**TOPICAL BREAKDOWN SCIENCE P.4 TERM ONE 2024**

**THEME: THE WORLD OF LIVINGTHINGS**

**TOPIC: PLANT LIFE**

-Plants and animals

-Flowering plants

-Non flowering plants

-Examples of flowering plants

-Parts of a flowering plant

-Functions of each part

-Systems of a flowering plant

-Main parts of a flowering plant

-**LEAVES**

-Structure

-Uses of leaves

-Types of leaves

-Leaf venation

-Processes in leaves

-Photosynthesis

-Transpiration

**-STEMS**

-Types of stems

-Functions of the stem

-Ways how weak stems climb others

-ROOTS

-Describe roots

-Functions of roots Types of roots

-FLOWERS

-The structure of a flower

-Functions of parts of a flower

-Uses of a flower to man and plants

-Pollination

-Types of pollination

-Agents of pollination

-Characteristics of wind and insect pollinated flowers

-Fertilization

-Where fertilization takes place in a flower

-Reproductive parts of a flower

-Pistil

-Stamen

-Seeds

-Structures of seeds

-Types or classes or groups of seeds

-Functions of seeds

-Germination

-Types of germination

-Conditions necessary for germination

-Tropism

-Types of tropism

**TOPIC: GROWING CROPS**

-Common crops grown

-Garden tools

-Crop growing practices

-Pests and diseases

**TOPIC: WEATHER CHANGES AROUND US**

-Weather elements

-Types of weather

-Weather instruments

-Importance of weather instruments

-Water cycle, sources of water and properties of water

**TOPIC: PERSONAL HYGIENE**

-Activities done to promote personal hygiene

-Materials used in keeping our bodies clean

-Importance of keeping our bodies clean

-Dangers of poor personal hygiene

**MUSTARD SEED NURSERY AND PRIMARY SCHOOL**

**SCIENCE LESSON NOTES FOR P.4 TERM I 2024**

**PLANT LIFE**

**PLANTS**

**Types of plants**

1. Flowering plants
2. Non flowering plants.

**Non – flowering plants**

These are plants which do not produce flowers.

**Examples of non-flowering plants.**

* Pines
* Ferns
* Mosses
* Eucalyptus
* Liverworts
* Conifers
* Lichens

**Differences between plants and animals**

**Plants Animals**

* Plants make their own food- Animals do not make their own food.
* Plants have chlorophyll - Animals do not have chlorophyll.
* Plants move by growing - Animals move freely from one place to another.

**Flowering plants**

These are plants that bear flowers.

**Examples of flowering plants**

* Mangoes
* Maize
* Pawpaws
* Peas
* Coffee
* Cotton
* Oranges
* Grapes
* Jackfruit
* Acacia

**STRUCTURE OFA FLOWERING PLANTS**

**Systems of a flowering plants.**

1. Shoot system
2. Root system

**Shoot system**

The system of the plant above the ground level.

It develops from the plumule of the seed.

**Parts of a shoot system**

1. Leaves
2. Fruits
3. Node
4. Terminal bud
5. Stem
6. Flower
7. Internodes
8. Auxiliary bud

**LEAVES**

**Part of a leaf**

Veins

Midrib

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Apex

Leaf margin

Stomata

Leaf blade / Lamina

Leaf base

Leaf stalk

**Functions of each part**

**Leaf stalk (petiole)**: To supply water to the leaf from the branch / stem.

**Leaf base**: Fixes the leaf on the stem.

**Midrib . Mid vein**: Transports water and nutrients from the leaf stalk.

**Veins:**

1. Supply water and minerals from the mid vein to all parts of the leaf.
2. Collect manufactured food from all parts of the leaf to the mid vein.

**Stomata:**

1. For breathing
2. For transpiration

**Lamina (leaf blade)**

1. For respiration
2. For making food / photosynthesis.

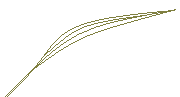
**Leaf venation**

This is the arrangement of veins in the leaf.

**Types of leaf venation**

1. Network leaf venation
2. Parallel leaf venation.

**Parallel leaf venation**

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**Example of plants with parallel venation**

1. All cereals such as maize, millet, maize, rice, sorghum
2. Grass
3. Sugar cane.

**Net leaf venation**



**Examples of plants with network venation**

1. All legumes such as beans, peas, soya beans, ground nuts
2. Jack fruit
3. Mango plant.

**Types of leaves**

1. Simple leaves
2. Compound leaves

**Simple leaves**

These are leaves with one leaflet on the leaf stalk.

