

TERM II Components of the environment soil

1. Heat energy
2. Occupants in our community, crop growing
3. Bacteria and Fungi

TERM III Types of changes – Biological, Physical and Chemical changes

1. Keeping Goats, Sheep and Pigs
2. Food and Nutrition
3. Primary Health Care (PHC)

COMPONENTS OF THE ENVIRONMENT:

SOIL

Soil is a continuous layer that covers the earth's surface.

Or

Soil is a medium in which plants grow and get water and mineral salts.

HOW SOIL IS FORMED

- 1) By weathering
- 2) By decomposition of organic matter.

Weathering is the physical and chemical breakdown of rocks into small particles to form soil.

Decomposition is the rotting of dead organic matter.

TYPES OF SOIL

There are three types of soil

- i. Clay soil.
- ii. Loam soil.
- iii. Sandy soil.

a) CLAY SOIL

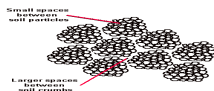
Characteristics of clay soil

- It has fine particles.
- It has closely packed particles.
- It does not allow water to pass through it very fast.
- It has a high water retention capacity so it easily becomes water logged.
- It can not easily be reached.
- Clay soil has the highest rate of capillarity

Importance of clay soil

- Clay soil is good for pottery work (making pots, ceramics and modeling).
- Clay soil is good for making bricks for building.
- Good for making tiles for roofing.

Illustration of arrangement of particles in clay soil.



b) LOAM SOIL

Loam soil is a mixture of clay soil and organic matter

Organic matter (humus) consists of decayed plants and animal matter

Loam soil usually has adequate water, air and humus to sustain plant growth.

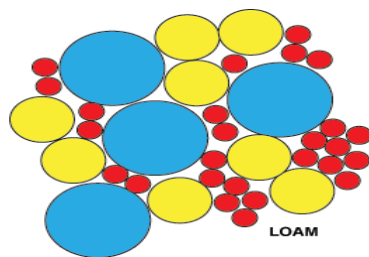
Characteristics of loam soil.

- It's particles are fairly arranged
- It contains both clay and sand particles.
- It has a lot of humus for plant growth.
- Has fairly larger air spaces as compared to clay soil

Importance of loam soil

- It is good for crop growing.

Illustration of arrangement of particles in loam soil.

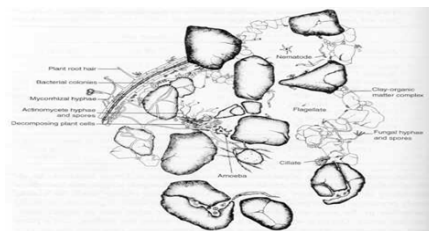


Qn. Why is loam soil the best for plant growth?

- 1) **It contains a lot of humus.**
- 2) **It contains balanced particles of sand and clay.**

c) SANDY SOIL

Illustration of arrangement of particles in sandy soil.



- Has large particles that makes it to be well aerated
- Water passes through it easily
- Has poor water retention capacity
- Has high water drainage
- It is easy to dig
- Has a poor rate of capillarity

Capillarity is the up take of water through the soil particles. /

Capillarity is the tendency of water to rise through small narrow spaces.

Drainage is the capacity of the soil to allow water to pass through it.

Importance of sandy soil.

- Used for building.
- Used for making glass and sand papers.

Nb.It is not good for crop growing because it has a low water holding capacity.

COMPONENTS OF THE SOIL

These are things which make up soil, they include:

- Air.
- water
- humus
- rock particles
- living organisms eg bacteria, insects, earthworms etc.

Importance of components of soil

a) Air

- Air is used by animals in the soil to respiration.
- Air is used during germination.

b) Water

- Water is used by plants for germination
- Making starch (it is a raw material for photosynthesis)
- Promoting decay of matter

c) Rock particles (inorganic materials like: sand, gravels, clay formed by weathering)

- Provide space for air to occupy

d) Humus – dead decayed plants and animal matter

- Provide plant nutrients.
- Improve soil fertility
- Makes the soil appear dark in colour

e) Living organisms

Examples of animals that live in the soil.

