PRIMARY FOUR SCIENCE TOPICAL BREAKDOWN – TERM I 2023

THEMES

1. The world of living things
2. Our environment
3. Human health
4. Human body

THEME 1: The world of living things

TOPIC 1: Plant life

- Parts of a flowering plant
- Functions of each part of a flowering plant
- Uses of plants to people and other animals
- Dangers of plants in the environment

Main parts of a flowering plant

- Roots (types, examples and uses)
- Stems (types, examples and uses)
- Leaves (photosynthesis, transpiration)
- Flowers (pollination)
- Seeds (groups of seeds and germination)

TOPIC 2: Crop growing

- Common crops
- Groups of crops
- Garden tools/ equipment/ materials
- Crop growing practices
- Crop pests and diseases
- Ways of controlling crop pests and diseases

THEME 2: Our environment

TOPIC 3: Weather changes

- Elements of weather

- States of weather
- Activities done in each type of weather
- Water cycle

Rain (Rain clouds, uses of rain and effects of rain)

- Weather chart
- Main weather instruments (Rain gauge and thermometers)

THEME 3: Human health

TOPIC 4: Personal hygiene

- Importance of personal hygiene
- Ways of keeping the body clean
- Things used to keep the body clean
- Keeping clothes and beddings clean
- Reasons for keeping the clothes and beddings clean
- Dangers of poor personal hygiene

TOPIC 5: <u>Our food</u>

- Sources of food
- Places where food is obtained
- Ways of obtaining food (food path)
- Reasons why we eat food
- Importance of food in the body

<u>A balanced diet</u>

- Classes of food
- Deficiency diseases
- Signs and symptoms of each diseases
- Food preparation and preservation
- Food contamination and hygiene

THEME 4: Human body

TOPIC 6: Human body organs

PRIMARY FOUR SCIENCE LESSON NOTES

THEMES: The world of living things

TOPIC 1: Plant life

A plant is a living thing that makes its food

Plants are one of the main groups of living things

Differences between plants and animals

Plants	Animals
Plants make their food	Animals do not make their food
Plants have chlorophyll	Animals do not have chlorophyll
Plants have limited movement	Animals move freely

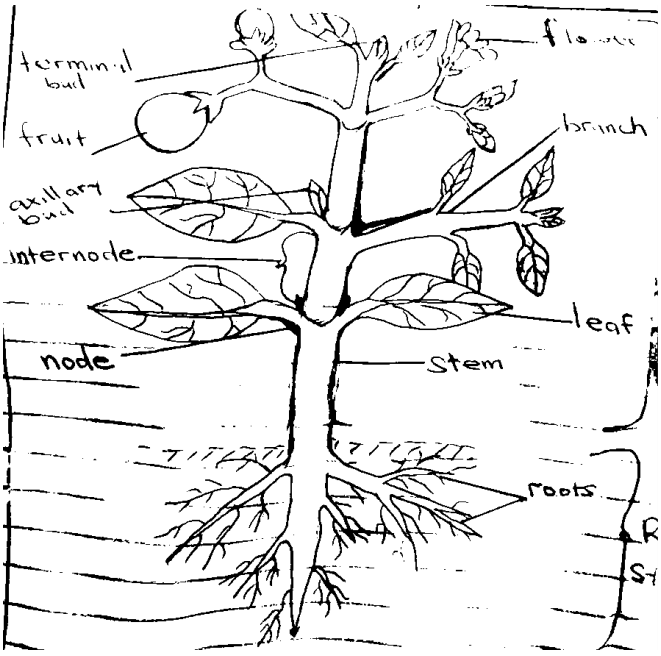
Flowering plants

- Flowering plants are plants which bear flowers
- Flowering plants reproduce by means of seeds

Examples of flowering plants

- Beans
- Maize
- Mangoes
- Orange
- Cotton
- Cassava
- Banana
- Acacia
- etc

Parts of a flowering plant



Functions of each part

Terminal bud. Is the growing tip of a plant i.e it promotes continuous growth of a plant.

Axillary/lateral/sidebud

- grows into a branch
- it also grows into a flower

Node:

- attaches a leaf stalk to stem or branch of a plant.

Internode:

- is a distance between two nodes
- it stores food in some plants like sugarcane

stem

- holds branches and leaves upright

leaves

- make food for a plant

roots

- hold plants in the soil

Questions

1. Identify the group of living things that make their food.
2. Which part of a plant develops into a side branch?
3. In which way do plants benefit from leaves?
4. How do flowering plants reproduce?
5. Give a reason why bean plants are grouped as flowering plants.

Importance of plants to people and to animals

- Some plants provide herbal medicine to animals
- Plants provide shade to animals
- Plants provide oxygen to animals

Dangers of plants in the environment

- Some plants are poisonous when eaten
- Some plants have thorns which pierce animals
- Plants are habitats for dangerous animals
- Shades of plants scare people at night
- Some plants smell badly e.g skunk cabbage, corpse flower etc

How plants depend on animals

- Animals provide carbon dioxide to plants
- Animals provide manure to plants
- Animals provide care to plants

How plants depend on other plants

- Some plants provide support to other plants
- Some plants get shade from other plants
- Some plants provide protection to others in the garden e.g sisal, cactus
- Legumes provide nutrients to soil for other plants

Systems of a flowering plant

- A flowering plant consists of two systems, namely
  Shoot system
  Root system

Shoot system

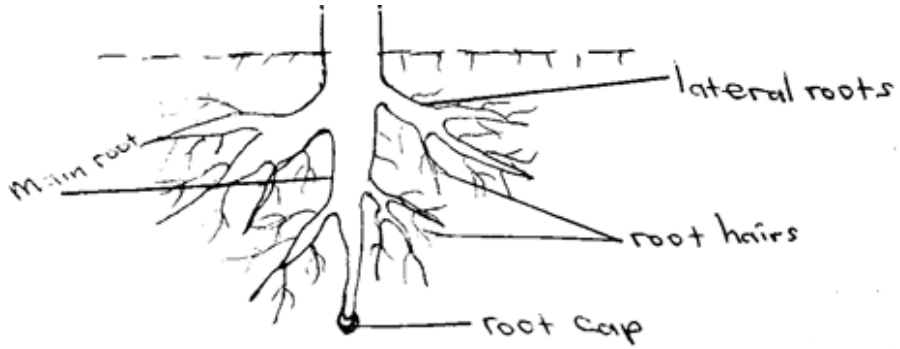
This is the part of a plant that grows above the ground

- It develops from a plumule of a seed embryo
- It consists of the following parts i.e
  a) Terminal bud
  b) Leaves
  c) Branches
  d) Flowers
  e) Fruits
  f) Axillary bud/side bud/lateral bud
  g) Stem

Root system

- This is the part of a plant that grows in the soil
- It develops from a radicle of a seed embryo
- Root system consists of the following parts i.e
  a) Lateral roots
  b) Root cap
  c) Root hairs
  d) Main/tap root

Parts of a root system



Uses of each part

Main root

- It supports the plant firmly in the soil

Lateral roots

They give extra support to the plant

Root hairs

- They absorb water and mineral salts from the soil through osmosis

Root cap

It protects the main root from damage

Questions

1. state two ways animals depend on plants.
2. Name two main parts of the shoot system
3. Of what importance are root hairs to plants?
4. Identify the part of a seed embryo which develops into;
   i. Root system
   ii. Shoot system
5. Which part of a shoot system makes food for the plant?

Types of root system

- Tap root system
- Fibrous root system

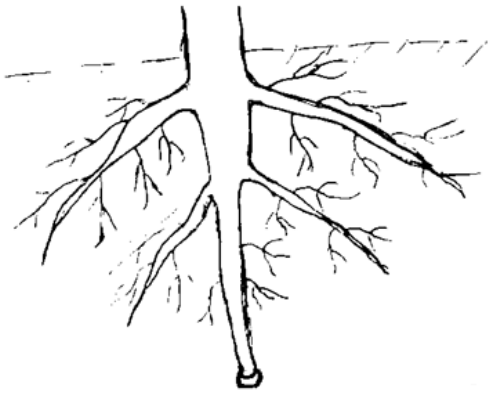
a) Tap root system
   This is a root system with the main root called tap root
   It is commonly found in dicotyledonous plants

Examples of plants with tap root system

- Mangoes
- Coffee
- Beans

- Oranges
- Groundnuts
- Jackfruit
- Soyabeans etc

Structure of a tap root system

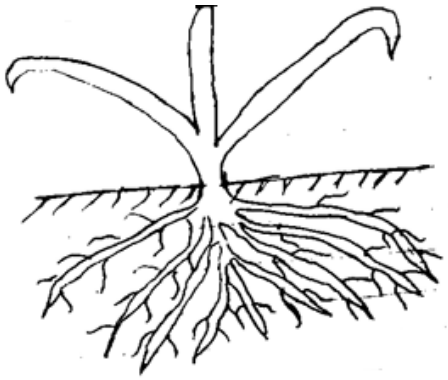


b) Fibrous root system
   - This is a root system where roots grow randomly of the same size
   - It does not have a main root
   - It is commonly found in monocotyledonous plants