**Characteristics of simple leaves**

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

**Kinds of simple leaves**

* Simple entire

**Plants with simple entire leaves**

1. Mango
2. Jackfruit
3. Avocado.

* Simple serrated leaves

Example

Black jack.

* **Simple lobbed leaves**
* Simple palmate leaves

Example

Pawpaw

* Simple lanceolate leaf
* Simple divided leaf

**Compound leaves**

These are leaves with more than one leaflet on the stalk.

**Characteristics of compound leaves**

* They have many leaflets.
* They have many leaf stalks.

**Kinds of compound leaves.**

* Compound pinnate leaves e.g. acacia.
* **Compound bi – pinnate leaves e.g. Jacaranda**
* **Compound trifoliate e,g. beans, soya.**
* **Compound digitate of cassava**

**Uses of leaves to people**

1. Some leaves are eaten as food e.g. cabbage
2. For sale
3. For making shelter for man.
4. For decation e.g. palm leaves.
5. For beverage e.g. tea leaves.
6. For herbal medicine e.g. mango guavas etc.
7. For feeding domestic animals.
8. For making mats.
9. For study purpose.

**Uses of leaves to a plant**

1. For making food (photosynthesis)
2. For breathing
3. For transpiration.
4. Some store food as the plants e.g. onions.
5. Some are used for propagation, e.g. bryophyllum and onions.

The onion bulbil / bulb

**Functions of parts of the onion**

1. Foliage leaves: make food for the onion.
2. Storage leaves: Store food for the onion.
3. Scale leaves: Protect the inside parts.
4. Auxiliary bud: Grows in to a new plant.
5. Stem: holds the leaves together.

**Transpiration**

It is the process through which plants lose water to the atmosphere through leaves.

**Importance of transpiration to plants.**

* It cools the plants.
* It helps the plants to suck more water from the soil.

**Importance of transpiration to the environment.**

* It helps in rain formation.

**Illustration to show how transpiration occurs.**

**How plants control the rate of transpiration**

* By shedding off the leaves.
* Some plants have small leaves.
* Some plants have thick leaves with few stomata.
* Some plants have wax on their leaves e.g. banana.
* Some plants have thorns on stems and leaves e.g. cactus, aloevera.

**Factors affecting the rate of transpiration**

* Size of the leaves: The bigger 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.

**Photosynthesis**

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

**Photo :** means light.

**Synthesis:**  means to build / make / manufacture.

**Conditions for photosynthesis**

Chlorophyll: traps sunlight energy

Sunlight provides energy to the leaf.

Carbon dioxide and water: raw materials.

NB: The raw materials for photosynthesis are carbon dioxide and water.

The bi – product of photosynthesis are oxygen and water, starch.

**Stems**

**Uses of a stem to a plant.**

1. It transports water and mineral salts from the roots to the leaves.
2. A stem transports food from the leaves to other parts of the plant.
3. Some stems are used for propagation e.g. cassava, sugar cane.
4. A stem supports the leaves and branches of a plant.
5. Some stems are used for breathing.
6. Some stems store food for the plant e.g. Irish potatoes, sugar cane.

**Uses of stems to people**

1. Some stems are eaten.
2. Some stems are used for firewood.
3. For herbal medicine.
4. For making timber.
5. For sale.
6. For study purposes.

**Uses of stems to other animals**

1. Some stems are used as food.
2. Some are habitats for some animals e.g. ants, birds.

**Types of stems.**

* Upright stems (Erect stems) e.g. Mangoes, Oranges, Maize.
* Climb stems e.g. cucumber, yam, pea plants, morning glory
* Underground stems e.g. stem tubers: They are swollen underground stems with stored food e.g. Irish potatoes, coco yams.
* Creeping stems e.g. sweet potatoes.
* Rhizomes e.g. ginger, curry, turmeric. Rhizomes are horizontal underground stems.

Note: Sugarcanes are not stem tubers because they are n ot found underground.

**Ways plants climb others**

1. Using tendrils: e.g. passion fruits, cucumber, peas, pumpkins etc.
2. Using hooks or thorns: e.g. bougainvillea.
3. By twinning (clasping): e.g. morning glory, some beans, sponge.