Bacteria, moles, porcupines, earth worms and ants

- Bacteria like nitrogen fixing bacteria fix nitrogen in the soil and hence improving on soil fertility.

Earthworms

- Aerate the soil.
- Softens the soil /plough the soil

- Add soil fertility by breaking down dead plants and animal remains.

NB: Why do you think earthworms come out of the soil after raining?

- To breathe /take in oxygen.

PROPERTIES OF SOIL.

- It has air.
- It has water.
- It contains mineral salts.

SOIL PROFILE

Is the vertical arrangement of soil layers.

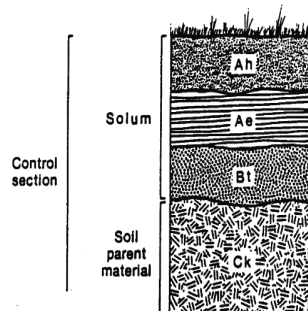
Or

Arrangement of soil layers from top to bottom.

Areas where one can clearly see soil profile.

- Pit latrines. – In trenches.

Illustration of the layers of the soil.



Importance of the top most layer.

- It contains most of the nutrients for plant growth.

Briefly explain the following terms.

- **Soil texture.** These are the different sizes of soil particles in an area.
- **Soil structure.** I the way soil particles are grouped/ arranged.

SOIL EROSION

Is the washing away of top soil by its agents.

AGENTS OF SOIL EROSION

These are forces that carry away top soil from one place to another. These include:

- Running water
- Wind
- Animals

CAUSES OF SOIL EROSION

These are main activities that enable the agents to take away top soil.

How?

- They expose the soil to agents

These include

- Deforestation
- Overgrazing
- bush burning
- Monoculture (mono-cropping)
- Ploughing down slopes.
- Over cultivation.

TYPES OF SOIL EROSION

- a) Sheet erosion: Top soil is washed away uniformly by running water
- b) Gully erosion (deep channels)
- c) Rill erosion (shallow channels)
- d) Splash erosion /raindrop erosion
- e) Stream /river bank erosion
- f) Wind erosion

Effects of soil erosion.

- Leads to soil exhaustion.
- It affects soil texture

PREVENTION AND CONTROL OF SOIL EROSION.

1. **Terracing:** reduces the speed of running water
2. **Strip cropping:** reduces the speed of running water
3. **Contour ploughing:** is the ploughing across a slope.
It helps to reduce the speed of running water
4. **Afforestation:** is planting of trees where they have ever existed. This also keeps the soil covered from direct rain drops.
5. **Re-afforestation:** is the planting of trees where they have been ever existed. This also keeps the soil covered from direct rain drops.
6. **Cover cropping:** planting cover crops between plants that take long to mature.

Cover crops

These are crops that are planted between plants that take long to mature

Qn: How does cover cropping prevent soil erosion?

Cover crops reduce the speed of running water

Qn: How does inter-cropping reduce soil erosion?

Reduces the speed of running water

7. **Bush fallowing:** resting period of land to regain its fertility

Importance: enables the land to regain its fertility

8. **Mulching:** is the covering of top soil with any plant material (dry plant materials)

Advantages of mulching.

- Controls soil erosion. **How?** By reducing the speed of running water.
- Maintains soil fertility. **How?** by reducing soil erosion and mulches rot to form humus.
- Keeps water in the soil. **How?** by controlling the rate evaporation of water from the soil.
- Increases on the crop yields.
- Reduces the rapid growth of the weeds.

Disadvantages of mulching

- Mulches keep pests.
- Dry mulches can be fire hazards.
- Some mulches can grow into weeds.

How soil loses its fertility

Through:

- Leaching. It is the sinking of plant nutrients deeper into the soil where plant roots can't reach.
- Soil erosion
- Monoculture (mono-culture)
- Bush burning

How can we improve soil fertility

- Mulching
- Crop rotation
- Bush fallowing
- Addition of fertilizers
- By terracing
- Afforestation

FERTILISERS.

These are substances put in the soil to increase it's fertility.

Types fertilizer

- Artificial fertilizers.
- Natural fertilizers.

ARTIFICIAL FERTILIZERS

Are fertilizers got from inorganic matter artificially.

