

# SCIENCE LESSON NOTES

## TERM ONE

P. 4.

## PLANT LIFE.

### Week two lesson one.

#### Types of plants.

1. Flowering plants
2. Non-flowering plants.

#### Non- flowering plants

These are plants which do not produce or bear flowers.

#### Examples of non-flowering plants:

- i. Pines
- ii. Ferns mosses
- iii. Eucalyptus
- iv. Mosses

#### Difference between plants and animals.

1. Plants make their own food while animals feed on plants and other animals.

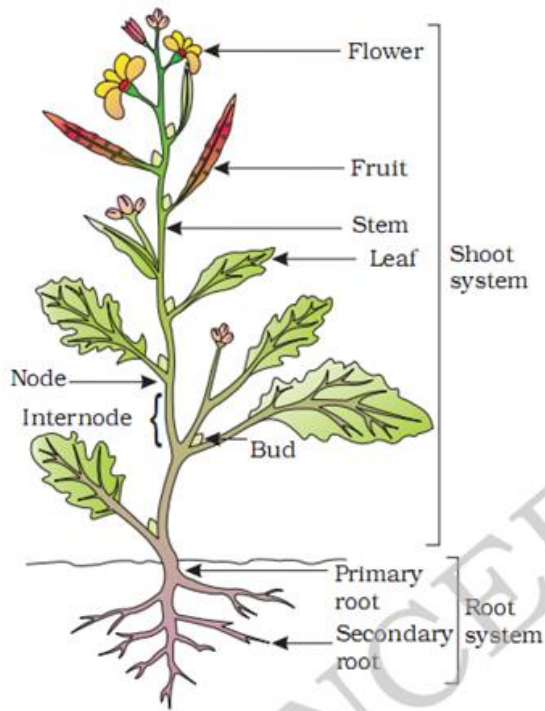
#### Flowering plants:

These are plants that produce or bear flowers.

#### Examples of flowering plants:

- |             |                  |
|-------------|------------------|
| 1. mangoes  | 6. cotton        |
| 2. maize    | 7. Oranges       |
| 3. pawpaw's | 8. Jackfruit.etc |
| 4. peas     |                  |
| 5. coffee   |                  |

#### Structure of a flowering plant.



#### Activity ;

1. Name two groups of plants.
2. How do flowering plants reproduce?
3. Of what use are plants to people

## Week two lesson two.

Systems of a flowering plant:

1. Shoot system.
2. Root system

### Shoot system.

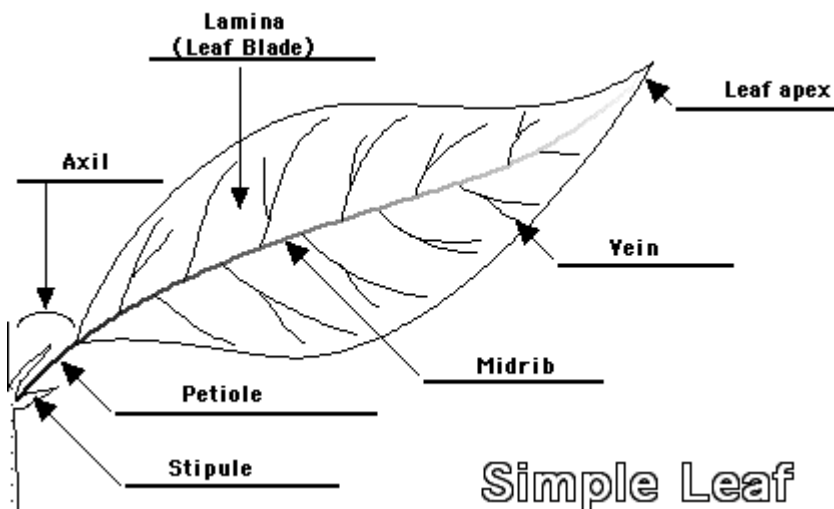
1. The system of the plant above the ground level.
2. It develops from the Plumule of the seed.

### Parts of the shoot system.

4. Leaves
5. Fruits
6. Node
7. Terminal bud
8. Stem
9. Flower
10. Internode
11. Auxiliary bud

Leaves:

Parts of a leaf:



### Functions of each part:

Leaf stalk ( petiole ):

To supply water to the leaf from the branch or stem.

Leaf base:

Attaches the leaf on to the stem.

Midrib / midvein:

Transports water and nutrients from the leaf stalk to other parts of the leaf.

**Veins.**

- Supply water and minerals from the mid vein to all parts of the leaf.
- Collects manufactured food from all parts of the leaf to the mid vein.

**Stomata.**

- For breathing.
- For transpiration.

**Lamina ( leaf blade )**

- For making food / photosynthesis.

### **Activity ;**

- 1. Name two main parts of a flowering plant.**
- 2. In which system of a flowering plant do we find the leaf ,flower and terminal bud?**
- 3. How is a leaf important to a mango plant ?**

## **Week two lesson three.**

### **Leaf venation.**

This is the arrangement of veins in a leaf.

Types of leaf venation:

1. Network leaf venation
2. Parallel leaf venation.

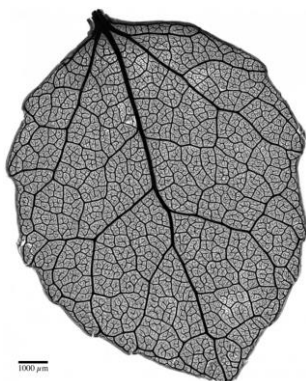
### **Parallel leaf venation.**



Examples of plants with parallel leaf venation:

1. All cereals eg maize, millet, wheat etc.
2. Grass.
3. Sugar cane.

### **Network leaf venation:**



Examples of plants with network leaf venation:

1. All legumes eg beans, soya beans, peas, ground nuts.
2. Jack fruit.
3. Mango plant.
4. Coffee plant.

**Activity;**

1. Briefly explain the meaning of leaf venation.
2. State the two types of leaf venation.
3. Write down one example of a plant with ;
  - a) Parallel leaf venation
  - b) Network leaf venation

## **Week two lesson four and five.**

**Type of leaves.**

1. Simple leaves
2. Compound leaves.

**Simple leaves:**

They are leaves with one leaflet on the stalk.

**Characteristics of simple leaves.**

1. They have one leaflet on the stalk.
2. They have one margin.

**Examples of simple leaves:**

**Simple entire.**



**Plants with simple entire leaves:**

1. Mango
2. Jack fruit
3. Avocado

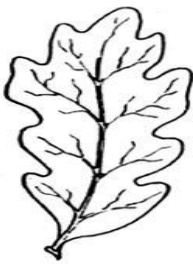
**Simple serrated.**



### Examples:

1. Black jack
2. Lantana camara.

### Simple lobbed leaf



LEAF

### Simple palmate.

Line Maple



Slichter 97

### Example Pawpaw leaf.

### Simple lanceolate.



### **Examples**

- 1. Maize**
- 2. Sugar cane**
- 3. Sorghum.**

### **Compound leaves;**

They are leaves with many leaflets on one stalk.