Why do some plants climb others\?

1. For support
2. To get enough sunlight.

**Root system**

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

**Types of root systems**

1. Tap root systems.
2. Fibrous root systems.

**Part of a tap root system**

**Examples**

1. Mangoes
2. Beans
3. Oranges
4. Jackfruit

Main root: supports the plant firmly in the ground.

Lateral roots: supports the plant firmly in the ground.

Root hairs: suck water and mineral salts from the soil.

Root cap: Protects the tip of the roots.

**FIBROUS ROOT SYSTEM**

They grow from one point at the base of the stem. Plants with fibrous root system are; maize, sorghum, millet, rice, wheat.

NB: All cereals have fibrous root system and parallel leave venation.

**Types of roots.**

* Prop roots:

- They are commonly found on cereals

- Their main purpose is to give extra support to a plant.

**Plants with prop roots**

1. Maize
2. Sugarcane
3. Sorghum
4. Burley

* Adventitious roots

They develop from the stems of a plant.

Plants with adventitious roots

1. Onions
2. Bananas
3. Pumpkins
4. Pineapples.
   * Breathing roots
   * Clasping roots
   * Buttress roots
   * Stilt roots.

**Uses of root to people**

1. Some roots are eaten.
2. Some roots are used for making herbal medicine.
3. Some roots are sold to get money.
4. For study purposes.
5. Some roots have nodules which make the soil fertile.

**Uses of roots to plants.**

1. They hold the plant firmly in the soil.
2. They suck water and mineral salts from the soil.
3. Some roots are used for breathing.
4. Some roots store food for the plant e.g. cassava, sweet potatoes.

**Root tubers**

They are swollen underground roots with stored food.

**Examples**

1. Sweet potatoes
2. Cassava
3. Carrots

**Flowers**

A flower is a reproductive part of a plant.

Uses of flowers to plants

* For reproduction.

**Uses of flowers to people**

1. For decoration
2. Showing love
3. For sale.
4. For making perfume.
5. They are used as wreaths.
6. Some flowers are eaten.
7. Some are used as a sign of welcome (bouquet)

**Uses of flowers to other animals**

1. Bees collect nectar and pollen from flowers.
2. Humming birds, sun birds collect nectar from flowers.

**Structure of a flower.**

**Importance of each part**

Flower stalk: Holds the flower on the stem.

Sepals: Protect the flower when it is still young.

They make food for the flower.

NB: A group of sepals is called calyx.

Anthers: Produce pollen grains.

Filament: Hold the anthers.

Stigma: Receives pollen grains during pollination.

NB: A group of stigmas is called carpel.

Style: Holds the stigma up right.

Allows pollen tubes to pass through to the ovary.

Petals: Brightly coloured petals attract pollinators e.g. birds, insects.

Ovary: Develops into a fruit after fertilization.

Ovules: Develops in to seeds after fertilization.

**Pollination.**

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

**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.

Plants which carry out self-pollination.

* Tomatoes
* Wild marigold.

**Cross pollination**

It is the transfer of pollen grains from the anthers to the stigma of different plants but of the same kind.

Movement of pollen grains.

**Plants which carry out cross pollination**

1. Maize
2. Coconut
3. Pawpaw
4. Cow peas
5. Passion fruits

**Difference between self pollinated flower and cross pollinated flowers.**

|  |  |
| --- | --- |
| **Self-pollinated** | **Cross pollinated** |
| * Filaments are longer than styles * Pistils and stamen on the same flower. * Large amounts of pollen grains produced. * Anthers raised higher than the stigmas. | * Styles are longer than filaments. * Pistils and stamen on different flowers. * Small amounts of pollen grains produced. * Stigmas raised higher than anthers. |

**Agents of pollination**

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

**Examples of agents of pollination.**

1. Insects like bees, butterflies, months, beetles.
2. Birds like sun birds, humming birds.
3. Animals like man.
4. Wind.