Types of artificial fertilizers

- Straight fertilizers.

- Compound fertilizers.

Straight fertilizers.

These are fertilizers that supply one nutrient to the soil.

Examples: SSP (single super phosphate), nitrogen, phosphorus, potassium.

Compound fertilizers.

These are fertilizers that supply more than one nutrient to the soil.

Examples: diammonium phosphate, NPK.

Advantages of using artificial fertilizers

- They have a high nutrient content needed by the plants.
- They are easy to handle, use and store.
- They help to make plants resistant to diseases as they grow.

Disadvantages of using artificial fertilizers

- They are expensive to buy.
- They require skilled labour to apply it.
- They stay in the soil for a shorter period.
- They are poisonous to animals, people and birds.
- They pollute water sources when washed there.
- They destroy soil texture and structure.
- They make the soil acidic.
- They kill organisms in the soil.

Natural fertilizers (manure)

These are fertilizers made from decayed plant and animal materials (lumus)

Types of natural fertilizers (manure)

There are four types of manure

1. Compost manure
2. Green manure
3. Farm yard manure
4. Organic mulch.

Compost manure

Is got from both plant and organic waste matter left to decay.

Things used to make compost manure.

- banana peeling.
- dry grass

- maize stalks
- leaves.

COMPOST HEAP.



Importance of compost manure

- Adds humus to the soil (improves soil fertility)
- Controls leaching
- Improves soil structure

Advantages of compost manure

- It is cheap.
- Its nutrients last for a longer time
- It is not poisonous to people, animals and birds
- It does not require skilled labour to apply it.
- Provides many nutrients to the soil at the same time.

Nb: When making compost manure, water sh'd be added to the compost heap to make the rotting faster.

Disadvantages of compost manure

- Produces bad smell
- It takes a lot of space
- Soil nutrients take long to be released into the soil
- It is not easy to tell which nutrients is present in the compost manure

Green manure

It is made from green crops especially legumes that are ploughed back into the soil at the flowering stage.

Why legumes? They can rot in a shorter time.

Advantages of green manure

- It lasts for several seasons in the soil.
- It rots and mixes easily into the soil.
- Its nutrients last for a longer time
- It is not poisonous to people, animals and birds
- It does not require skilled labour to apply it.

Disadvantages of green manure

- It is time wasting.
- It requires a lot of labour to plough it back into the soil.
- It is not easy to tell which nutrients is present in the green manure.

Farm yard manure

Is the manure got from animal wastes like dung and urine mixed with their bedding materials.

Advantages of farm yard manure

- It is cheap
- Its nutrients last for a longer time
- It is not poisonous to people, animals and birds
- It does not require skilled labour to apply it.
- Provides many nutrients to the soil at the same time

Disadvantages of farm yard manure

- It contains little amount of mineral salts.
- Produces bad smell
- It takes a lot of space
- Soil nutrients take long to be released into the soil
- It is not easy to tell which nutrients is present in the compost manure.

Effects of harmful materials on the soil

- Non degradable materials do not rot or decay
- They prevent or block air and water from entering the soil
- They lead to soil exhaustion.

These materials are called pollutants

Examples of soil pollutants.

- Polythene papers (buvera)
- Plastic materials
- Rubber materials (old shoes)
- Glass and broken bottles

- Metallic materials like nails, tins, etc
- Concrete from broken buildings.

Ways of properly handling wastes.

- Reusing plastic materials like jerricans for other purposes like fetching water.
- Making new things from some wastes (recycle)
- Returning some wastes like bottles to the factories that make sodas.
- Rejecting/ refusing the use of non biodegradable materials like polythene bags.
- Reducing on the production of non biodegradable materials.

SOIL BARRIERS

These are things (materials) that prevent soil from being carried away by the agents of soil erosion.

Examples of soil barriers

- Grass (cover crops)
- Trees /roots
- Rocks
- Concrete walls
- Contours
- Gabions. Etc

SOIL CONSERVATION

Is the maintaining (preserving) of soil fertility.