### **Characteristics of compound leaves:**

**They have many leaflets on a leaf stalk.**

### **Examples of compound leaves:**

**Compound pinnate leaves eg acacia.**



**Compound bi-pinnate leaves eg jacaranda.**



**Compound trifoliate leaves eg beans.**



**Compound digitate eg groundnut**



### Activity;

1. Name any one type of leaf.
2. Give one example of a compound leaf.
3. Draw a compound trifoliate leaf.

## Week two lesson Six

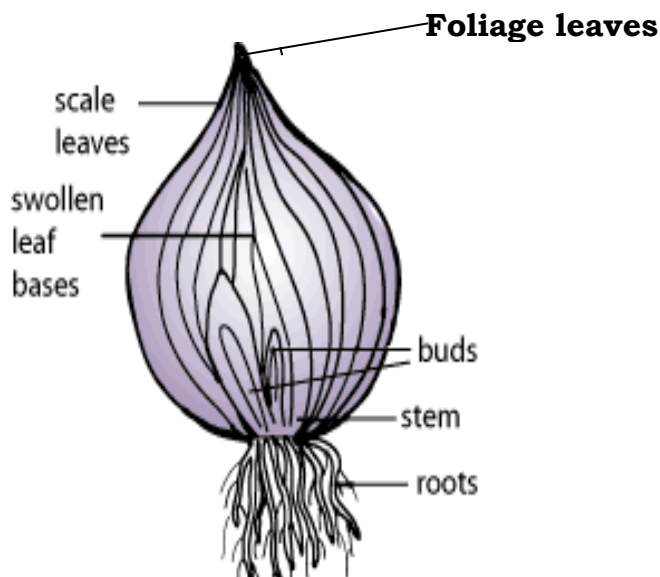
### Uses of leaves to people:

- **Some leaves are eaten as food eg cabbages, onions etc**
- **For sale**
- For thatching houses.
- For making decorations eg palm leaves
- For beverage eg tea leaves
- For herbal medicine eg mango leaves, guava leaves etc
- **For feeding domestic animals.**
- **For making mats.**
- **For study purposes.**

### Uses of leaves to a plant.

- **For making food ( photosynthesis )**
- **For breathing.**
- **For transpiration.**
- **Some store food for the plant eg onions and cabbages**
- **Some are used for propagation eg bryophyllum**

### The onion bulb.



### Functions of parts of the onion.

**Foliage leaves:** make food for the onion.

**Fleshy leaves;** store food for the onion.

**Scaly leaves;** protect the inner parts of the bulb.

**Axillary bud;** grows into a new plant / shoot system.



**Stem;** -holds the leaves together

- passage for water and mineral salts from the soil to the leaves.
- produces leaves, roots and buds.

**Activity;**

1. Suggest any two uses of leaves to animals;
2. Give any two uses of leaves to a plant
3. Which part of an onion grows into a new plant?

## **Week two lesson seven.**

**Transpiration.**

It is the process by which plants lose water in form of vapour to the atmosphere.

**Importance of transpiration to plants.**

- It cools the plant
- It helps the plant to suck more water from the soil. ( increases osmosis)

**Importance of transpiration in the environment.**

- It helps in rain formation.

**An illustration to show how transpiration occurs.**



**How plants control the rate of transpiration.**

- By shedding their leaves.
- Some plants have small leaves.
- Some plants have thick leaves with few stomata.
- Some plants have wax on their leaves.
- Some plants have thorns instead of leaves.

**Factors affecting the rate of transpiration.**

- Size of the leaf: the larger the leaves, the higher the rate of transpiration.
- Temperature; the higher the temperature, the higher the rate of transpiration.
- Humidity; the higher the humidity, the lower the rate of transpiration.

**Activity;**

1. In one sentence give the meaning of transpiration?

**2. How is transpiration important to plants?**

**3. Name one way how plants reduce the rate of transpiration.**

## **Week three lesson one.**

### **Photosynthesis.**

It is the process by which plants make their own food.

Photo means light.

Synthesis means to make, manufacture or build.

### **Conditions for photosynthesis.**

**Chlorophyll; traps sunlight energy.**

**Sunlight;** provides energy required for photosynthesis.

**Carbon dioxide and water;** are raw materials for photosynthesis.

**NB:** the byproducts of photosynthesis are oxygen and water vapour.

### **Stems**

#### **Uses of stems to people and other animals.**

- Some stems are eaten.
- Some stems are used as firewood.
- For herbal medicine.
- For making timber.
- For sale.
- For study purposes.
- some are habitats for some animals eg ants and birds

#### **Uses of stems to a plant.**

- Transports water and mineral salts from the roots to the leaves.
- Transports food from the leaves to other parts of the plant.
- Some stems are used for breathing.
- Some stems are used for propagation eg cassava and sugar cane.
- Stems support leaves and branches of a plant.
- Some stems store food for the plant eg irish potatoes and sugar cane.

### **Activity;**

**1. Briefly explain the meaning of photosynthesis.**

**2. Mention any two conditions for photosynthesis to take place.**

**3. How is a stem useful to ;**

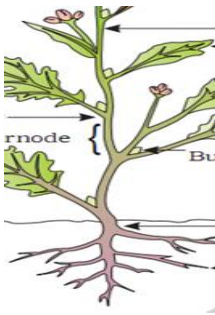
**i) People.**

**ii) Plants.**

## **Week three lesson two.**

### **Types of stems.**

**Upright stem ( erect stem )** eg mango stem, orange stem, maize stem etc.



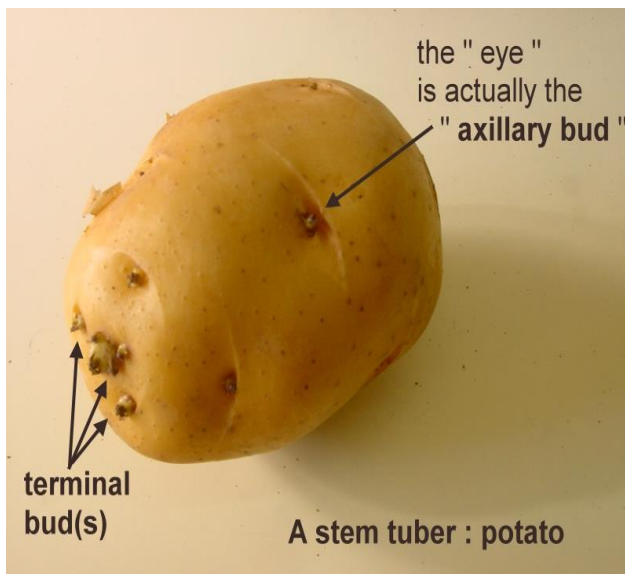
**Climbing stems** eg cucumber, coco yam, pea plants, morning glory etc

**Underground stems.**



**Stem 1**  
potato

swollen underground stems with stored food eg irish  
s.



**Creeping stems** eg sweet potatoes



**NB:** sugar cane is not a stem tuber because its stem is not found underground.

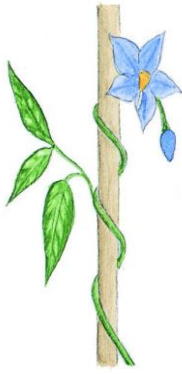
**Ways plants climb others.**

**Using tendrils** eg passion fruits, cucumber, peas, pumpkins etc.



**Using hooks or thorns** eg bougainvillea

**By twinning (clasping)** e.g. morning glory, some beans and spang.



**Why some plants climb others.**

- For support
- To get enough sunlight energy.

**Activity;**

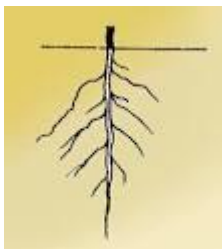
1. Give any one type of stem.
2. How do plants with weak stems climb others?
3. Why do plants with weak stems climb others?

## Week three lesson three.

**Root system:**

It is the part of a plant below the ground level.

**Tap root system.**



**Examples of plants with tap root system.**

- Mango plant
- Bean plant
- Jack fruit plant
- Orange plant

**Main root:** Holds the plant firmly in the ground.

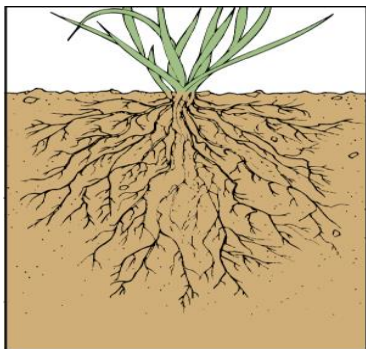
**Lateral roots:** Holds the plant firmly in the ground.

**Root hairs:** Suck water and mineral salts from the soil.

**Root cap:** Protects the growing tip of the roots.

**Fibrous root system.**

The roots grow from one point at the base of the stem.



### **Examples of plants with fibrous root system.**

- Maize plant
- Sorghum plant
- Millet plant
- Rice plant.