**Different between wind pollinated flowers and insect pollinated flowers**

|  |  |
| --- | --- |
| **Insect pollinated flowers**   * Have brightly coloured petals. * Have large petals. * Produce good scent. * Produce nectar. * Produce few pollen grains. * Have sticky stigma * Have heavier pollen grain | **Wind pollinated flowers**   * Have dull coloured petals * Have small petals. * Produce no scent. * Produce no nectar. * Produce a lot of pollen grains. * Have hairy stigma. * Have lighter pollen grains |

**Seeds**

A seed is a fertilized ovule

**Classes / Types / Groups of seeds**

1. Monocotyledonous / monocot seeds
2. Dicotyledonous / Dicot seeds.

**Monocotyledonous seeds**

These are seeds with one cotyledon

**Examples of monocot seeds**

* Maize
* Wheat
* Rice
* Millet
* Sorghum

NB: These seeds are also called cereals or grains.

**Maize grain (fruit)**

* A maize grain is not called a seed but it is called a fruit.
* It is called a fruit because it has two scars.

**Scars of a maize grain**

1. Style scar
2. Stalk scar

**External parts of a maize grain / fruit.**

**The internal parts of a maize grain / fruit**

**Functions of each part.**

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

Radicle: develops into root system.

Plumule: develops into shoot system.

Embryo: grow into a new plant.

Endosperm: It stores for the embryo.

Cotyledon: It absorbs food from the endosperm

Simplifies the food for embryo during germination.

Style scar: The part where the style was attached.

**Dicotyledonous seeds.**

These are seeds with two cotyledons.

Examples of dicotyledonous seeds

* Beans
* Peas
* Groundnuts
* Oranges
* Simsim etc

**Characteristics of dicotyledonous seeds**

1. They have two cotyledons.
2. They have tap root system.
3. They store food in the cotyledon.
4. They have network leaf venation.
5. They undergo epigeal germination.

**External parts**

**Internal parts**

**Functions of each part:**

Cotyledon : Stores food for the embryo.

Testa/ seed coat: Protects the inside parts of a seed.

Radical : Develops into root system.

Plumule : Develops into shoot system.

Scar / hilum : Is where the seed is attached to the pod or fruit.

Micropyle : A hole that allows in air and water into the seed during germination.

Embryo : (Radicle and plumule): Grows in a new plant.

**Seed germination.**

It is the growing of a seed into a seedling.

A seedling is a young plant.

**Conditions for germination**

1. Water
2. Warmth
3. Oxygen

**Importance of each conditions.**

Water : It softens the testa for the embryo to pass.

Oxygen : It is used for respiration.

Warmth: Provides the right temperature for germination.

**The process of germination**

1. Water enters the seed through the micropyle.
2. The testa softens, relaxes and allows the embryo to pass through.
3. The cotyledon can either remain in the ground or come out of the ground.

**Types of germination**

1. Epigeal germination
2. Hypogeal germination.

**Epigeal germination.**

The type of germination where the cotyledon comes out of the ground / soil.

Plants with epigeal germination.

1. Beans
2. Soya
3. Peas
4. Groundnuts
5. French beans
6. Simsim.

Hypogeal germination

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

**Plants with hypogeal germination**

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

Topical exercise questions

1. How is transpiration important to the environment?
2. State the gas needed during germination.
3. How are flowers important to plants?
4. Maize grains has two scars namely \_\_\_\_\_\_\_\_\_\_\_\_ and stalk scar.
5. How is chlorophyll useful during photo synthesis?
6. Draw a maize grain and show the endosperm.
7. Give one example of insect pollinator.
8. Below is a diagram showing away a plant uses for climbing.

Name it.

1. Which part of a flower attracts pollinators like insects?
2. Name one example a root tuber.
3. What type of leaf venation has a maize plant?
4. Why do some plants climb others?
5. In the space below draw a well labeled stamen.
6. Mention one function of a stem to a plant.
7. Briefly explain the term “seedling”

**GROWING CROPS**

**Crops**

A crop is a plant grown for a purpose.

**Types of crops**

1. Cereals
2. Legumes
3. Root crops
4. Fruit crops
5. Vegetables

**Cereals**

Cereals are sometimes called grains or monocots.

**Examples of cereals**

* Maize
* Millet
* Sorghum
* Rice
* Wheat
* Barley

**Leguminous crops (Legumes)**

* They have nodules on their roots.
* They have seeds in pods.

**Examples of legumes**

* Beans
* Peas
* Groundnuts
* Soya beans

**Root structure of a leguminous crop**

Root nodules:-

* Swellings found on roots of leguminous plants.
* They keep nitrogen fixing bacteria.

NB: Nitrogen fixing bacteria trap nitrogen from air and change in to nitrates as plant food.