Examples of plants with fibrous root system

- Maize
- Rice
- Barley
- Millet
- Sorghum
- Wheat
- Sugarcane
- Oats
- Coach grass
- Banana
- Yam etc

Structure of a fibrous root system



Fibrous root system

c) Adventitious roots

These are roots that develop from other parts of a plant

Examples of adventitious roots

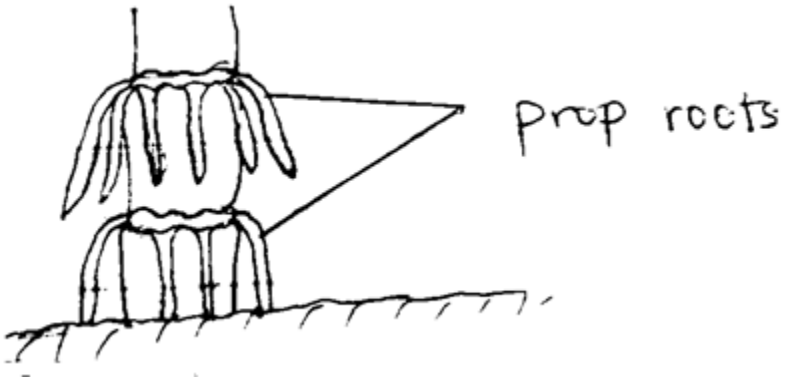
- Prop roots
- Breathing roots
- Stilt roots
- Buttress roots
- Clasping roots
- Storage roots

NB: All adventitious roots provide extra support to plants

Examples of plants that develop prop roots

- Maize plants
- Rice plants
- Millet plants
- Sorghum plants
- Sugarcane plants etc

Structure of prop roots



Uses of roots to plants

- Roots hold the plants in the soil
- Roots absorb water and mineral salts from the soil
- Some roots store food for the plants

Uses of roots to people

- Some roots are eaten as food e.g cassava, carrots, turnips etc
- Some roots are used as herbal medicine
- Dry roots are used as firewood

Questions

1. Name and draw the two types of root systems
2. How are prop roots important to a maize plant?
3. Give two examples of plants with tap roots
4. Identify any two plants whose roots are eaten by man
5. Which root system do we find in monocotyledonous plants

STEMS

Uses of stems to plants

- They hold the leaves, branches and flowers upright

- Some stems store food for plants eg sugarcane, maize, irish potatoes etc
- They conduct water and mineral salts from roots to the leaves
- They transport starch from the leaves to the roots
- Some stems are used for propagation eg cassava, sugarcane etc
- Some stems make food for the plants eg cactus

Uses of stems to man

- Some stems are eaten as food eg irish potatoes, sugarcane etc
- Some stems are used as herbal medicine
- Dry stems are used as firewood
- They provide timber for building houses
- Some stems are used as electric poles

Types of stems

1. Upright stems
2. Storage/underground stems
3. Weak/climbing stems

Upright stems

These are stems which grow straight in the space e.g

- Mvule
- Eucalyptus
- Maize
- Sugarcane
- Lemon
- Avocado
- Mangoes
- Beans etc

Storage/underground stems

These are stems that grow under the ground

They are called storage stems because they store food in the underground stem

Examples of underground stems

- Irish potatoes
- White yams
- Garlic
- Onions
- Ginger
- Crocus
- Turmeric
- Zoysia
- Cocoyam
- Gladiolus

Questions

1. Identify any two plants that store food in the stems
2. How are plant stems useful to the builders?
3. Name any two types of stems
4. State one difference between a sugarcane and an irish potato
5. Give two examples of plants whose stems are used for propagation
6. In which way do plants benefit from stems?

Weak/climbing stems

These are stems that cannot support themselves upright

Reasons why plants with weak stems climb others

- To get extra support
- To get enough sunlight

Ways plants with weak stems climb others

1. By use of tendrils eg
   Pumpkins
   Cucumber
   Passion fruits
   Peas
   Watermelons

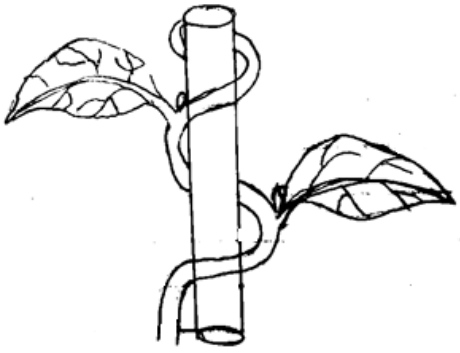
Loofah plant

Structure of a plant with tendrils

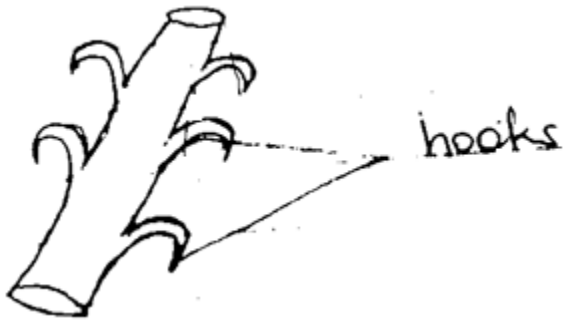
Note; tendrils help plants with weak stems to climb others

2. By clasping or twining eg
- White yams
- Morning glory
- Vanilla
- Beans

Structure



3. By use of hooks or thorns



Questions

1. Mention any two ways plants with weak stems climb others
2. How useful are tendrils to plants?
3. Give two reasons why plants with weak stems climb others
4. Write down one plant that limb others using clasps or twines
5. By what method do pumpkins climb their plants?

LEAVES

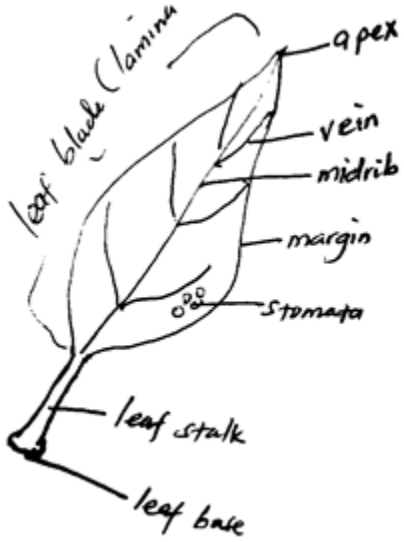
Uses of leaves to plants

- They make food for the plants
- Some leaves store food for the plants e.g cabbages, dodo etc
- Some leaves are used for propagation e.g bryophyllum
- They help plants to breathe
- It is where transpiration takes place

Uses of leaves to man

- Some leaves are eaten as food
- Some leaves are used as herbal medicine
- Some leaves are used to thatch houses
- Dry leaves are used as mulches in the garden
- Some leaves are used as animal feeds
- Some leaves are used as craft material

A structure of a leaf



Function of each part

1. Leaf blade (Lamina)
- It is where photosynthesis takes place
2. Stomata
- Used for breathing
3. Leaf stalk
- Holds the leaf on a plant
4. Leaf base
- Attaches the leaf on the stem of a plant
5. Veins
- Transport water and starch to other parts of a leaf

Types of leaves

Simple leaves

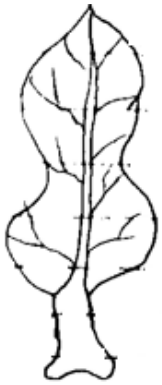
Compound leaves

Simple leaves

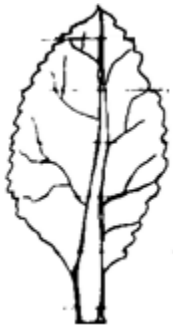
These are leaves with one leaflet on a leaf stalk

Examples of simple leaves

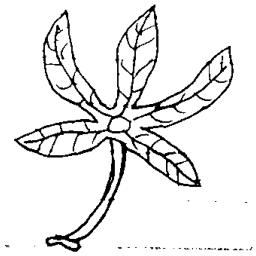
(1) Simple lobed leaf e.g pumpkin leaf



(2) Simple serrated e.g black jack



(3) Simple palmate leaf e.g pawpaw leaf, cassava leaf



(4) Simple divided entire e.g passion fruit leaf

Questions

1. State the main function of leaves to plants
2. How are stomata important to plants?
3. On which part of a leaf is starch made from?
4. Identify any two ways man can make use of plant leaves