**NB:** all cereal have fibrous root system.

### **Types of roots;**

- **Primary roots**

These are the roots which develop from the radical.

Examples of primary roots are: (i) tap root (ii) fibrous roots

### **Secondary roots.**

These are the roots which develop from other parts of the plant rather than the radical.

### **Examples of secondary roots.**

- Prop roots
- Adventitious roots
- Breathing roots
- Clasping roots
- Buttress roots
- Stilt roots.

### **Prop roots: they are commonly found on cereals.**

Their main purpose is to give extra support to the plant.

### **Examples of plants with prop roots**

- Maize plant
- Sugar cane plant
- Sorghum plant
- Barley plant



### **Adventitious roots.**

They develop from the stems of the plant.

### **Examples of plants with adventitious roots.**

- Onion plant
- Banana plant
- Pumpkin plant

- Pineapple plant.

### Activity;

1. Mention any one type of root system.
2. How important is a root cap in a root system?
3. In the space below draw a tap root system.

## Week three lesson four.

### Uses of roots to people.

- Some roots are eaten
- Some are for herbal medicine.
- Some are sold for money
- For study purposes.

### Uses of roots to plants.

- Roots hold the plant firmly in the soil.
- They suck water and mineral salts from the soil.
- Some are used for breathing
- Some store food for the plant eg cassava root, sweet potato root and carrots.
- Some roots have root nodule which nitrogen fixing bacteria.

### Root tubers.

These are plants with swollen underground roots with stored food.

### Examples are;

- Sweet potato plant
- Cassava plant
- Carrot plant.

## Week three lesson five and six

### Flowers.

A flower is the reproductive part of a plant.

### Uses of flowers to plants.

They are used for reproduction.

### Uses of flowers to people.

- For [income\( sale\)](#)
- For making perfume
- Some flowers are eaten.
- For [making insecticide](#)

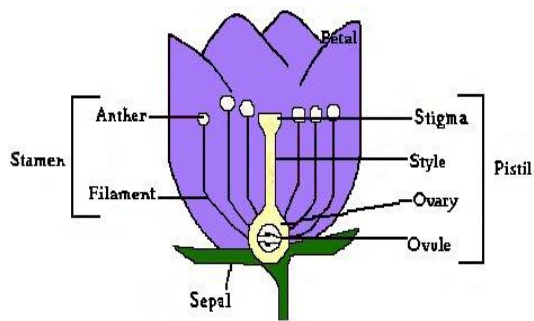
### Use of flowers to other animals.

[Bees get nectar from flowers for making honey.](#)

[Sunbird feed on nectar.](#)

[Mosquitoes feed on nectar.](#)

### The structure of a flower:



### Functions of each part:

**Flower stalk:** holds the flower onto the stem.

**Sepals:** protect the flower when it is still young (bud stage).

They make food for the plant since they have chlorophyll.

**Petals:** they are brightly coloured to attract pollinators.

**Ovary;** develops into a fruit after fertilization.

- It protects the ovules.

**Ovules:** develop into seeds after fertilization.

**Anther head:** produces pollen grains.

**Stigma:** receives pollen grains.

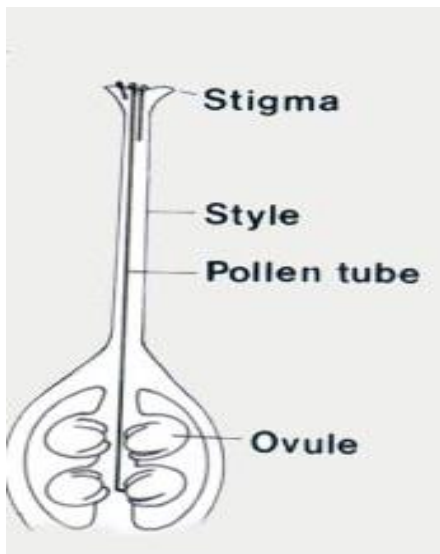
**Style:** holds the stigma in position.

**Filament:** holds the anther head in position.

### Pistil:

This is the female part of a flower.

It is made up of ; stigma, style, ovary and ovules.



### Stamen:

This is the male part of a flower.

It is made up of the anther head and the filament.





**NB:** - A general name given to a group of sepals is called calyx.  
 -A general name given to a group of petals is called corolla.

Activity;

1. Name the reproductive part of a flowering plant.
2. What name is given to a female part of a flower?
3. How is important is a stigma in a flower?

## Week three lesson six.

### **Pollination:**

It is the transfer of pollen grains from the anthers to the stigma of a flower.

### **Types of pollination:**

- Self pollination
- Cross pollination

### **Self pollination;**

It is the transfer of pollen grains from the anthers to the stigma on the same flower.

### **Movement of pollen grains in self pollination**



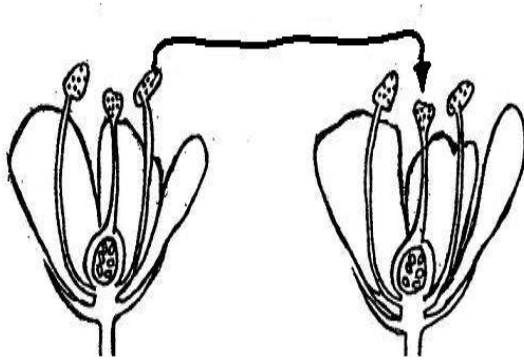
### **Plants which carry out self pollination:**

- Tomato plant
- Wild magrigold

### **Cross pollination:**

It is the transfer of pollen grains from the anthers of one flower to the stigma

of another flower but of the same kind.



**Plants which carry out cross pollination:**

- Maize plant.
- Coco nut plant.
- Pawpaw plant.
- Cow pea plant.
- Passion fruit plant.

**Difference between self and cross pollinated flowers:**

<b>Self pollinated</b>	<b>Cross pollinated</b>
-filaments are longer than styles	-Styles longer than filaments
-Pistils and stamen On same flower	-Pistils and stamens on different flowers
-Produce large amounts of pollen grains	-Produce small amounts of pollen grains.
-Anthers higher than stigmas	-Stigmas higher than anthers

**Activity;**

1. Briefly explain the term pollination.
2. Name the two types of pollination.
3. In the space below draw correctly the diagram of self pollination.

**Week three lesson seven.**

**Agents of pollination:**

An agent of pollination is anything that carries pollen grains from the anthers to the stigma.

**Some agents of pollination:**

- Insects like bees, butterflies, moths, beetles.
- Birds like sunbirds, humming birds.
- Wind
- Animals like man.

**Difference between wind and insect pollinated flowers.**

<b>Insect pollinated</b>	<b>Wind pollinated</b>
Have brightly coloured petals	Have dull coloured petals
Have large petals	Have small petals
Produce scent	Produce no scent
Produce nectar	Produce no nectar
Produce few pollen grains	Produce a lot of pollen grains
Have sticky stigma	Have hairy stigma
Have heavier pollen	Have lighter pollen grains

#### **Changes which occur after fertilization:**

- Ovules develop into seeds.
- Ovary develops into a fruit.
- Petals dry and fall off.

#### **Activity;**

1. State two agents of pollination
2. Give any one characteristic of ;
  - a)insect pollinated flowers
  - b)wind pollinated flowers
3. what happens to the ovules after fertilization?

## **Week four lesson one and two.**

### **Seeds.**

A seed is a developed fertilized ovule.