**Fruit crops**

* Mangoes
* Apples
* Pumpkins
* Pawpaw
* Pine apples.

**Root crops**

* Sweet potatoes
* Cassava
* Carrots

**Vegetables**

* Cabbage
* Spinach
* Lettuce
* Dodo
* Nakati
* Bbuga

**Groups of crops**

1. Annual crops
2. Perennial crops

**Annual crops:**

These crops grow, produce and die within a year.

**Examples:**

* Beans
* Maize
* Soya beans
* Millet
* Sorghum
* Rice etc

**Perennial crops**

These crops grow, produce and die in more than a year.

Examples:-

* Tea
* Coffee
* Cocoa
* Mango
* Banana

**Garden tools and their uses**

|  |  |
| --- | --- |
| Hoe | * Digging * Planting * Weeding * Harvesting |
| Spade | * Mixing manure * Lifting soil. |
| Rake | * Leveling soil * Collecting weeds. |
| Wheel barrow | * Carrying soil * Carrying manure * Carrying harvests |
| Slasher | * Cutting grass * Cutting weeds |
| Axe | * Cutting big trees * Chopping wood |
| Panga | * Cutting small branches * Cutting trees. * Harvesting sugar cane |
| Forked hoe | * Digging hard ground * Digging stony ground |
| Watering can | * Watering crops * Watering seedling |
| Trowel | * Transplanting * Carrying seedlings |
| Garden fork | * Mixing manure |
| Pick axe | * Digging in rocky ground. * Digging in stony soils. |
| Secateur | * Pruning crops |
| Pruner | * Pruning crops |
| Hand fork | * Light weeding * Removing seedling from soil. |
| Sprayer | * Spraying crops. |
| Knives | * Harvesting * Pruning * peeling |
| Tape measure | * Spacing crops in the garden. |
| Sickle | * Harvesting. |

**Care for garden tools**

* Washing after use and drying them.
* Keep the tools in dry place.
* Painting some of them.

**Crop growing practices.**

1. **Land preparation**

It is done during dry season to:-

* + Prevent the weeds from germinating again after digging and ploughing.
  + Avoid the soil from sticking on to the hoe or plough.

**Ways of preparing land**

* Digging
* Ploughing
* Slashing / clearing
* Cutting big trees
* Harrowing
* De – trashing.

**Garden tool / 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. Allows air in to the soil.
5. Cutting away big trees opens space for crops to get enough sunlight.
6. **Selecting viable planting materials**
7. Examples of planting materials.
8. Seeds
9. Suckers
10. Stem cuttings
11. Rhizomes
12. bulbs
13. **Qualities of good planting materials**
14. They should be mature
15. They should not be damaged
16. They should be free from pests.
17. They should be free from diseases.
18. They should not be too old.
19. They should be of the same variety.
20. **Importance of selecting planting materials**
21. It prevents wastage of land.
22. It ensures quality plants.
23. It prevents wastage of time.
24. It prevents wastage of labour.

**Planting and sowing**

This is putting of planting materials in the soil to germinate.

NB: 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.

**Methods of planting**

1. Planting in rows
2. Broadcasting method.

**Row planting**

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

**Advantages of row planting**

* It makes weeding easy.
* It makes harvesting easy.
* It controls 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.

**Example of plants planted by row planting**

* Maize
* Cassava
* Beans
* Pineapple
* 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 of broadcasting methods**

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

**Nursery bed.**

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

NB:

* Trowel is the garden used during transplanting.
* Transplanting is best done in the evening.

**Transplanting**

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

**Why transplanting is done in the evening**

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

**Garden tool used for transplanting.**

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

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

**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.
5. It helps water to sink deeply in to the soil.

**Advantages of early planting**

* Crops make full use of rainfall for the season.
* Cereals mature early therefore get good market.
* Crops grow fast enough and compete with weeds for light nutrients and water before they flow.

**Gap filling**

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

Staking

Provision of extra support for plants with weak stems.

**Caring for crops.**

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.

**Weeding**

This is removal of unwanted plants from the garden.

**Examples of weeds**

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

**Garden tools for weeding**

1. Hand fork
2. Slasher
3. Hoe

**Dangers of weeds in the garden**

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

**Ways of controlling weeds.**

1. Slashing
2. Spraying / using herbicides.
3. Up rooting
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 diseases.
4. It prevents the easy spread of crop pests.