5. Write one plant whose leaves are used for propagation

<u>Compound leaves</u>

These are leaves that have many leaflets on a leaf stalk

Examples of compound leaves

(1) Compound pinnate leaf e.g shame plant (touch me not plant), cassia leaf

(2) Compound bipinnate leaf e.g Acacia leaf

(3) Compound trifoliate e.g bean plant leaf, soya bean leaf, cowpea leaf

(4) Compound digitate e.g silk cotton

LEAF VENATION

This is the arrangement of veins in a leaf

Types of leaf venation

- Parallel leaf venation
- Reticulate leaf venation

Parallel leaf venation

This is where veins move from the apex to the leaf stalk without crossing one another

Examples of plants that haver parallel leaf venation

- Maize plants
- Millet plants
- Wheat plants
- Oats
- Sorghum plants
- Sugarcane plants
- Sisal plants
- Palm tree etc

Structure using a parallel leaf venated leaf

(2) Reticulate leaf venation

This is where veins cross one another to form nets

Note: It is common n dicotyledonous plants e.g

- Bean plants
- Groundnuts
- Soyabeans
- Cowpea plants
- Orange plants
- Lemon plants
- Avocado plants
- Mango plants

Structure using a reticulate venated leaf

Questions

1. Name any one type of leaves
2. Identify any two examples of plants with reticulate leaf venation
3. Name the compound leaf below

4. Write down one type of leaf venation
5. Give one example of a simple palmate leaf

Processes involved in plant leaves

- Photosynthesis
- Transpiration

Photosynthesis

- Photosynthesis is a process by which plants make their food called starch
- It takes place during day time. Why? Presence of sunlight
- It takes place in plant leaves in the part called leaf blade (lamina)

Requirements needed for photosynthesis

- Sunlight
- Chlorophyll
- Water
- Carbondioxide

Conditions necessary for photosynthesis

- Sunlight
- Chlorophyll

Roles played by the following during photosynthesis

a) Sunlight
   It provides energy
b) chlorophyll

   it traps sunlight during photosynthesis

Raw materials needed by plants during photosynthesis

- water
- carbon dioxide

Note: Both are used as raw materials

Importance of photosynthesis to plants

It provides food to plants

How do animals benefit from photosynthesis

- it provides oxygen to animals
- it provides food to animals

Importance of photosynthesis to the atmosphere

- it purifies (cleans) air
- by-products for photosynthesis

Main product of photosynthesis

- starch
- by-product of photosynthesis
- oxygen

Questions

1. Briefly explain the term photosynthesis
2. Which gas is given off during photosynthesis by plants?
3. What is the main product of photosynthesis
4. State the importance of chlorophil to plants during photosynthesis
5. Name the condition that speeds up the process of photosynthesis

Transpiration

- This is the process by which plants lose water inform of water vapour to the atmosphere
- It takes place in plant leaves through the stomata

Factors that affect the rate of transpiration

- Temperature
- Speed of wind
- Water supply in the soil
- Number of stomata in a leaf
- Light intensity (sunlight)
- Size of a leaf
- Humidity
- Number of leaves on a plant

Ways plants can reduce on the rate of transpiration

- By shedding leaves
- By folding leaves
- By producing a layer of wax to cover stomata
- By producing thorns instead of leaves eg cactus
- By growing needle shaped leaves e.g pine

Importance of transpiration to plants

- It cools plants
- It helps plants to absorb more water and mineral salts from the soil

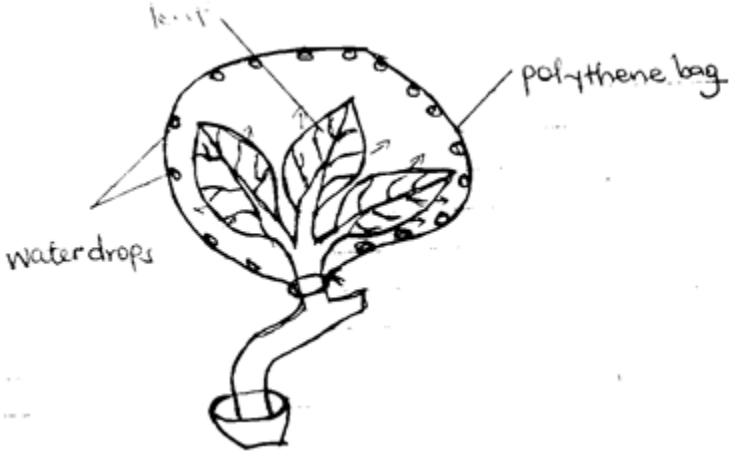
Importance of transpiration to environment

- It cools the environment
- It helps in rain formation

Dangers of transpiration to plants

It leads to wilting of plants

An experiment to show transpiration in plants



Importance of a transparent polythene bag

It helps to see the water drops easily

Use of a polythene bag during transpiration

It traps vapour from leaves

Questions

1. What is transpiration
2. Mention any two factors which affect the rate of transpiration
3. State one reason why some plants shed their leaves during dry season
4. Of what importance is transpiration to the environment
5. Mention one way plants can reduce on the rat of transpiration

Flowers

A flower is a reproductive part of a plant

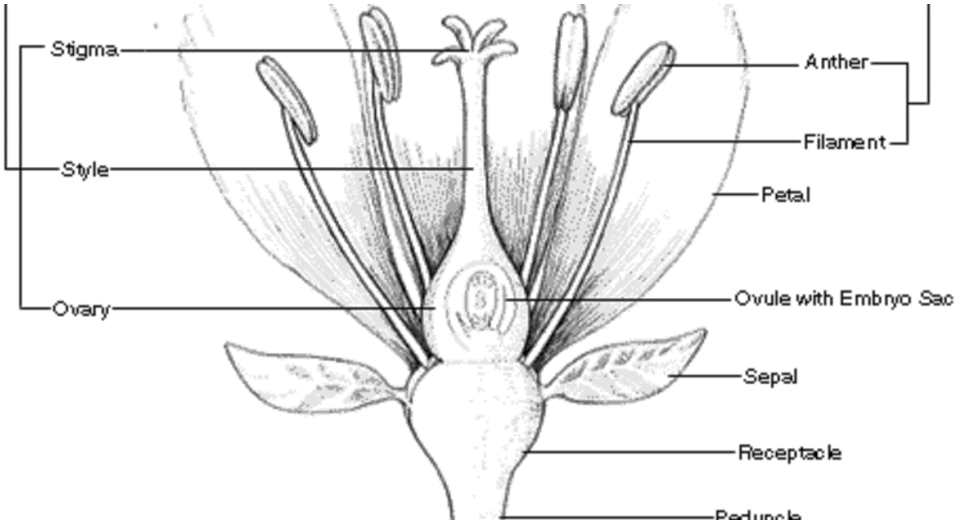
Importance of flowers to plants

- They help plants to produce seeds
- Some flowers store food e.g cauli flowers and broccoli flowers

Importance of flowers to people

- Some flowers are used for decoration
- Some flowers are eaten as food e.g pumpkin, cauli flowers, broccoli
- Some flowers are used as herbal medicine
- Some flowers are used to make colours
- Some flowers are used to make perfumes
- Some flowers are used as gifts to show love
- Some flowers are used as wreath

Parts of a flower



Functions of each part

Petal

- Protects the inner parts of a flower
- Bright coloured petals attract pollinators
- A group of petals is called corolla

Anthers

- They produce pollen grains (male reproductive cells)
- They store pollen grains

Stigma

- It receives pollen during pollination

Ovary

- It produces and stores ovules
- It develops into a fruit after fertilization
- It is where fertilization takes place

Ovules

- They develop into seeds after fertilization
- Ovules are the female reproductive cells

Style

- It holds the stigma in position

Filament

- It holds the anthers in position

Sepals

- They protect the flower at bud (young) stage
- The group of sepals is called calyx

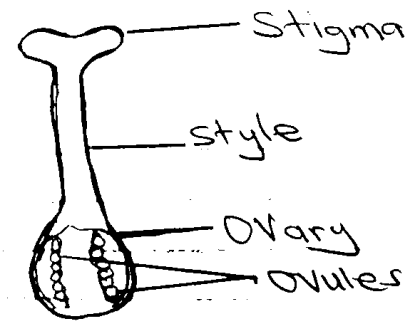
Reproductive parts of a flower

- Pistil
- Stamen

Pistil

A pistil is a female reproductive part of a flower

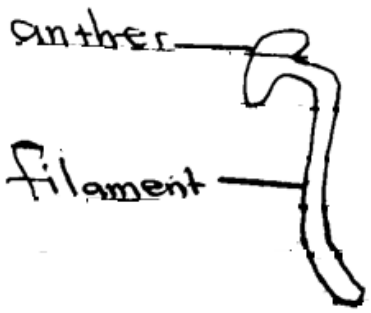
Parts of a pistil



Stamen

A stamen is a male reproductive part of a flower

Parts of a stamen



Questions

1. Apart from protection, give any other function of sepals to a flower
2. Mention any two ways flowers are important to people
3. What name is given to the female part of a flower?
4. State the importance of anthers to a plant
5. Why do some flowers have brightly coloured petals?