Methods of soil conservation

- Afforestation /re-afforestation
- Bush fallowing
- Terracing hilly areas
- Rotational grazing
- Contour ploughing
- Strip cropping
- Crop rotation
- Mulching
- Cover cropping
- Mixed farming
- Manuring /application of the fertilizers
- Agro-forestry.

Importance of soil conservation

- Retains soil fertility
- Retains soil moisture
- Prevents spread of diseases and pests.

FORMS OF ENERGY

Energy is the body's ability to do work

Matter

Matter is anything that has mass and volume

OR

anything that has weight and occupies space

The meaning of each of the following

- Mass:** Is the space occupied by an object.
- Volume:** Is the space occupied by an object.
- Molecules:** It is the smallest particles of matter.
- Weight:** is the gravitational force exerted on an object.

States of matter

There are three different states of matter

- Solids
- Liquids
- Gases

Arrangements of molecules in each of the above state of matter

Solids

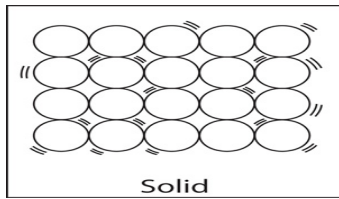
Examples of solids.

- Wood
- Rubber
- Glass
- Plastic

Characteristics of solids.

- Molecules are closely packed.
- Particles are held together very tightly.
- Molecules do not move from position but vibrate.
- Solids have shape, size and volume apart from irregular objects.

Diagram to show the arrangement of molecules.



Liquids

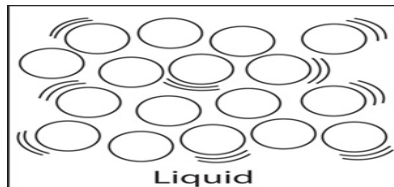
Examples of liquids.

- Water
- Soda
- Oils
- Juice

Characteristics of liquids.

- Molecules are spaced.
- Molecules loosely held together.
- Liquids have a proper volume (capacity)
- Liquids have no definite shape (take up the shape of the container in which they are poured)

Diagram to show the arrangement of molecules.



Gases

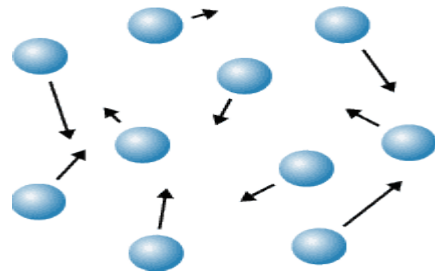
Examples of gases.

- Nitrogen
- Carbondioxide
- Oxygen
- Rare gases

Characteristics of gases.

- Molecules are far apart
- Gases have no definite shape
- Gases have a particular volume.
- Molecules move freely.

Diagram to show the arrangement of molecules.



Forms of energy

Energy is ability to do work

Types of energy

- Kinetic energy
- Potential energy

Potential energy

Is the energy that is stored by an object at rest.

Examples of potential energy

- A baby being asleep in a cot
- A car standing still at traffic lights
- A pupil sitting and listening to the teacher
- A stone / book ruler resting on a table /ground /cupboard etc

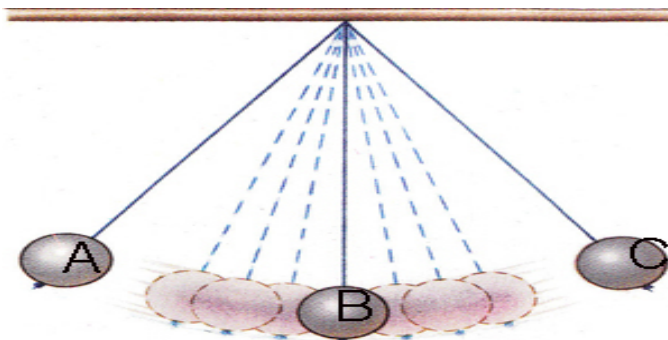
Kinetic energy

This is the energy possessed by a moving object or an object in motion. It is also referred to as the energy in motion

Examples of kinetic energy

- A girl running along the road
- An arrow flying through the air
- A stone thrown up in air
- A brick dropping from a wall
- A leaf falling to the ground from a tree

Think of a stone or a pendulum swinging in air



At a, the stone possess potential energy

At b, the stone possess kinetic energy

Forms of energy include

- Heat energy
- Sound energy
- Light energy
- Sound energy
- Electric energy
- Magnetic energy
- Chemical energy
- Solar energy e.t.c.