**Uses of weeds to people.**

1. Some weeds are used as herbal medicine.
2. Some weeds are used as mulches.
3. Some weeds are used as animal feeds e.g. elephant grass for cattle.

**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)**

1. Compost manure: It is got from plant materials and animal wastes.
2. Green manure: It is got from ploughed, buried and rotten green materials like legumes.
3. Farm yard manure (F.Y.M): It is got from farm animal wastes, urine and decayed material.
4. Organic mulches: It is got through mulching using dry plant materials.

**Mulching**

Mulching is the covering of top soil with dry plant materials.

NB: Mulches are plant materials used for mulching.

**Examples of mulches**

* Elephant grass
* Coffee husks
* Banana leaves
* Chopped stems of bananas.
* Spear grass.

**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**

This 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.

**Garden tool 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.

**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 crop pests.**

* They weaken plants.
* They lead to low produce.
* They lead to poor growth of crops.
* They destroy crops.

**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.
* Early planting.

**Crop diseases**

**Some crop diseases.**

|  |  |
| --- | --- |
| Disease | Plant attacked |
| Cassava mosaic  Leaf rot | Cassava plant |
| Tomato blight | Tomatoes |
| Ground nut Rosette | Groundnuts |
| Leaf spot  Maize streak | Maize |
| Powderly mildew | Mangoes, pawpaws, turnips |
| Smuts | Sugarcane, maize, sorghum |
| Rust | Cereals mill, maize, barley, wheat |
| Panama | Banana |

**Ways of controlling crop diseases**

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

**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.

NB:

1. Legumes are alternated with non – leguminous plants.

Why: They make soil more fertile since legumes and nutrients to the soil.

1. Shallow rooters are alternated with deep rooters.

Why? This balances the use of nutrients from soil at different levels.

**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.

**Harvesting**

This is collecting of ready (manure) crops from the garden.

* It is done during the dry season to dry harvests.

**Some garden tools for harvesting**

|  |  |
| --- | --- |
| **Tool** | **Purpose** |
| Sickle | Harvesting cereal crops |
| Hoe | Harvesting root crops. |
| Panga | Harvesting sugarcane, banana. |

**Methods of harvesting**

1. Hand picking (e.g coffee, oranges etc)
2. Cutting stems (e.g. sugarcane, banana)
3. Uprooting (e.g. groundnuts, cassava)
4. Digging (e.g. potatoes).

**Storing of food**

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 soils
3. In refrigerators / freezers

**Qualities of a good store**

* It should be well ventilated.
* The roof should be leak proof.
* It should have rat guards.
* It should be clean and dry.

**A diagram showing a granary.**

**NB:**

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

**Some storage pests**

* Rats
* Maize weevil
* Bean weevil
* A storage beetle.
* Harvest mite

**Food preservation**

Is the preventing food from going bad.

**Methods of preserving food**

|  |  |
| --- | --- |
| Sun drying | Cassava, sweet potatoes, maize, Irish potatoes, Onions, millet, rice, sun flower, wheat, beans, soya beans, peas. |
| Freezing | Oranges, mangoes, avocados, sweet banana, Irish potatoes, cucumber, cabbage, water melon. |
| Tinning | Beans, Tomatoes. |

**TOPICAL QUESTIONS**

1. How do we call plants with root nodules?

2. Mention one example of a root tuber.

3. In the space below draw a garden tool for transplanting.

4. Give one example of a crop grown in a nursery bed.

5. Which season is best for harvesting?

6. Define crop rotation.

7. Apart from broadcasting methods of planting, name the other method.

8. Suggest one use of weed to people.

9. Write F.Y.M in full.

10. Give one disease that attacks tomatoes in the garden.

11. (a) What is harvesting?

(b) Mention two tools for harvesting.

(c) Suggest one method of harvesting.

12. (i) Give the meaning of the word pest!

(ii) Name two storage pests you know.

(iii) State one danger of pests to crops.

13. (a) Write two qualities of good planting materials.

(b) Mention one example of planting materials.

(c) Suggest one importance of early planting.

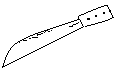
14. (a) Give two ways of preserving food.

(b) Why are rat guards put on the granary.

(c) List one place where food can be stored.

15. (a) Which term is used for covering of top soil with dry plant materials?

(b) Write three examples of mulches.