Pollination

- Pollination is the transfer of pollen from the anther to the stigma of a flower
- It takes place on a flower of a plant

Agents of pollination

- Wind
- Insects

- Flowing water
- animals

Insect pollinated flowers

These are flowers pollinated by insects e.g bees, butterflies, moths, beetles

Characteristics of insect pollinated flowers

- they have brightly coloured petals
- they produce nectar
- they are large and seen easily
- they produce scent
- they have a wide sticky stigma

Wind pollinated flowers

Thees are flowers pollinated by wind

Characteristics of wind pollinated flowers

- They have dull coloured petals
- They produce light pollen
- They do not produce nectar
- They do not produce scent
- They produce a lot of pollen

Note: Animals that help in pollination include; man, sunbirds, humming birds

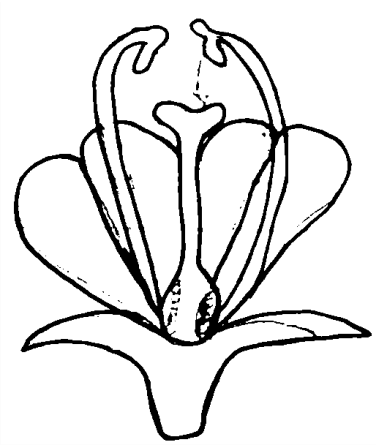
Types of pollination

- Self pollination
- Cross pollination

Self pollination

This is the transfer of pollen from the anther to the stigma of the same flower

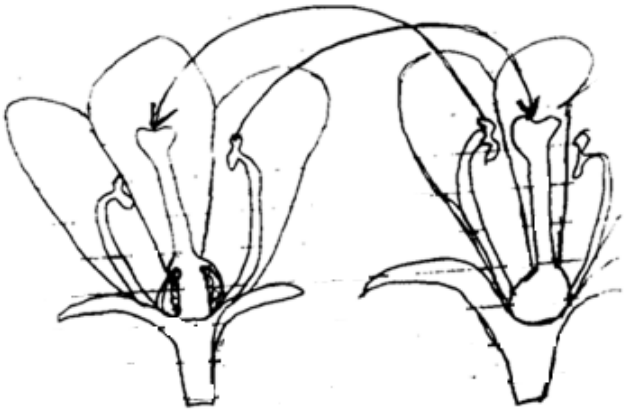
Structure of a self pollinated flower



Cross pollination

This the transfer of pollen from the anther to stigma of different flowers but of the same kind

Structure of cross pollinated flowers



Importance of pollination

- It helps plants to produce seeds
- It allows fertlization to take place

Questions

1. What is pollination
2. How is pollination important to plants?
3. State any two agents of pollination
4. Give one way plants benefit from butterflies
5. Mention one example of bird that pollinates flowers

Fertilization

This is the union of pollen and ovules to form seeds

OR

Fertilization is the union of female and male gametes to form a zygote

A gamete is a reproductive cell ie in plants, the male gamete is pollen and the female gamete is an ovule.

It takes place in the ovary of the flower

After fertilization, the ovary develops into a fruit and ovules develops into seeds. Other parts dry and fall off.

Seeds

A Seed is a mature fertilized ovule

Examples of seeds

- Beans
- Soya beans
- Cowpeas
- Pumpkin seeds
- Jackfruit seeds
- tomato seeds
- groundnuts
- French beans
- avocado seeds

etc

Types of seeds

- Dicotyledonous seeds (dicots)
- Monocotyledonous seeds (monocots)

Monocotyledonous seeds

These are seeds which have one cotyledon each

Monocotyledonous seeds are also called grains

Examples of monocotyledonous seeds

- Maize grains
- Rice grains
- Wheat
- Barley etc
- oats
- millet
- sorghum

Characteristics of monocotyledonous seeds or grains

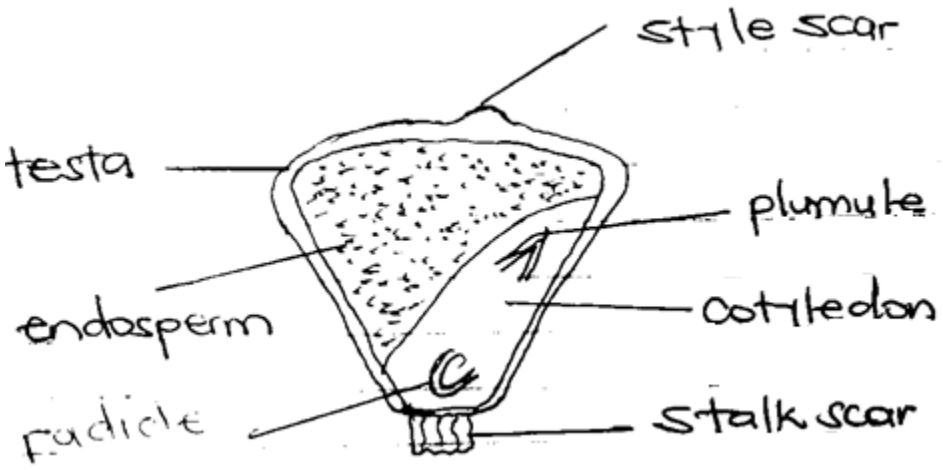
- They have one cotyledon each
- They undergo hypogeal germination

A maize grain

A maize grain is called a fruit not a seed. Why?

It has two scars i.e stalk and style scar

A structure of a maize grain



Questions

1. Where does fertilization take place in a flower?
2. Stat one reason why a maize grain is called a fruit
3. What happens to these parts of a flower after fertilization?
   (i) Ovary
   (ii) Ovules
4. How many cotyledons do monocot seeds have?
5. Mention one example of monocotyledonous seeds

Functions of the parts of a maize grain

(1) TESTA
Protects the inner parts of a maize grain

(2) Endosperm
Stores food for the grain

(3) Cotyledon
Provides food for the grain

(4) Plumule
Grows into a shoot system

(5) Radicle
Grows into a root system

(6) Stalk scar
Attaches the grain on the cob

(7) Dicotyledonous seeds
These are seeds that have two cotyledons each
Examples of dicotyledonous seeds

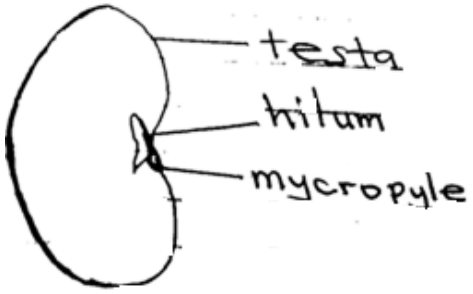
- Beans - French beans
- Groundnuts
- Soyabeans

Characteristics of dicotyledonous seeds

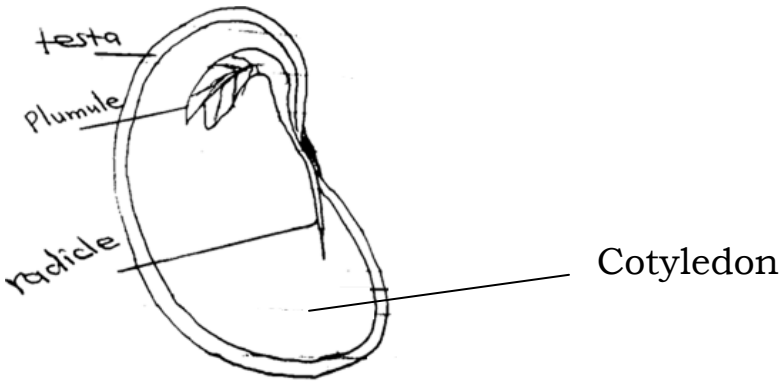
- They have two cotyledons each
- They undergo epigeal germination

A bean seed

External parts of a bean seed



Internal parts of a bean seed



Functions of each part of a bean seed

Testa

- Protects the inner parts of a seed

Cotyledon

- Stores and provides food for the embryo

Radicle

- Grows into a root system

Micropyle

- It allows in water and air during germination

Plumule

- Grows into a shoot system

Question

1. How is the cotyledon of a maize gran different from that of a bean seed?
2. Which part of a seed allows water in during germination?
3. Identify the part of a seed that develops into;
   (i) Roots
   (ii) Shoot system
4. In which way is the endosperm of a maize grain similar to the cotyledon of a bean seed?