A seed is a mature fertilized ovule

### **Types of seeds:**

- **Monocotyledonous seeds.**
- **Dicotyledonous seeds.**

**Mono - means one**

**Di - means two**

**Monocotyledonous seeds( plant)**

**These are seeds with one cotyledon.**

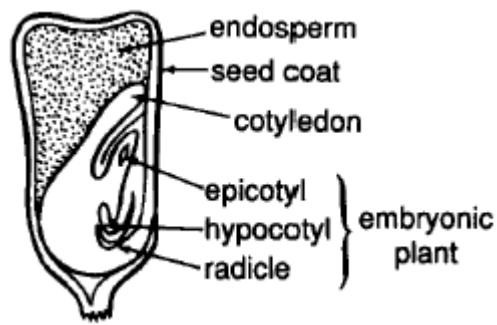
**Examples include:**

- **Rice seeds**
- **Millet.**
- **Sorghum**
- **Wheat**
- **Maize**
- **Oats**
- **Barley**

**Characteristics of monocotyledonous seeds (plants).**

- **They have one cotyledon.**
- **They store food in the endosperm.**
- **They undergo hypogeal germination.**
- **They plants have parallel leaf venation.**
- **They have fibrous root system.**

#### **Internal parts of a maize grain:**



**Functions of each part;**

**Endosperm:** stores food for the grain.

**Cotyledon;** suck food from the endosperm to the embryo.

**Plumule sheath:** protects the Plumule.

**Plumule;** develops into a shoot system.

**Radicle sheath:** protects the Radicle.

**Radicle:** develops into a root system.

**Embryo:** this is made up of the Plumule and Radicle.

It develops into a new plant.

**Testa (seed coat):** protects the inside parts of the grain.

**Activity;**

1. Briefly explain the term a seed.
2. Give any one type of a seed
3. How is a cotyledon important in a maize grain?

## Week four lesson **three and four.**

**Dicotyledonous seeds (plant)**

These are seeds with two cotyledons.

**Examples of dicotyledonous seeds:**

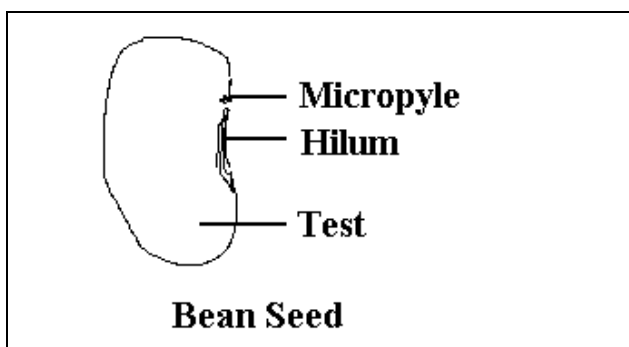
- Coffee
- Beans
- Soya
- groundnuts
- [simsim](#)
- [avocado](#)
- [oranges](#)
- [mangoes](#)
- [tomatoes](#)
- 

**Characteristics of dicotyledonous seeds:**

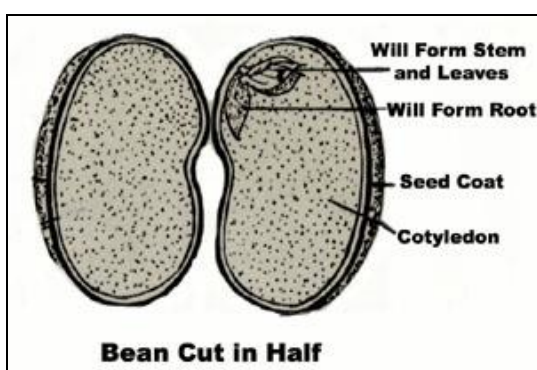
- They have two cotyledons
- They have tap root system
- They store food in the cotyledon

- They have network leaf venation
- They undergo epigeal germination

### External parts of a bean seed:



### Internal parts of a bean seed:



### Functions of each part:

**Cotyledons:** store food for the embryo.

**Testa/ seed coat:** protects the inside parts of a seed.

**Radicle:** develops into the root system.

**Plumule:** develops into the shoot system.

**Embryo:** grows into a new plant. The embryo is made up of the radical and Plumule

**Scar/ Hilum:** it is where the seed is attached to the pod.

### Activity;

1. Give any one characteristic of dicotyledonous seeds.
2. Where does a dicotyledonous seeds store there food?
3. How important is a Testa in a been seed

## Week four lesson three and four.

### Seed germination:

- It is the growing of a seed into a seedling.
- A seedling is a young plant.

### Conditions for germination:

- Water
- Warmth
- Oxygen

**Importance of each condition;**

**Water:** -it softens the testa for the embryo to pass.

-water dissolves the stored food in the cotyledon.

**Oxygen:** it is used for respiration.

**Warmth:** provides the right temperature for germination.

**The process of germination:**

- Water enters the seed through the micropyle.
- The testa softens and allows the radical to pass through.
- The cotyledon can either remain in the ground or come out of the ground according to the type of germination.

**Types of germination:**

- Epigeal germination.
- Hypogeal germination.

**Epigeal germination;**

The type of germination where the cotyledons come out of the ground/ soil.

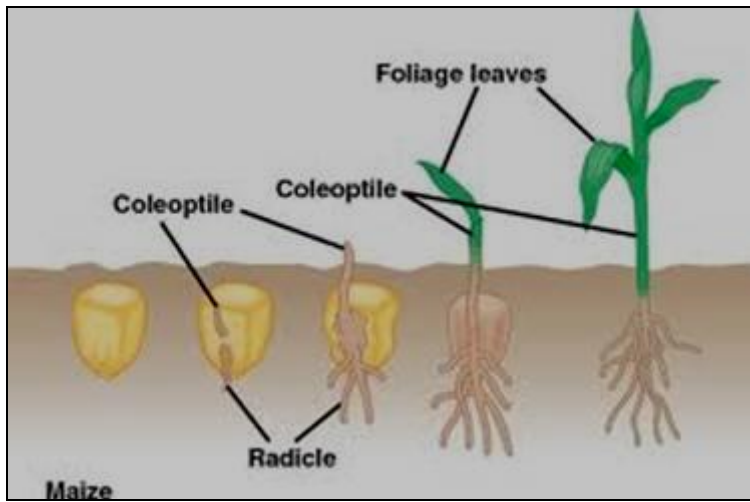


**Plants with epigeal germination:**

- Bean plant
- Soya plant
- Pea plant
- Groundnut plant

**Hypogeal germination:**

It is the type of germination where the cotyledon remains in the soil.



#### **Plants with hypogeal germination:**

- Maize plant
- Wheat plant
- Sorghum plant
- Millet plant
- Oat plant

#### **Activity;**

1. In one sentence write the meaning of the term germination.
2. Mention one condition for the seed to germinate.
3. Which type of germination is seen in a maize grain?

### **Week four lesson five.**

#### **Uses of seeds to people and other animals:**

- Some seeds are eaten
- Some are sold
- For feeding poultry
- For decoration
- For planting.

#### **Topical questions**

### **Week four lesson six and seven.**

#### **GROWING CROPS**

##### **Types of crops**

1. Cereals
2. Legumes

3. Root crops
4. Fruit crops
5. Vegetables
6. Plantation crops

## **Cereals**

### **Examples**

1. Maize
2. Millet
3. Rice
4. Sorghum
5. Wheat
6. Oats

## **Legumes**

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

### **Examples**

1. Beans
2. Peas
3. Soya beans

Legumes have root nodules that keep nitrogen fixing bacteria.  
Legumes make the soil fertile.

## **Root crops**

They are      i) Root tubers  
                  ii) Stem tubers

### **Root tubers**

These are plants which store food in swollen underground roots.

#### **Examples**

1. Cassava
2. Sweet potatoes
3. Carrots
4. Yams

### **Stem tubers**

These are plants which store their food in swollen underground stems.

#### **Examples**

1. Cocoyam
2. Irish potatoes

## **Fruit crop**

A fruit is a well developed fertilized ovary.

### **Examples of fruit crops**

1. Jackfruit
2. Mango
3. Oranges



4. Pineapple
5. Apple
6. Bananas
7. Avocado
8. Grapes
9. Guavas
10. Pawpaw

## **Vegetable crops**

### **Types of vegetable crops**

**Leafy vegetables:** are vegetables whose leaves are eaten.

#### **Examples**

1. Cabbage
2. Spinach
3. Amaranthus (dodo)
4. Bbuga

**Fruit vegetables:** are vegetables whose fruits are eaten.

#### **Examples**

1. Tomatoes
2. Egg plants
3. Pepper
4. Bitter berries (Sodom's apple)

**Root vegetables:** are vegetables whose roots are eaten.

#### **Examples**

1. Carrots

## **Plantation crops**

#### **Examples**

1. Coffee
2. Cocoa
3. Tea
4. Cotton

### **Activity;**

1. Write down any one type of crop.
2. Give any one example of a leguminous crop.
3. Why are root nodules important in a leguminous plant?