HEAT ENERGY

Heat energy is a form of energy that increases temperature of an object

Standard units for measuring heat.

Heat **Calories**

Instruments used to measure heat.

Heat **Calorimeter**

sources of heat

These are objects that produce heat.

Types of sources of heat.

- i. Natural sources of heat
- ii. Artificial sources of heat

Natural sources

Natural sources of heat provided by nature.

Examples.

- Sun (main natural source of heat)
- Food
- Stars
- Erupting volcanoes

Artificial sources.

These are sources of heat made by people.

Examples of artificial sources of heat.

- Lamps
- Bulbs
- Candles

Uses of heat to man

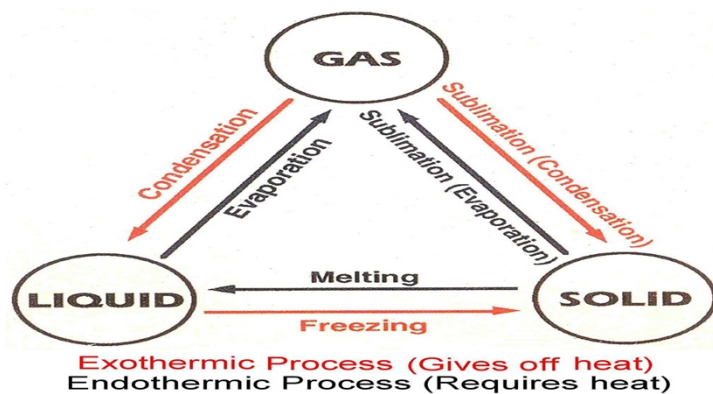
- used for ironing clothes
- Heat is used to run some machines e.g. steam engines. Diesel engines, rockets etc.
- used to dry harvested crops before storage.
- Heat evaporates the water in water bodies and plants during rain formation
- Heat enables us to cook our food
- Heat can act as a disinfectant.

Effects of heat on matter

Heat causes the following effects to matter.

- Melting.
- Expansion.
- Evaporation.
- Sublimation.

Diagram to show physical changes of state of matter.



- A** - Melting physical change from solid to liquid
- B** - Evaporation physical change from liquid to gas.
- C** - Freezing physical change from liquid to solid.
- D** - Condensation – Physical change from gas to liquid
- E** - Sublimation physical change from solid to gas.
- F** - Sublimation physical change from gas to solid.

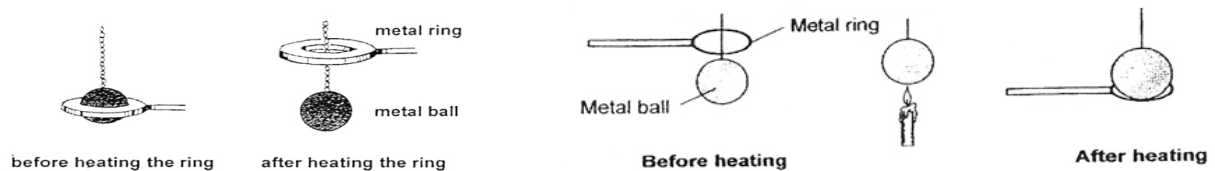
EFFECTS OF HEAT ON EACH STATE OF MATTER.

SOLIDS.

- Metals expand.

Metallic ball ring experiment

- a). Before heating the metallic ball goes through the ring.



b). after heating the metallic ball does not pass through the ring

Reasons why metallic ball did not go through the ring after heating

The metallic ball had expanded

Conclusion

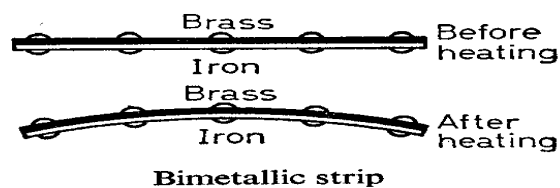
Metals expand when heated

What do you think can happen to the metallic ball if dipped into cold water?