SEED GERMINATION

- Seed germination is the development of a seed embryo into a seedling
  OR
- Seed germination is the growing of a seed embryo into a seedling

Seedling

A seedling is a young plant grown from a seed

Conditions necessary for seed germination

- Water (moisture)
- Oxygen

- Warmth

Roles of each condition for seed germination

Water

- Softens the seed testa to enable the embryo to come out

Oxygen

- It enables respiration to take place within the seed

Warmth

- It provides right temperatures needed for development of the seed embryo

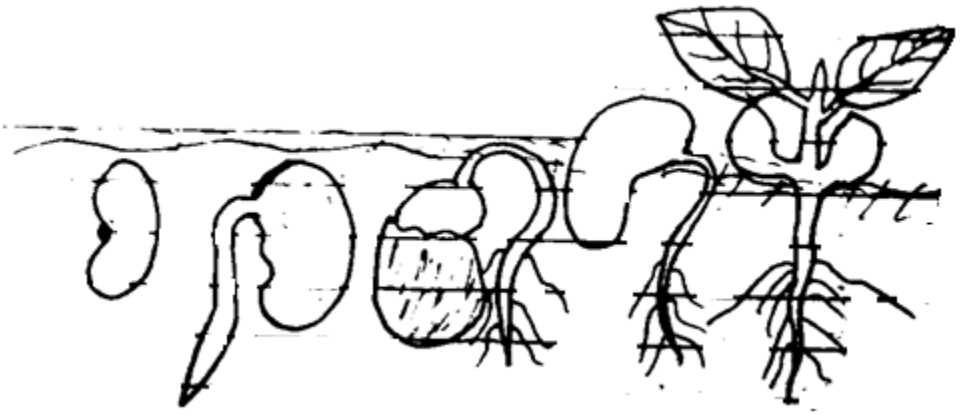
Types of seed germination

- Epigeal germination
- Hypogeal germination

Epigeal germination

- Epigeal germination is where a cotyledon of a germinating seed comes out of the soil
- This type of germination is commonly seen in dicotyledonous seeds like; beans, soya beans, groundnuts, mangoes, coffee etc

An illustration showing the stages involved in epigeal germination

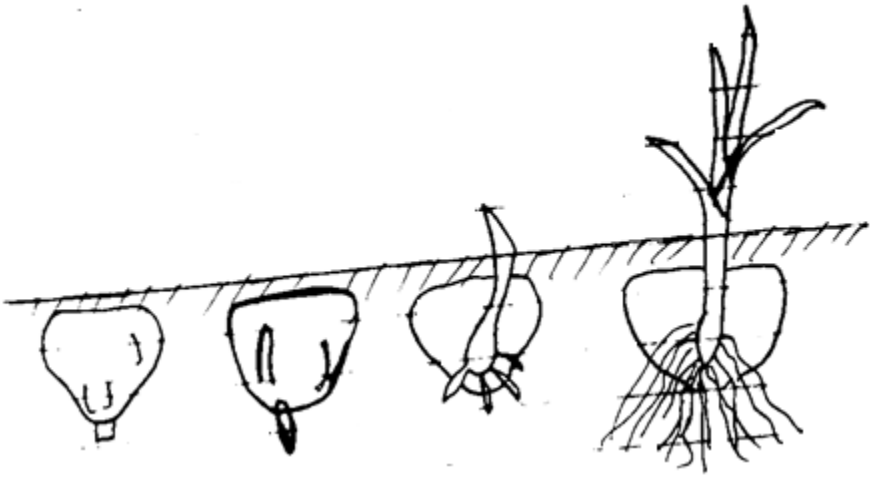


Hypogeal germination

- Hypogeal germination is where the cotyledon of a germinating seed remains in the soil.
- This type of germination is commonly seen in monocotyledonous seeds like

Maize grain	oats
Rice grain	millet
Wheat	sorghum
Barley etc	

An illustration showing the stages involved in hypogeal germination



SEED VIABILITY

This is the ability of a seed to germinate under favourable conditions

Qualities of a viable seed

- It should be mature
- It should be free from pests and diseases
- It should be whole
- It should be well dried

SEED DORMANCY

Seed dormancy is the condition when a seed fails to germinate

Causes of seed dormancy

- Too much heat in the soil

- Having a too hard tests or seed coat
- Planting immature seeds
- Planting broken seeds
- Planting infected seeds

Question

1. What is germination?
2. State the importance of water to a seed during germination
3. Mention any two conditions that makes a seed fail to germinate
4. Name the gas needed for a maize grain to germinate
5. To which type of germination does a cowpea seed undergo?

CROP GROWING

A crop is a plant grown and cared for a purpose

Common examples of crops

- Maize - sugarcane
- Cassava - beans
- Trees - irish potatoes
- Bananas - millet
- Sweet potatoes - yams
- Vanilla - coffee
- Cotton etc

Groups of crops

- Annual crops
- Perennial crops

Annual crops

Annual crops are crops that mature within a year

Note: These crops are harvested once in the season

Examples of annual crops

- Beans
- Groundnuts - watermelon

- Soya beans
- Cow peas
- Maize
- - millet
- Rice
- Sorghum
- Cotton
- Egg plant
- pumpkin
- tomatoes
- cabbages
- nakati
- dodo
- broccoli
- onion
- sweet potatoes etc

Note: The above crops are also called seasonal crops

Perennial crops

Perennial crops are crops that take more than one year to mature.

Note: These crops are harvested many times in a year once they are mature.

Examples of perennial crops

- Coffee
- Sugarcane
- Vanilla
- Banana
- Tea
- cocoa
- pineaple
- jackfruit
- avocado
- oil palm

Garden tools/equipment/materials

Garden tools are materials used in garden for work

Examples of garden tools

Garden tool	**Diagram**	**Function**
(1) Garden hoe		For digging, weeding, harvesting and planting
(2) Garden fork/manure fork		

For turning manure

(3) Sickle

For harvesting rice and millet

For cutting grass for animals

(4) Trowel

For Transplanting seedlings

(5) Forked hoe

For digging hard soils

(6) Watering can

For watering crops

(7) Rake

- For collecting rubbish
- Spreading manure
- Leveling the soil

(8) Pruning saw

For pruning

(9) Axe

- Cutting down big trees
- Splitting firewood

(10) Pick axe

(11) Panga

Cutting small trees

(12) Wheel barrow

Carrying manure, garden tools and harvested crops

(13) Spade

Loading manure and soil

(14) Knap sack sprayer

Used for spraying crops

Questions:

1. What name is given to a plant grown and cared for a purpose?
2. Crop growing is a very important activity. Mention any two examples of common crops grown at home
3. How useful is a garden tool below to a rice grower?

4. In which season is a watering can commonly used?
5. Why is it not advisable for a farmer to leave a panga during a rainy season?

CROP GROWING PRACTICES

Crop growing practices are activities done by a farmer during crop growing

Examples of common crop growing practices

- Clearing land
- Selecting seeds
- Planting
- Weeding
- Thinning
- Pruning
- Mulching
- Manuring
- Gap filling
- Watering
- Spraying
- Harvesting
- Storage of crops etc

Clearing land or land preparation

This practice is best done in a dry season. Why? For proper drying of the weeds after digging

Ways of clearing land

- By slashing
- By digging

Garden tools used when clearing land

- Garden hoe
- Slasher
- Panga
- Axe
- Ox plough
- Tractor

Reasons why people prepare land

- To make the soil soft
- To make planting easy
- To control weeds
- To enable water enter the soil deeply

Seed selection

This is the sorting of healthy seeds from bad seeds

Reasons why farmers select seeds before planting

- To promote seed viability
- To ensure quality plants in the garden
- To ensure high crop produce
- To prevent crop pest and disease
- To prevent wastage of land
- To prevent wastage of labour

Planting or sowing seeds

- Planting is the putting of planting materials in the soil
- Planting or sowing of seeds is best done in a wet season. Why? There is enough water for seeds to germinate

Examples of planting materials

- Seeds
- Stem cutting
- Bulbs
- Sweet potato vines
- Stem tubers
- Suckers etc

Qualities of good planting materials

- They should be free from pests
- They should be mature
- They should be well dried
- They should be of the same variety

Questions

1. In which season do farmers sow their seeds?
2. Identify any two importance of selecting seeds before planting
3. Name any two garden tools used in clearing land.
4. Give any one example of planting materials

Methods of planting

- Row planting methods
- Broad casting methods

Row planting method

Row planting method is where crops are grown in rows or lines

Examples of crops grown in rows or lines

- Maize
- Sugarcane
- Banana
- Mangoes
- Beans
- Groundnuts
- Soya beans
- Pineaples etc

Advantages of using row planting method

- It makes weeding easy
- It makes mulching easy
- It ensures proper spacing of crops
- It prevents the easy spread of pests and diseases
- It makes harvesting easy
- It prevents the wastage of seeds
- It ensures high crop produce

Disadvantages of using row planting

- It is time consuming
- It needs a lot of skilled labour
- It needs a lot of land
- It is tiring and tiresome

An illustration showing the crops grown in rows

Broadcasting method

This is where seeds are scattered randomly in the garden

Examples of seeds or crops grown by broad casting method

- Simsim
- Millet
- Sorghum
- Rice etc

Advantages of using broadcasting method

- It saves time
- Many crops can be grown in a small piece of land

- Oxen can be used in planting crops

Disadvantages of using broadcasting method

- It makes weeding not easy
- It makes mulching not easy
- It makes harvesting not easy
- There is easy spread of pests and diseases
- There is a wastage of seeds

An illustration showing crops grown using broadcasting method

Questions

1. Name any one method used in planting crops
2. State any two advantages of planting crops in rows
3. Mention two crops grown by broad casting method
4. Give one danger caused by row planting method to a farmer

A Nursery bed

A nursery bed is a small garden where seedlings are raised before taken to the main garden.