## **Week six lesson one.**

### **Groups of crops**

There are three groups of crops namely;

1. Annual crops
2. Perennial crops
3. Bi-annual crops.

### **Annual crops**

These are crops that grow and die within a year.

### Examples

1. Maize
2. Sorghum
3. Peas
4. Ground nuts
5. Cassava
6. Beans
7. Tomatoes
8. Cabbage
9. Spinach

### Perennial crops:

Crops that last for many years

### Examples



1. Coffee
2. Tea
3. Cocoa
4. Bananas








### Activity;








1. Briefly explain the following;
  - i) Annual crops
  - ii) Perennial crops.
2. Give any two examples of annual crops.

## Week six lessen two and three

### Garden tools

	GARDEN TOOL	USE
1	 Hoe	<ul style="list-style-type: none"><li>· Digging</li><li>· Planting</li><li>· Weeding</li><li>· Harvesting</li></ul>
2	 Spade	<ul style="list-style-type: none"><li>· Mixing manure</li><li>· Lifting soil</li></ul>

3	 Rake	<ul style="list-style-type: none"> <li>· Leveling soil</li> <li>· Collecting weeds</li> </ul>
4	 Wheel burrow	<ul style="list-style-type: none"> <li>· Carrying soil</li> <li>· Carrying manure</li> <li>· Carrying harvest</li> </ul>
5	 Slasher	<ul style="list-style-type: none"> <li>· Cutting grass</li> <li>· Cutting weeds</li> </ul>
6	 Axe	<ul style="list-style-type: none"> <li>· Cutting big trees</li> <li>· Chopping wood</li> </ul>
7	 Panga	<ul style="list-style-type: none"> <li>· Cutting small branches</li> <li>· Cutting trees</li> <li>· Harvesting sugar cane</li> </ul>
8	 Forked hoe	<ul style="list-style-type: none"> <li>· Digging hard ground</li> <li>· Digging stony ground</li> </ul>
9	 Watering can	<ul style="list-style-type: none"> <li>· Watering crops</li> <li>· Watering seedlings</li> </ul>
10	 Garden fork	<ul style="list-style-type: none"> <li>· Mixing manure</li> </ul>

11	 <p>Shovel</p>	<ul style="list-style-type: none"> <li>· Transplanting</li> <li>· Carrying seedlings</li> </ul>
12	 <p>Pick axe</p>	<ul style="list-style-type: none"> <li>· Digging in rocky ground</li> <li>· Digging in stony soils</li> </ul>
13	 <p>Secateur</p>	<ul style="list-style-type: none"> <li>· Pruning crops</li> </ul>
14	<p>Pruner</p>	<ul style="list-style-type: none"> <li>· Pruning crops</li> </ul>
15	 <p>Hand fork</p>	<ul style="list-style-type: none"> <li>· Light weeding</li> <li>· Removing seedlings from soil</li> </ul>
16	 <p>Sprayer</p>	<ul style="list-style-type: none"> <li>· Spraying crops</li> </ul>
17	 <p>Knives</p>	<ul style="list-style-type: none"> <li>· Harvesting</li> <li>· Pruning</li> <li>· Peeling</li> </ul>
18	 <p>Tape measure</p>	<ul style="list-style-type: none"> <li>· Spacing crops in the garden</li> </ul>

#### Care for garden tools.

- Keeping in cool dry places.
- Replacing broken handles.
- Cleaning after use.
- Sharpening cutting tools.

**Preventing garden tools from rusting.**

- Keeping in cool dry places.
- Painting metallic tools.
- Greasing metallic tools.

**Conditions needed for rusting:**

- Moisture
- Oxygen.

**Effects of rusting on garden tools.**

- It weakens garden tools.
- It makes cutting tools blunt.

**Advantage of rusting to a farmer:**

- It increases mineral salts in the soil.

**Activity;**

1. Name any two garden tools apart from a trowel.
2. Why is it important to paint garden tools?
3. How is a trowel useful to a farmer?

## **Week six lesson four.**

**Nursery bed**

A nursery bed is a small garden where seedlings are grown before they are transplanted.

**Importance of a nursery bed**

1. It gives a farmer time to prepare the main garden.
2. It protects seedlings from heavy rain drops.
3. It protects seedlings from strong sunshine.
4. It helps farmers to select healthy seedlings.

**Examples of plants grown in a nursery bed.**

1. Tomatoes
2. Coffee
3. Onions
4. Passion fruits.

**Transplanting**

Transplanting is the transfer of seedlings from a nursery bed to the main garden.

Transplanting is always done in the evening.

**Why seedlings should be transplanted in the evening.**

1. It prevents wilting of the seedlings.
2. There is little loss of water from the soil through evaporation.

## **Garden tool used for transplanting**



### **Gap filling**

The planting of seeds or seedlings where they did not germinate in the garden.

### **Activity;**

1. The transfer of seedlings from nursery bed to a main garden is known as-----.
2. State nay two importance of a nursery bed.
3. Why are farmers advised to carry out transplanting in the evening?

## **Week six lesson five and six.**

### **Land preparation**

It is done in the dry season to;

- Prevent the weeds from germinating again after digging and ploughing.
- Avoid the soil from sticking onto the hoe or plough

### **Ways of preparing land**

- Digging
- Ploughing
- Slashing/clearing
- Cutting big trees
- Harrowing
- De-trashing

### **Garden tools / implements used in preparing land**

- Hoes
- Ox ploughs
- Tractors
- Slashers
- Rakes
- Panga
- Axe

### **Importance of preparing land**

1. To soften the soil

2. Digging and ploughing allows water into the soil.
3. It makes planting easy.
4. Digging and ploughing allows air into the soil.
5. Cutting away big trees opens space for crops to get enough sunlight.

## **2) Selecting viable planting materials**

### **a) Examples of planting materials**

1. Seeds
2. Suckers eg bananas, sisal, pineapple
3. Stem cuttings eg cassava potatoes sugar cane
4. Bulbs e.g. onions and garlic
5. Leaves eg bryophyllum
6. Crown eg pineapple
7. Slips eg pineapple
8. Rhizomes eg ginger

### **b) Quality of good planting materials.**

1. They should be mature.
2. They should not be damaged.
3. They should be free from pests.
4. They should be free from diseases.
5. They should not be too old.
6. They should be of the same variety.

### **Importance of selecting planting materials.**

1. It prevents wastage of land
2. It ensures quality plants.
3. It prevents wastage of time.
4. It prevents wastage of labour

### **Planting and sowing**

- This is the putting of planting materials in the soil to germinate.
- Planting is done during wet/rainy season.

### **Reasons for planting crops in wet season.**

- There is enough water for seed germination.
- The soil is soft for easy growth of roots.

### **Activity;**

1. Why do farmers plant their crops during the wet season?
2. Mention any two qualities of a good planting material
3. Give any one example of a planting material.

## **Week six lesson seven .**

### **Row planting**

This is when planting materials are put in the soil in lines.

### **Illustration**



### **Advantages of row planting**

- It makes it weeding easy.
- It makes harvesting easy.
- It controls the easy spread of pests and diseases.
- It avoids wastage of seeds and other planting materials.
- It allows proper spacing of crops.

### **Disadvantages of row planting**

- It needs a lot of labour.
- It is time consuming.

### **Examples of plants planted by row planting.**

- Maize
- Cassava
- Beans
- Pineapples
- Potatoes.

### **Broad casting method**

This is the putting of seeds in the soil while scattering them.