16. Name the garden tools below:-

 (i) (ii)

**WEATHER CHANGES AROUND US**

**WEATHER**

Weather is the condition of the atmosphere at a given time.

**Note:** The average weather condition of a place recorded for along period of time is called **climate**

**Types / states / conditions of weather**

* Rainy
* Sunny
* Cloudy
* Windy

**Weather chart**

**Elements of weather (factors**

Rainfall - Humidity - Air pressure

Sunshine - Temperature -

Cloudy cover - Wind

**Rain fall**

* Rain is water falling in separate drops from clouds.
* Rainfall is the amount of rainwater that falls in a certain area at a certain time.

**Types of rainfall**

There are three types of rainfall namely:-

1. Relief rainfall
2. Convectional rainfall
3. Cyclonic rainfall.

**Relief rainfall**

This is a type of rainfall received around mountainous and hilly places.

It is also known as aerographic rainfall.

Diagram

Convectional rainfall:-

This is the type of rainfall received on land and places near water bodies.

It is formed in the same way as the water cycle.

**A diagram to illustrate a water cycle.**

**Experiment to show a water cycle (diagram)**

**Note:**

Water cycle is a process by which rain is formed.

The water cycle involves the following process:

1. **Evaporation:**

This is a process by which water changes to vapour.

1. **Transpiration:**

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

1. **Condensation:**

This is the process by which vapour changes to water.

**Cyclonic rainfall:**

This type of rainfall is received as a result of warm air meeting cold air in a certain place.

**Diagram**

**Note:**

**1.** Rainfall is measured by an instrument called **rain gauge.**

2. Rainfall is measured in **millimeters.**

3. The rain gauge must be placed in an open place where rain is not destructed in order to get the correct amount of rainfall received.

4. The rain gauge should raised 30cm above the ground to prevent running water from entering the measuring cylinder.

**A diagram of a rain gauge.**

**Uses of rainfall (advantages)**

* Rainfall provides water for domestic use, industrial use, etc.
* Rainfall waters plants.
* It helps farmer’s crops to grow quickly and have good yield.
* It cools down the temperature in the atmosphere.
* It also softens the soil for easy cultivation.
* It increases the volume of water in water bodies for easy generation of hydroelectricity power.

**Disadvantages (dangers) of too much / heavy rainfall**

* Too much rainfall causes floods.
* A lot of rainfall causes delay in transport.
* A lot of rainfall causes very cold temperature.
* Brings difficulty in constructing roads, houses etc.
* Too much rainfall can spoil crops and buildings.
* It also kills people.

**SUNSHINE**

Sunshine is measured by an instrument called sunshine recorder.

**Diagram of a sunshine recorder**

**Note:**

* Sun is the main natural source of heat and energy.
* It provides us with vitamin D with the help of the skin.

**Advantages / uses / importance of sunshine**

* It helps in rain formation.
* It dries harvested crops.
* It helps plants to make their own food.
* Helps our skin to make vitamin D.
* It kills some germs.

**Disadvantages / dangers of too much sunshine**

* It makes it very hot.
* Too much sunshine makes the soil hard for cultivation.
* It dries water sources.
* It kills animals and plants.

Clouds

Clouds are grouped according to their heights and general shape.

**Types of clouds**

(a) **Circus clouds**

- They look like feathers in the sky.

- They are the furthest in the sky at a height of 800m to 16000m above the ground.

(b) **Cumulus clouds**

- They are white clouds which resemble cotton piles with a flat bottom.

- They can develop into thunder and thus they may indicate rain.

(c) **Stratus clouds:**

- They are nearer the earth than the cumulus.

- They are a sign of fair weather.

(d) **Nimbus clouds**:

- They are clouds that bring us rain or give us rain.

- They are nearest to the earth.

- They are dark grey in colour.

**HUMUDITY:**

* This is the amount of water vapour in the atmosphere.
* When there is a lot of water vapour in the air, the weather is said to be humid.
* Humidity is measured by an instrument called **hygrometer** or a wet and dry bulb.

**Diagram**

**TEMPERATURE:**

* This is the hotness or coldness of a baby or a place.
* The instrument used to measure temperature is called a **thermometer.**
* A thermometer is read in two scales namely:-

\* Degrees Celsius / centigrade

\* Degrees Fahrenheit.

**Types of thermometers**

These are two types of thermometers namely:-

* Clinical thermometer
* Minimum and maximum thermometer.