OR

A nursery bed is a small garden where seeds are first planted to develop into seedlings before taken to the main garden.

Seedlings

A seedling is a young growing plant in the garden

Transplanting

- This is the transfer of seedlings from the nursery bed to the main garden
- Transplanting is best done in the evening. Why? The rate of transpiration is low
- Transplanting is done using a garden tool unknown as a garden trowel

Examples of seeds or crops grown in a nursery bed

- Tomatoes
- Watermelon
- Rice
- Onions
- Green pepper
- cabbages
- coffee
- egg plants
- garlic
- spinach etc

Factors considered when selecting a site for a nursery bed

- It should be free from diseases and pests
- It should be near a water source
- It should be well drained
- It should be able to receive light from the sun

Importance of a nursery bed

- It protects seedlings from bad weather
- It enables water to sink deeply in the soil
- It provides shade to seedlings
- It helps a farmer to make proper selection of seedlings
- It helps a farmer to give extra care to seedlings

Questions

1. When is the time for transplanting seedlings?
2. Mention any two importance of a nursery bed to the seedlings
3. Name any two crops which are first grown in a nursery bed
4. Identify the garden tool used to transplant seedlings
5. Briefly explain the word transplanting

Weeding

Weeding is the removal of unwanted plants from the garden

Weeds

Weeds are unwanted plants in the garden

Common examples of weeds

- Elephant grass
- Spear grass
- Black jack
- Couch grass
- Wondering jew
- Milk weed
- Pig weed
- Goat weed
- Wild finger millet weed
- Nut grass
- Star grass etc

Importance of weeds to man

- Some weeds are eaten as food
- Some weeds are used as herbal medicine e.g black jack etc
- Some weeds are used as animal feeds
- Some weeds are used to thatch houses
- Dry weeds are used as mulches in the garden etc

Dangers of weeds

- They hide crop pests
- Some weeds are poisonous to man
- They lower the crop produce
- Weeds compete with crops for plant nutrients

Ways farmers can control weeds in the garden

- By mulching
- By spraying them using herbicides
- By uprooting and burning them
- By digging them out
- By controlled grazing

Importance of weeding in crop growing

- Creates space in the garden
- Controls crop pests
- Makes harvesting easy
- Improves on the crop yields (produce)
- Reduces on the competition for plant nutrients

Reasons why farmers weed crops

- To create space in the garden
- To make harvesting easy
- To reduce on the competition for plant nutrients
- To control crop pests etc

Question

Weeds are unwanted plants in the garden

(a) Name two examples of such weeds
(b) Identify 3 ways farmers can make use of the above weeds
(c) Mention any two ways farmers can get rid of weeds from the garden
(d) State two reasons why farmers carry out weeding in crop growing
(e) Write down two dangers of weeds to crops

Pruning

Pruning is the removal of unwanted parts from a plant

Note: Unwanted parts may be excess or diseased leaves and branches

Examples of plants that are pruned.

- Banana
- Coffee
- Mangoes
- Maize
- jackfruits etc

Garden tools used for pruning

- panga

- knife
- secateurs
- shears
- pruning saw

Advantages of pruning crops

- Creates space in the garden
- Reduces on the weight of a plant
- Gives the plant shape
- Makes harvesting easy
- Reduces on the rate of transpiration
- Controls crop pests

Mulching

Mulching is the covering of top soil with dry plant materials

Mulches

These are dry plant materials used for mulching

Examples of mulches

- Dry grass
- Saw dust
- Coffee husks
- Sugarcane husks
- Dry banana leaves and fibres
- Maize cobs etc

Advantages of mulching

- It makes the soil fertile. How? Mulches rot and form humus
- It controls soil erosion. How? Mulches reduce on the speed of flowing water
- It controls the growth of weeds
- It keeps water in the soil

Disadvantages of mulching

- Dry mulches can easily catch fire
- They hide crop pests
- Some mulches grow into weeds
- Mulches hide dangerous wild animals

Questions

1. What is pruning?
2. Name one garden tool farmers use to prune crops?
3. How does mulching control soil erosion?
4. State one way farmers can help plants to reduce on the rate of transpiration
5. Identify one way mulches can be dangerous to farmers

Thinning

This is the removal of unwanted crops from the garden.

Importance of thinning in crop growing

- Creates space in the garden
- Reduces on competition for nutrients among crops
- Ensures proper spacing of crops
- Improves on crop produce
- Makes harvesting easy etc

Manuring

Manuring is the act of adding manure in the soil

Materials used to make manure

- Water
- Cowdung
- Urine
- Ash
- Birds droppings
- Banana peelings
- Dry grass leaves

Importance of manuring the soil

Manuring makes the soil fertile

Other ways of making the soil fertile

- By crop rotation
- By mulching
- By bush fallowing

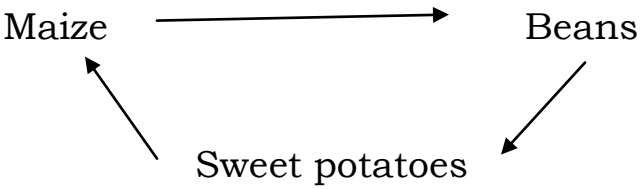
Crop rotation

Crop rotation is the growing of different types of crops in the same piece of land seasonally

Importance of crop rotation

- It controls soil erosion
- It controls crop pest. How? Crop rotation starves crop pests
- It maintains soil fertility
- It improves on crop yields

An illustration showing crop rotation



Questions

1. Write down two ways farmers improve on the fertility of the soil
2. Identify two materials used to make manure
3. How does crop rotation control crop pests?
4. State one importance of thinning in crop growing.
5. Mention one reason why farmers add manure in the soil.

Harvesting

Harvesting is the removal of ready crops from the garden

Harvesting is best done in dry season. Why? There is enough sunshine for proper drying of the harvested crops

Methods of harvesting crops

1. Uprooting crops e.g carrots, beans, soyabeans, groundnuts etc
2. Cutting their stems e.g sugarcane, sorghum, rice, banana, millet etc

3. Digging them e.g cassava, sweet potatoes, irish potatoes, ginger, yams etc
4. Hand picking e.g cotton, coffee, tea, miraa, vanilla
5. Plucking e.g tea, maize, oranges, mangoes

Garden tools used in harvesting crops

- Garden hoe
- Sickle
- Knife
- Panga
- Forked hoe

Reasons why farmers harvest crops

- For future use
- To prevent wastage of food
- For proper storage of crops

Storage of the harvested crops

Storing is the keeping of harvested crops safely for future use

Places where harvested crops are stored

- Granary
- Silos
- Sacks
- Baskets etc

A granary

This is a traditional structure used to keep the harvested crops

Examples of crops stored in a granary

- Dried Beans
- Dried Millet
- Dried cassava
- Dried Sorghum
- Groundnuts
- Simsim
- Rice etc

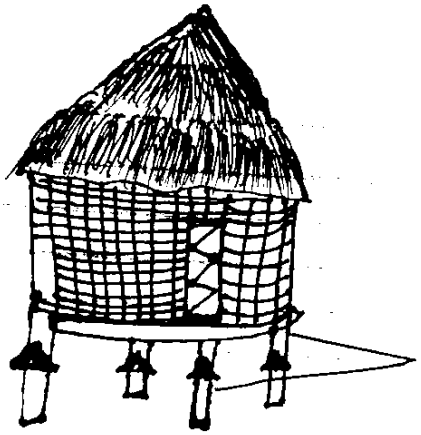
Qualities of a good crop store (granary)

- It should have rat guards. Why? To prevent rats from entering the granary
- It should be always clean and dry
- It should be raised from the ground. Why? To prevent flowing water from entering the granary
- It should not leak

Pests that destroy stored crops

- Termites
- Weevils ie bean weevils, maize weevils
- Rats
- Harvest mites
- Storage beetles