### **Advantages of broadcasting methods**

1. It saves time.
2. It does not need a lot of labour.
3. It does not waste nutrients in soil.

### **Disadvantages broadcasting method.**

1. It makes weeding difficult.
2. It makes harvesting difficult.
3. Pests and diseases can easily spread.

### **Activity;**

1. **Mention any one method of planting crops.**
2. **Suggest any one advantage of broadcasting method of planting crops.**
3. **Give any tools used in row planting.**



# Week seven lesson one.

## Crop growing practices:

### Caring for crops

These are ways in which farmers care for their crops in the garden

1. Thinning
2. Watering
3. Weeding
4. Manuring
5. Applying fertilizers
6. Staking
7. Mulching
8. Providing shade
9. Pruning
10. Gap filling
11. Spraying
12. Crop rotation
13. Harvesting

### Thinning

The removal of excess seedlings from a planting hole or nursery bed.

### Importance of thinning

1. Reduces competition for sunlight, nutrients, space and water

### Watering

The providing of water to crops or seedlings during the dry season or soon after transplanting

### Importance of water to plants

1. For seed germination
2. For making food
3. For dissolving nutrients for roots to taken in

**Activity: Draw the** garden tool for watering crops.



## **Week seven lesson two.**

### **Weeding**

It is the removal of unwanted plants from the garden.

### **A weed**

A weed is an unwanted plant in a garden.

### **Examples of weeds**

1. Spear grass
2. Elephant grass
3. Black jack
4. Star grass
5. Wandering Jew
6. Couch grass
7. Guinea grass
8. Star grass

**Activity:** Draw a garden tool for weeding



### **Dangers of weeds in a garden**

1. They compete for light, water, nutrients and space with the crops.
2. They encourage easy spread of pests.
3. They encourage easy spreads of crop diseases.
4. They make harvesting difficult

### **Ways of controlling weeds**

1. Slashing
2. Spraying /using herbicides
3. Uprooting
4. Crop rotation
5. Mulching
6. Digging

### **Advantages of weeding a garden**

1. It reduces the competition for light, nutrients, water and space in the garden.
2. It makes harvesting easy.
3. It controls the easy spread of pests.
4. It prevents the easy spread of crop diseases.

### **Uses of weeds to people**

1. Some weeds are used as mulches
2. Some weeds are used as herbal medicine.

3. Some weeds are used to feed animals like cattle e.g. elephant grass.

**Activity;**

1. Briefly explain the term a weed?
2. How are weeds important to people?
3. Suggest any two advantages of weeding a garden.

## **Week seven lesson three and four.**

### **Manuring**

It is the putting of fertilizers in the soil to make it more fertile.

#### **Sources of manure**

- Animal dung and urine
- Plant remains
- Green plants

#### **Types of manure (natural fertilizers)**

##### **Compost manure**

It is got from plant materials and animal wastes.

##### **Green manure**

It is got from ploughed buried and rotten green materials like legumes.

##### **Farm yard manure**

It is got from farm animal wastes, urine and decayed material.

#### **Organic mulches**

It is got through mulching using dry plant materials.

##### **Mulching**

- Mulching is the covering of top soil with dry plant materials.
- Mulches are plant materials used for mulching.

#### **Examples of mulches**

- Elephant grass
- Coffee husks
- Banana leaves
- Chopped stems of bananas

#### **Advantages of mulching**

- It keeps water (moisture) in the soil.
- It controls soil erosion.
- It makes the soil fertile.
- It controls the rapid growth of weeds.

#### **Disadvantages of mulching**

- Mulching keeps pests
- Some mulches can grow into weeds
- Mulching is a fire hazard
- It is tiresome

### **Pruning**

Pruning is the removal of unwanted parts from a plant.

**Advantages of pruning**

- It reduces the easy spread of crop diseases.
- It reduces competition for sunlight, water, nutrients and air.
- It improves on crop yields.

**Activity:** Draw the garden tool used for pruning

**Thinning**

It is the removal of excess plants in the garden/nursery bed.

**Advantages of thinning**

- It reduces competition for crop nutrients.
- It reduces the easy spread of pests
- It reduces the spread of crop diseases.
- It improves on crop yields.

**Activity;**

1. Name any one source of manure in our environment.
2. Give any two advantages of mulching.
3. What do you understand by the term thinning?

**Week seven lesson five.****Control of pests**

A pest is an animal that destroys crops.

**Examples of crop pests**

- Army worms
- Birds
- Rats
- Termites
- Maize stalk bore
- Locusts
- Squirrels
- Aphids
- Cotton stainer
- Snails
- Banana weevil
- Maize weevil

**Dangers of pests to crops**

- They weaken plants
- They lead to low produce
- They lead to poor growth of crops
- They destroy crops
- Some spread crop diseases.

### **Ways of controlling crop pests**

- Spraying pesticides
- Using scare crows
- By crop rotation
- Planting pest free materials
- Regular weeding
- Uprooting and burning infected crops
- Proper spacing

### **CROP DISEASES**

#### **Some crop diseases**

- Cassava mosaic
- Leaf rot
- Tomato blight
- Leaf curling
- Groundnut Rosette
- Leaf spot
- Maize streak

#### **Ways of controlling crop diseases**

- By crop rotation
- Spraying chemicals
- Uprooting and burning of infected crops
- Planting healthy materials.
- Proper spacing
- Early planting

#### **Activity;**

1. Briefly explain the term a pest.
2. Give any two examples of crop pests.
3. Suggest any two ways farmers can control pests in their gardens.
4. Mention any one crop disease you know.

## **Week seven lesson six.**

### **Crop rotation**

It is the growing of different types of crops on the same piece of land seasonally.

#### **Advantages of crop rotation**

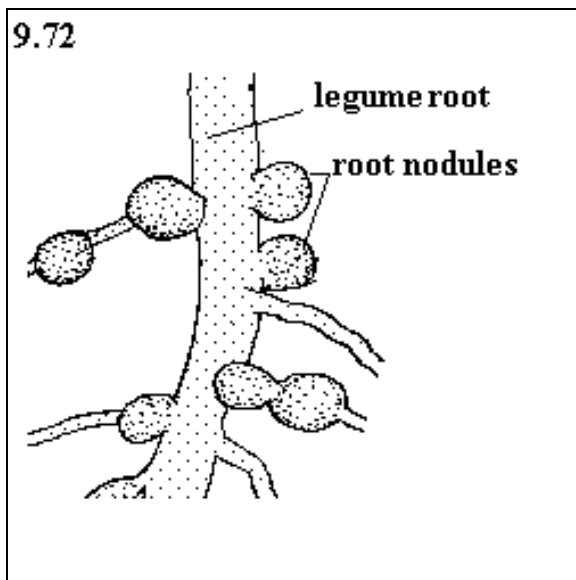
- Keeps the soil fertile
- Controls soil erosion
- Controls crop pests
- Controls crop diseases

- N.B.** 1) Legumes are alternated with non-leguminous plants.  
Why? Because they make soil more fertile since legumes add Nitrogen to the soil.

Leguminous plants have root nodules which keep Nitrogen fixing bacteria.

- 2) Shallow rooters are alternated with deep rooters.  
Why? This balances the use of nutrients from soil at different levels.

### Structure of the root system of a leguminous plant



## Week seven lesson seven.




### Harvesting.

It is the collecting of ready (mature) crops from the garden

It is done during the dry season for easy drying of harvesting crops.

### Some garden tools used for harvesting

TOOL	PURPOSE
------	---------

 Sickle	A sickle is used for harvesting cereal crops.
 Hoe	A hoe is used for harvesting root crops.
 Panga	A panga is used for harvesting sugar cane, bananas.

### Methods of harvesting crops

1. Hand picking (e.g. coffee, oranges, etc)
2. Cutting stems (e.g. sugar cane, bananas)
3. Uprooting (e.g. ground nuts, cassava)
4. Digging (e.g. potatoes)

### Storing of food

Food storage is the keeping of food safely for future use.