1. **Clinical thermometer**

- It is used in hospitals by doctors, nurses, etc to measure the human body temperature.

- The temperature of a human body must remain constant at 370C or 98.40F except when the person

is sick or has fever.

- The clinical thermometer is placed in the following places:-

\* In the mouth under the tongue to prevent biting and breaking the bulb.

\* In the arm pit.

\* In the anus

\* In the vagina.

**Diagram of a clinical thermometer**

**Minimum and maximum thermometer**

* It is sometimes called the six’s thermometer because it was first made by James six.
* The minimum and maximum thermometer is used to measure the lowest and highest temperature of the day.
* It uses both alcohol and mercury.

**Diagram**

**Note:**

1. In a weather station, we find the Stevenson screen where delicate weather instrument are kept.
2. A Stevenson screen is painted white to reflect heat.

**Diagram of a Stevenson screen**

**WIND**

* Wind is moving air.
* The instrument used to measure the direction of wind is called a **wind vane.** The arrow of the wind vane points in the direction from which wind is blowing.

**Other wind instruments**

* **A wind sock** measures the direction and strength of wind but it points in the direction in which wind is blowing.
* **Anemometer** measures the speed of wind.

**Diagram of wing instruments**

**Advantages of wind:-**

* Wind helps to bring cold air in warm places.
* Wind helps in pollination of plants.
* Wind helps farmers to remove husks from their seeds (used in winnowing)
* Wind helps in the formation of rainfall.
* Wind dries wet things e.g. paint, clothes, etc.

**Disadvantages of wind**

* Wind can spread diseases like tuberculosis.
* Wind can take away top soil (causes soil erosion)
* Strong wind throws down houses, buildings and trees.
* Wind causes storms on land, lakes, seas, oceans and become a transport problem.

**ATMOSPHERIC PRESSURE**

* This is the force exerted by air in the atmosphere.
* It is caused by the movement of wind or air from one place to another.
* Atmospheric pressure is measured by an instrument called a barometer.

**Diagram of a barometer.**

**PERSONAL HYGIENE**

* Personal hygiene is the keeping of our bodies and the things we use clean.
* It is also the general cleanliness of our bodies.

**Ways of keeping our bodies clean (How to keep our bodies clean)**

* Bathing regularly.
* Cutting finger and toe nails short.
* Brushing teeth every day.
* Washing hands after visiting the toilet or latrine.
* Washing hands after a physical task like digging picking rubbish etc.
* Washing hands before eating or touching food.
* Washing clothes regularly.
* Washing beddings regularly
* Combing hair daily.
* Ironing clothes and bedding.

**Items or things used in keeping our bodies clean**

* Water (clean) - bathing sponge - Towel
* Tooth paste - soap - Nail cutters / razor blade
* Tooth brush - comb - Dental floss
* Teeth picks - Ear buds

**How to keep things / items at home clean.**

1. Beddings and clothing: - Washing them

- Ironing

- spreading under the sunshine

- Spraying with insecticides

1. Utensils: - Washing

- Drying them

1. Kitchen: - Sweeping

- Mopping

- Scrubbing

- Removing cob webs.

**Importance of keeping our bodies clean**

* It controls the spread of germs.
* It prevents bad body smell.
* It prevents skin diseases.
* It prevents teeth diseases.
* It prevents lice, mites and ticks.
* To remove dirt.
* To be smart.

**END OF TOPIC QUESTIONS**

1. What do you understand by personal hygiene?

2. State any two ways of keeping our bodies clean.

3. Identify any two items used in keeping our bodies clean.

4. Why is brushing our teeth regularly important to our bodies?

(i) \_\_\_\_\_\_\_\_

(ii) \_\_\_\_\_\_\_\_

5. Suggest two reasons why people iron their clothing and bedding.

(i) \_\_\_\_\_\_\_\_\_\_\_\_

(ii) \_\_\_\_\_\_\_\_\_\_\_\_

6. Why do we wash our hands with soap and clean water after latrines or toilets?

7. Why do we cut our finger and toe nails short?

8. Raymond, a pupil in P.4 ate an un washed mango in the morning. Identify any two diseases he is likely to face.

9. How do we keep the following items at home clean?

(a) Beddings and clothing:

(i) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(ii) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(b) Utensils:

(i) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(ii) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why is keeping our bodies clean important? Give three reasons.