichens	dicotyledonous
monocotyledonous	buttress	adventitious
rhizomes	mineral salts	propagation
bud	inter-nodes	rhizomes
scale leaves	clasping	twining
auxiliary	terminal	cucumber
b	shading	stomata
petiole	scatter	pericarp
ovary	dehiscent	indehiscent
receptacle	scent	juicy
dispersal	mesocarp	vegetative
brightly coloured	grafting	marcotting
propagation		

Cattle keeping

dual purpose	indigenous	conception
local	in-breeding	pasture
exotic	insemination	succulent
hind	silage	lactating

hay
gestation
weaning
castration
durdizo

steaming up
fertilization
notching
dozing

colostrums
calving
bobbing
strip

Resources

minerals
fossils
petroleum
expiration

coal
copper
solar
air sacs
bronchioles

diffusion
alveoli
inspiration
trachea