### Reasons why farmers store food

1. To be eaten in dry season
2. For planting in next season
3. To be sold when market prices are better.

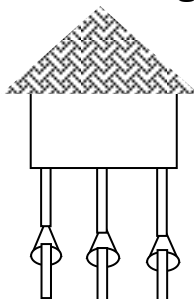
### Places where food can be stored

1. In granaries
2. In silos
3. In refrigerators / freezers

### Qualities of a good store

1. It should be well ventilated
2. The roof should be leak proof
3. It should have rat guards
4. It should be clean and dry.

### A diagram showing a granary



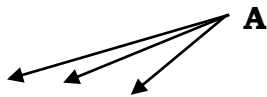
### N.B.

1. Rat guards prevent rats from entering the store.
2. Leak proof roof prevents damping and rotting of the seeds.

### Exercise:

Name and give the use of the labeled parts.

Give two dangers of storing grains in a wet food store.



#### Activity;

1. In one sentence write down the meaning of crop rotation.
2. Mention any two advantages of crop rotation.
3. Briefly explain the term harvesting.
4. Mention any two methods of harvesting crops.
5. Give two reasons why farmers store their food.
6. Name any two places where farmers store their crops.
7. Give any two qualities of a good store.

### Week eight lesson one.

#### Topical questions.

1. How is transpiration important in the environment?
2. State the gas given off during germination.
3. How is chlorophyll useful during photosynthesis?
4. How are flowers important to plants?
5. Why is a maize grain said to be a seed?
6. Draw a bean seed and show the testa.
7. How many cotyledons does a monocotyledonous seed have?
8. How are legumes important in crop rotation?
9. How is the endosperm different from the cotyledon in a maize grain?
10. Write down one example of the following:
  - a. Cereal crops
  - b. Monocotyledonous seeds
  - c. Dicotyledonous seeds
  - d. Leguminous seeds
11. How are the following parts useful in a flower?
  - a. Petals
  - b. Sepals
  - c. Nectarines
12. Draw a pistil and show all its parts.
13. Why are petals of a flower brightly coloured?
14. How are roots important to plants?
15. State any two uses of leaves to plants.
16. Mention any one function of stems to a plant.
17. Briefly explain the term pollination.
18. Suggest any one agent of pollination.
19. Draw a diagram showing the following types of germination:
  - a. Epigeal germination
  - b. Hypogeal germination.

### Week eight lesson two and three.



## WEATHER CHANGES

- Weather is the state of the atmosphere at a given place.
- It is also the condition of the atmosphere at a given time [at a particular place](#).

### 2. Elements/ factors of weather


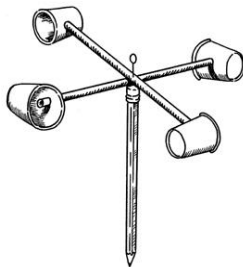

- Sunshine
- Temperature
- Cloud cover
- Rainfall
- Wind movements
- Humidity

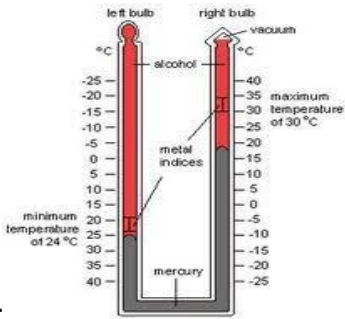

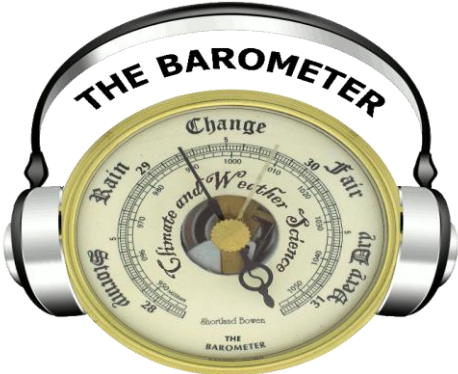

### 3. Types of weather

- Cloudy weather
- Rainy weather
- Sunny weather
- Windy weather

### 4. Weather instruments

These are instruments used to measure different elements of weather.

WEATHER INSTRUMENT	USE
Rain gauge 	Measures the amount of rainfall received in a given place.
Anemometer 	Measures the speed of wind.
Wind vane 	Shows the direction of wind.
Six's	Measures the maximum and minimum temperatures of the day.

<p>thermometer</p>	
<p>Wind sock</p>  <p>www.shutterstock.com - 35173753</p>	<p>Shows the direction of wind.</p>
<p>Barometer</p> 	<p>Measures atmospheric air pressure.</p>
<p>Hygrometer</p> 	<p>Measures the humidity in the atmosphere</p>

### Activity

1. Give the meaning of weather.
2. State any one element of weather.
3. Which factor gives a clear sign of rain?

## Week eight lesson four.

### Sources of water

**a. Natural sources of water**

- i. Rivers
- ii. Swamps
- iii. Lakes
- iv. Rainfall

**b. Artificial sources of water**

- i. Taps
- ii. Tanks
- iii. Bore holes
- iv. Wells

**2. Properties of water**

- i. It has no colour
- ii. It has no taste
- iii. It has no smell
- iv. It takes the shape of the container
- v. water dissolve gasses
- vi. water boils at 100°C
- vii. water freezes at 0°C

**Uses of water in soil**

- It makes the soil soft for roots to grow easily.
- It is used for seed germination.
- Plants use water to make food.
- It softens the ground for easy weeding.
- Cools the plants during transpiration.
- It dissolves nutrients in the soil for roots to absorb.

**Uses of water to people and other animals.**

- **Used for cooking**
- **For drinking**
- **For washing cloths**
- **For watering crops**
- **Water is a habitat for water animals.**

**Uses of water to plants.**

- **It is used for germination**
- **For photosynthesis**
- **For transpiration**
- **It dissolves mineral salts.**

**3. Water in air**

This is called water vapour

**Formation of water vapour**

- i. Through evaporation from water bodies
- ii. Through transpiration from plants

### **Importance of water vapour**

- i. It changes into clouds on condensation which results in rain

### **4. Rain**

The rain drops that fall down from the clouds in the sky.

#### **Rainfall**

The water collected on the ground from the rain drops

#### **Activity**

1. Point out the any one natural source of water in environment.
2. Give one property of water.
3. Name the natural main source of water.

## **Week eight lesson five.**

### **The water cycle**

This is the process by which rain is formed.

#### **It involves**

- i. Evaporation
- ii. Transpiration
- iii. Condensation

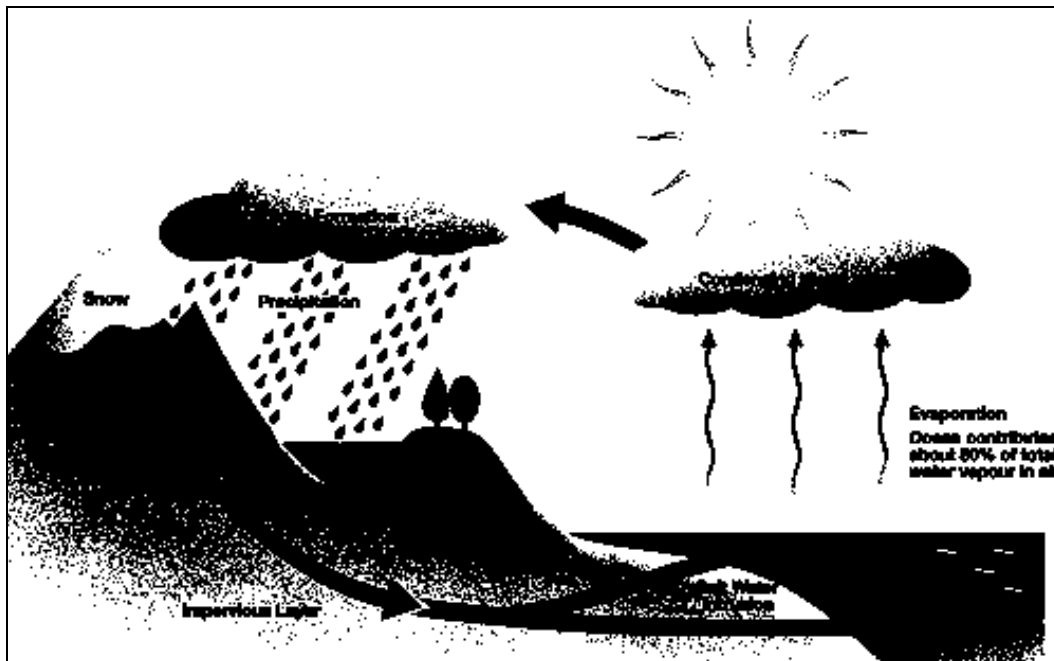
**Evaporation** is the change of water from liquid to gas.