A structure of the granary



Rat guards

Note: Rat guards prevent rats from entering the granary

Questions

1. Which season is the best for harvesting crops
2. Mention two qualities of a good crop store
3. Give any two ways farmers harvest crops
4. Name two pests which destroy stored crops
5. State one reason why a granary should have rat guards

Crop pests

Crop pest are organisms that spoil crops

OR

Crop pests are living things that spoil or destroy crops

Examples of crop pets

- Monkeys
- Locusts
- Rats
- Termites
- Weevils
- Aphids
- American boll worms
- Army worms
- Squirrels
- Mole rats
- Harvest mites
- Beetles
- Caterpillars etc

Types of pests

Garden pets

These are living things that spoil crops in the garden

Examples of garden pests

- Monkeys
- Locusts
- Rats
- Termites
- Weevils
- Aphids
- Mole rats
- Squirrels etc

Storage pets

These are organisms that destroy crops in the store. E.g

- Rats
- Weevils
- Termites
- Harvest mites etc

Signs of infected crops

- Yellowish leaves
- Stunted growth
- Black spots on leaves
- Dried parts on a plant
- Holes in leaves, stems, fruits and roots
- Rotten parts on a plant
- Immature ripening of fruits

Dangers of pests and diseases to crops

- They lead to stunted growth
- They lead to low crop produce
- They lead to wilting of crops
- They damage crops
- They lower the quality of crop yields

Ways farmers control crop pests

- By practicing crop rotation
- By guarding the garden
- By fencing the garden
- By setting traps in the garden
- By putting scare crows in the garden
- By spraying using pesticides
- By poisoning them
- By timely weeding
- By early harvesting

Some examples of crop diseases

Diseases	**Crops**
Cassava mosaic	Cassava
Panama, banana wilt	Banana
Groundnut rosette	Groundnuts
Smuts	Millet, rice, maize, sorghum etc
Maize streak	Maize

Coffee rust	Coffee
Tomato blight	Tomatoes
Sweet potato wilt	Sweet potatoes

Ways farmers control crop diseases

- By spraying the crops using pesticides
- By growing clean/healthy planting materials
- By uprooting and burning the infected crops

Questions

1. How are locusts dangerous to the environment?
2. Mention two signs of infected crops
3. In the list below, circle the examples of storage pests
   Monkey, rat, locusts, termites, mole rats, weevils, squirrels
4. Identify two ways farmers can get rid of crop pests in the garden
5. Write down two dangers of pests to crops

THEME 2: OUR ENVIRONMENT

TOPIC 3: <u>Weather changes</u>

Weather is the state of the atmosphere at a given time

<u>Element/Aspects/Factors of weather (weather makers)</u>

- Rain
- Wind
- Sunshine
- Clouds
- Temperature
- Humidity
- Air pressure

<u>States/condition/changes and types of weather</u>

- Rainy
- Windy
- Sunny
- Cloudy

<u>Rain</u>

Rain is the amount of water drops falling from the sky.

<u>Rainfall</u>

Rain is the amount of rainwater received in an area

Rainfall is measured in millimeters (mm)

Why?

To know the depth of water that entered the soil

Rainfall is measured using a rain gauge

<u>Importance of rain fall</u>

- It provides water for domestic use
- It adds water in water bodies
- It helps plants to make their food
- It softens the soil for plants to grow

<u>Dangers of too much rainfall</u>

- It leads to floods
- It leads to soil erosion
- Too much rainfall makes murram roads muddy/slippery
- Too much rainfall destroys crops
- Too much rainfall destroys property
- It leads to landslides

Activities done in rainy weather

- Harvesting rain water
- Kneading soil for brick making

Activities done in wet season

- Planting
- Weeding
- Spraying pesticides

Items used to harvest rain water

- Basin
- Pot
- Bucket
- Saucepans
- Water tanks
- Water drums

Items used to manage rainy weather

- Umbrellas
- Gumboots
- Raincoats
- Banana leaves

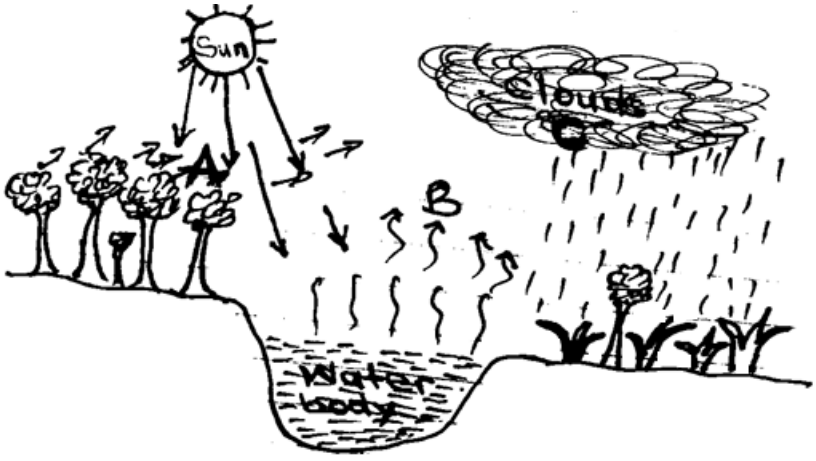
Water cycle

Water cycle is a natural process by which rain is formed

Processes involved in water cycle

- Evaporation
- Transpiration
- Condensation

An illustration showing water cycle



Identify the processes marked;

(i) A – Transpiration
(ii) B – Evaporation
(iii) C – condensation

Note:

- The heat from the sun heats water in the water body to cause evaporation.
- The heat from the sun heats the plants to cause transpiration

Rain is the main natural source of water

Clouds

Clouds are masses of condensed water vapour in the atmosphere

Importance of clouds

- Nimbus clouds provide rain
- Clouds protect us from direct sunshine
- They cool the temperature

Dangers of cloud cover

- It causes accidents in air crafts
- Clouds block sunshine from reaching harvested crops
- Clouds cause darkness

Types of clouds

- Nimbus clouds
- Cirrus clouds
- Cumulus clouds

- Stratus clouds

Cirrus clouds

- They look like feathers in the sky
- They are furthest in the sky
- They appear in dry weather

Stratus clouds

- Stratus clouds are at low altitude which spread out widely calm flat layers
- They are a sign of fair weather

Cumulus clouds

- Cumulus clouds are puffy white which resemble pieces of cotton wool
- They commonly appear in the sky in hot afternoon hours
- They develop into thunder clouds hence sign of rain

Nimbus

- Nimbus clouds are rain clouds ie They provide rain
- They are dark grey and appear at a low attitude
- They are the nearest to the earth

Question

1. Identify the type of clouds which appear; the highest in sky.
2. Mention two conditions of weather
3. In which way does a crop farmer benefit from windy weather?
4. Some clouds provide rain to the environment. How is it important to a farmer?
5. State the role played by the sun in the rain cycle

Wind

Wind is moving air

OR

Wind is air in motion

Importance of wind

- It is used for winnowing harvested crops
- It takes away bad smell in the environment
- Wind helps in pollination
- Wind helps in seed dispersal
- Wind moves boats
- It turns wind mills
- It helps in playing some games like flying kit
  flying paper Aeroplan

Dangers of strong wind

- It destroys crops
- It destroys property
- It leads to soil erosion
- It capsizes boats
- It leads to easy spread of air-borne diseases

Instruments associated with wind

(i) Wind vane – To show direction of wind
(ii) Anemometer – To measure the speed of wind.
(iii) Wind sock – To show the strength of wind and direction

Sunshine

Importance of sunshine in the environment

- Sunshine helps in rain formation
- Sunshine helps to dry harvested crops
- Sunshine helps to dry clothes
- Sunshine kills germs in the environment
- It helps the skin to make vitamin D

Dangers of too much sunshine in the environment

- Too much sunshine dries small water bodies
- It kills animals in the environment
- It dries immature crops
- Too much sunshine damages eyes
- It damages skin

Questions

1. Give a reason why farmers harvest their maize crops in a dry season
2. In which way is wind useful to children at school?
3. Identify the weather instrument that helps Rose to know how deep rain water enters soil?
4. Mention any two dangers of each of the following;
   (i) Wind
   (ii) sunshine
5. How useful is sunshine to a crop farmer?