**Transpiration** is the loss of water from a plant to the atmosphere through leaves as vapour.

**Condensation** is the change of state from gas to liquid.

#### **During the water cycle;**

- i. The sun heats the water bodies and vegetation
- ii. Evaporation takes place from the water bodies and transpiration takes place in plants
- iii. The water vapour rises up into the sky and condenses to form clouds
- iv. The clouds become heavy and fall down as rain.



- A—Heat from the sun
- B—Evaporation from water bodies
- C—Transpiration from vegetation
- D—Condensation forming clouds
- E—Rain

### Activity;

1. In one line give the meaning of water cycle.
2. How important is the sun during the rain formation.
3. Name any two processes that take place during the rain formation.

## Week eight lesson six.

### Clouds

Clouds are formed when water vapour in the sky condenses.

### Types of clouds

- i. Cirrus—highest and lightest clouds
- ii. Stratus
- iii. Cumulus
- iv. Nimbus—heaviest clouds

### Effects of clouds on the environment

- i. Clouds block direct sunlight  
This reduces the brightness in our environment.
- ii. Clouds lower the temperature in our environment by reducing heat from the sun.
- iii. Clouds bring rain.

### Effects of rain on the environment

- i. Rain reduces temperature in the environment
- ii. Rain reduces dust

iii. Rainfall softens soil.

### **Wind.**

Wind is moving air.

wind is air in motion

### **Effects of wind in the environment:**

- Strong wind is an agent of soil erosion.
- Strong wind breaks down crops and trees.
- Strong wind blows off roofs of houses.
- Wind is an agent of pollination.
- Wind is an agent of seed dispersal.

### **Uses of wind to people and plants:**

- Used for sailing engineless boats.
- For generating electricity.
- For flying kites'
- For winnowing.
- Plants use wind for pollination.
- For seed dispersal.

### **Uses of sunshine in the environment.**

- For drying harvests.
- For warmth'
- For solar electricity.

### **Effects of sunshine in the environment:**

- Strong sunshine dries up water bodies.
- Strong sunshine dries up plants in the garden.
- Strong sunshine dries and hardens the soil.

### **Temperature:**

- Temperature is the hotness or coldness of an object or place.
- The instruments used for measuring temperature are:
  - . Six thermometers for measuring the highest and the lowest temperature of the day.
  - . Clinical thermometer for measuring human body temperature.
- Temperature is measured in degrees.

### **Activity;**

1. Name any two types of clouds.
2. How are clouds formed?
3. Mention any two effects of ;
  - a) Sunshine
  - b) Rain
  - c) Wind in the environment.

### **The elements of weather**

- i. temperature
- ii. humidity is the a mount of water vapour in atmosphere
- iii. air pressure
- iv. wind
- v. rainfall
- vi. cloud cover

**vii. sunshine**

**Examples of a weather chart**

<b>Element of weather</b>	<b>Temperature</b>	<b>Cloud cover</b>	<b>Rainfall</b>	<b>Cloud cover</b>	<b>Wind movement</b>	<b>Sunshine</b>
MON.						
TUE.						
WED.						
THUR.						
FRI.						

**Week eight lesson seven**

**TOPICAL QUESTIONS**

**1. Briefly explain the term weather.**

**2. Mention four elements of weather.**

- |     |      |
|-----|------|
| i)  | iii) |
| ii) | iv)  |

**3. Identify four types of weather.**

- |     |      |
|-----|------|
| i)  | iii) |
| ii) | iv)  |

**4. Match the items in A with those in B.**

- |                   |                                      |
|-------------------|--------------------------------------|
| <b>A</b>          | <b>B</b>                             |
| Thermometer       | Day's highest and lowest temperature |
| Barometer         | Rainfall                             |
| Six's thermometer | Temperature                          |
| Rain gauge        | Air pressure                         |
| Anemometer        | Speed of wind                        |

**5. How do people manage the following changes in their environment?**

- Strong wind
- High temperatures

- c) Very low temperatures
- d) Flooding

**6. Name two examples of each water source below;**

**a) Natural sources of water**

i)

ii)

**b) Artificial sources of water**

i)

ii)

**7. Mention two properties of water**

i)

ii)

**8. Describe, in four sentences, how rain is formed.**

9. How do the following affect temperature in the environment?

a) Clouds

b) Rain

## **WEEK NINE LESSON ONE**

### **PERSONAL HYGIENE**

1. Personal hygiene is the way we keep our bodies clean.  
It is the general cleanliness of the body.

**2. Importance of personal hygiene.**

- i. It controls the spread of germs.
- ii. It prevents bad body smell.
- iii. It prevents skin diseases
- iv. It prevents teeth diseases
- v. It prevents lice, mites and ticks.

## **WEEK NINE LESSON TWO**

**3. Ways of keeping good personal hygiene.**

- i. Bathing every day
- ii. Cutting finger and toe nails short
- iii. Brushing teeth every day
- iv. Washing hands after visiting the toilet or latrines.
- v. Washing hands after a physical task like digging, picking rubbish, etc.
- vi. Washing hands before eating food.
- vii. Washing clothes regularly
- viii. Washing beddings regularly
- ix. Combing hair daily.
- x. Ironing clothes and beddings.

**4. Items used to keep the body clean**

- i. Soap
- ii. Clean water
- iii. Sponge
- iv. Tooth brush



- v. Comb
- vi. Towel
- vii) Razor blade
- ix) Sandals
- x) Tooth paste

## WEEK NINE LESSON THREE

### 5. Dangers of poor personal hygiene.

- i. The body smells bad.
- ii. Jiggers, mites, ticks and lice can breed and affect the body.
- iii. The teeth may develop tooth decay.
- iv. Diarrhea diseases can spread easily.
- v. Accidental injuries from long finger nails to self or others.

### 6. Diseases brought by poor personal hygiene.

DISEASES	CAUSE
Tooth decay	Bacterial
Scabies	Itch mite
Dysentery	Bacteria Amoeba
Diarrhoea	Virus Bacteria
Ring worm	Fungus
Trachoma	Chlamydia

### ACTIVITY

1. Name any two items a pupil in primary four can do to clean her/himself.
2. What is the danger of poor personal hygiene to an individual?
3. Give any one disease a P.4 child can get due to poor personal hygiene.
4. How do we call the act of keeping oneself clean?
5. Suggest one way of keeping your body clean.
6. Give any two values of maintaining good personal hygiene.

## WEEK SEVEN LESSON SEVEN

### TOPICAL QUESTIONS

1. Briefly explain personal hygiene.
2. Name four items used in keeping good personal hygiene.

- |     |      |
|-----|------|
| i)  | iii) |
| ii) | iv)  |

3. Why is it important to keep good personal hygiene?

- |     |      |
|-----|------|
| i)  | iii) |
| ii) | iv)  |

4. State four ways of keeping personal hygiene.

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

5. Name the diseases that affect the following parts of the body.

- a) eyes
- b) skin
- c) teeth

6. Suggest four ways of keeping good personal hygiene.

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

7. Why are the following habits important to an individual.

- a) Cutting finger nails
- b) Combing hair
- c) Washing hands before eating
- d) Washing hands after using a toilet or latrine.