Temperature

- Temperature is the degree of hotness or coldness of a place
- Temperature is measured in degrees
- Temperature is measured using thrmometers
- Temperature is measured in two scales i.e
  Celsius or centigrade scale
  Fahrenheight scale

Types of thermometers

- Clinical or Doctor's thermometer
- Six's thermometer (minimum and maximum thermometer)
- Scientific ordinary thermometer
- Wall thermometer

Clinical thermometer

- It is used in hospitals by health workers
- Clinical thermometer is also called doctor's thermometer
- Clinical thermometer is used to measure the human body temperature.
- The normal human body temperature is 37^0C or 98.4^0F

Places where clinical thermometer are found

- Hospitals
- Clinic
- Dispensary

- Pharmacy
- Home
- Schools
- Aeroplanes

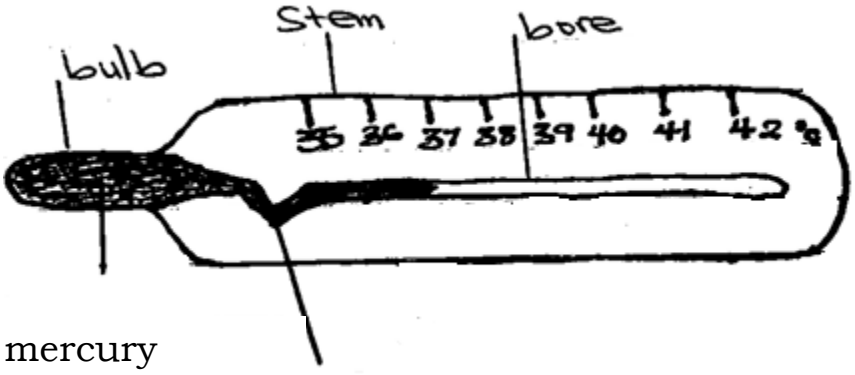
Parts of the body where the clinical thermometer is placed when taking the body temperature

- In the anus
- Under the tongue
- Under the armpit
- In the vagina

Note:

- The clinical thermometer is placed under the tongue not just in the mouth to prevent breaking it by the teeth
- It is placed in the anus and under the armpits because they cover the whole bulb for accurate body temperature measurements
- Clinical thermometer is disinfected before using it on another patient to kill germs
- A clinical thermometer is disinfected by dipping it in alcohol
- A clinical thermometer is not disinfected by boiling because it breaks the glass
- A clinical thermometer is reset by shaking to push mercury back to the bulb.

<u>Parts of a clinical thermometer</u>



<u>Functions of each part</u>

Kink/bend/constriction

- It prevents the back flow of mercury

Bulb

- It stores mercury

Stem

- It protects the bore

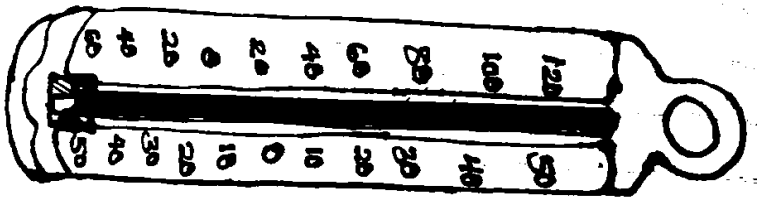
Wall thermometer

- Wall thermometer is used to measure room temperature

Places where wall thermometers are found

- Offices
- Classes
- Bedrooms
- Living rooms

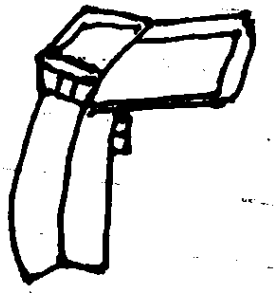
Structure of a wall thermometer



Temperature gun

- A temperature gun is used for measuring human body temperature
- A temperature gun works by focusing light that is coming from the object in the form of Rays and funneling that light.

Structure of a temperature gun



Liquids used in thermometers

- Alcohol
- Mercury

Questions

1. What is temperature?
2. In which units is temperature measured?
3. How useful is a clinical thermometer to a health worker?
4. Identify the liquid metal used in thermometers
5. Of what importance is the kink in a clinical thermometer?
6. What makes clinical thermometers suitable for measuring human temperature?

Reasons for using mercury in clinical thermometer

- It does not stick on the walls of thermometers
- It is a good conductor of heat
- It is easily seen
- It expands uniformly
- It does not evaporate easily

Reasons why alcohol is not commonly used in thermometers

- It is not easily seen
- It does not expand uniformly
- It evaporates easily
- It sticks on the walls of thermometers
- It wets the glass tube of thermometers

Questions

1. Identify any one common liquid used in thermometers
2. Give two reasons why mercury is commonly used in thermometers
3. why is alcohol not used in clinical thermometers?

4. How is a clinical thermometer reset?
5. In which way is a wall thermometer useful at home?

THME 3: HUMAN HEALTH

TOPIC 4: PERSONAL HYGIENE

- Personal hygiene is the keeping of the body clean and the things we use
  OR
- Personal hygiene is the general cleanliness of the body

Importance of personal hygiene

- Helps to prevent bad body smell
- Helps to prevent some diseases like
  - Ringworm infection
  - Scabies
  - Diarrhoea
  - Cholera
    etc
- Helps to remove dirt

<u>Ways of keeping the body clean</u>

- By regular bathing
- By brushing teeth daily
- By cutting fingernails short
- By washing and sundrying beddings
- By combing hair
- By trimming/shaving hair

<u>Things used to keep the body clean</u>

Name	**Diagram**	**Function**

(1) Bathing sponge

For scrubbing dirt on the body

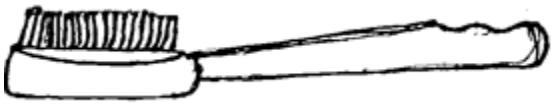
(2) Loofah

For scrubbing dirt on the body

(3) Pumice stone

For scrubbing the feet

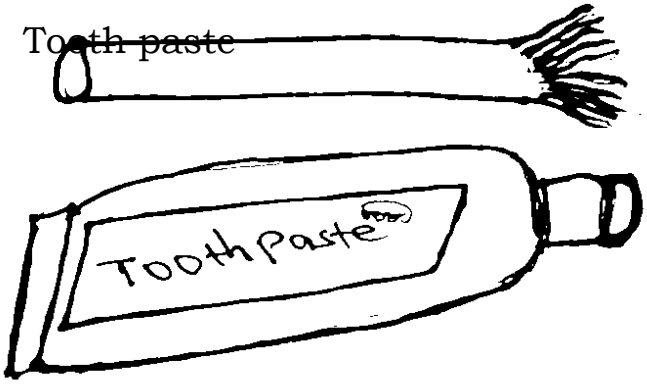
(4) Toothbrush



For brushing teeth

(5) Chewed stick

For brushing teeth

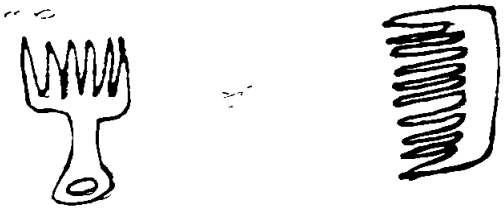


- For brushing teeth
- For killing germs on the teeth
- It has fluoride for hardening enamel

(6) Soap

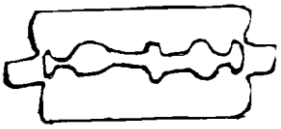
- For bathing
- For killing germs on the body
- For washing clothes

(7) Comb



For combing hair

(8) Razorblade



(9) Towel

For drying the body after bathing

Beddings

Beddings are materials used for lying on while sleeping

Examples of beddings

- Bedsheets
- Blanket
- Pillow case
- Matresses

Ways of caring for clothes and beddings

- Washing them
- Ironing them
- Displaying them under sunshine

Reasons for keeping the clothes and beddings clean

- To prevent easy spread of skin diseases like; scabies, ringworm infection
- To prevent bad smell
- To prevent parasites like lice, bed bug, ticks, fleas

Importance of regular bathing

- Prevents bad body smell
- It removes dirt on the body
- It prevents skin diseases

Dangers of not bathing

- It leads to bad body smell
- It leads to skin diseases

Reasons for brushing teeth

- To promote oral health
- To promote dental health

Dangers of not brushing teeth

- It leads to bad breathe
- It leads to tooth decay

Reasons for cutting fingernails short

- To remove hiding places for germs
- To prevent cuts/scratches

Dangers of not cutting fingernails short

- They hide germs which cause diseases
- They cause cuts

Dangers of poor personal hygiene

- It leads to bad body smell
- It leads to diseases
- It leads to bad breath
- It leads to cuts
- It leads to breeding of parasites like rice

REVISION QUESTIONS ABOUT PERSONAL HYGIENE

1. Give the meaning of personal hygiene
2. State two importance of keeping the body clean
3. Identify two diseases a P.4 child can get due to poor personal hygiene
4. Suggest three ways Rose can keep her body clean.
5. Draw these items used in promoting personal hygiene

(i) Bathing sponge	(ii) Tooth brush

6. Of what importance is fluoride in toothpaste in the act of brushing teeth?
7. A razor blade is an item used to keep the body clean. How dangerous is it to a P.4 boy?
8. How can a P.4 girl manage the cleanliness of her beddings?
9. Write one danger of not brushing teeth.
10. State the importance of displaying beddings under sunshine.