The hot metallic ball will contract and pass through the ring again.

Bimetallic strip.

Before heating and after heating



Observation

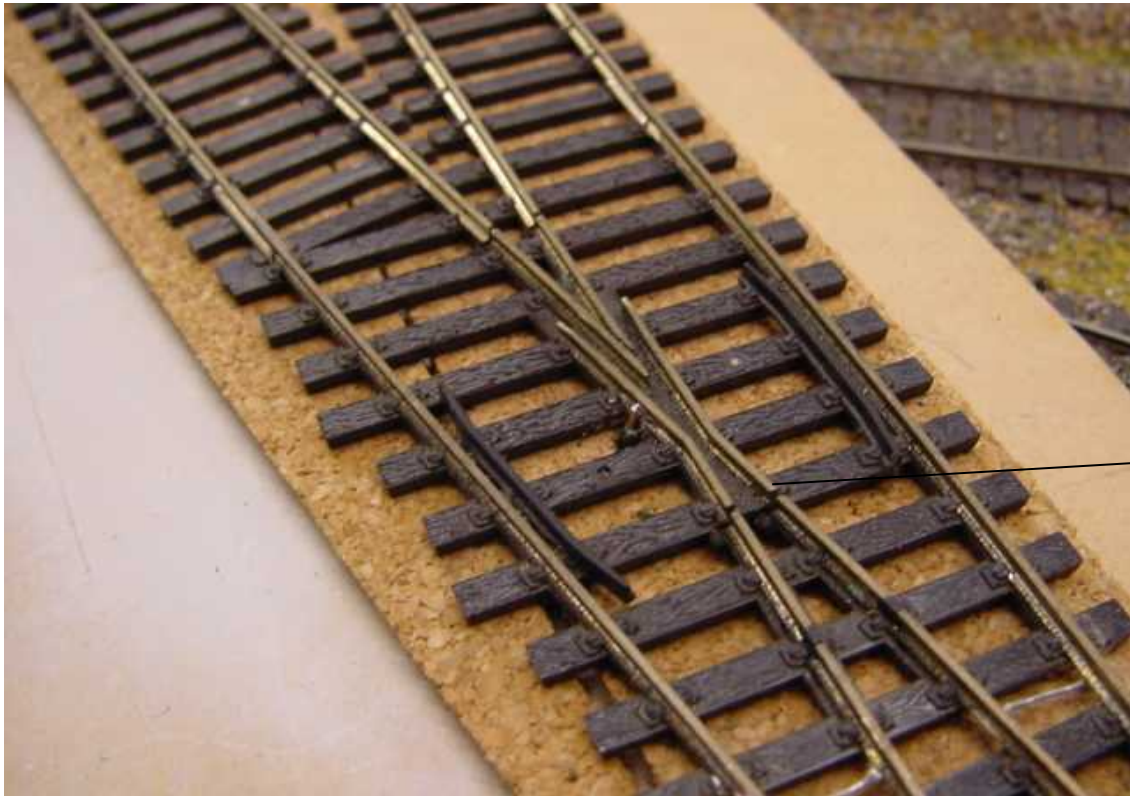
The iron strip heats up and expands faster than the copper strip hence bending towards the copper.

Qn: 1. which of the two metals is the best conductor of heat?

IMPORTANCE OF A Bimetallic.

- Bimetallic strips are used in automatic switches of electric kettles, flat irons, fridges, freezers etc.

illustration of a railway line showing the gaps left during construction.



Qn: What happens if gaps were not left between rails during construction?

The rails would expand on hot days bend and cause railway accidents.

2. Why are gaps left between railways during construction?

To leave room for expansion on a hot day.

Diagrams to show the effect of heat on electric / telephone wires

On a hot day.



Electric / telephone wires expand become loose and starts sagging / slacking.

On a cold day wire contract and become shorter appearing relatively tight.



Qn; 1. Why are electric / telephone wires left sagging during construction?

To allow room for contraction on cold days.

2. What would happen to the wires when tied tightly on the poles?

The wires would break due to contraction on cold days

EFFECTS OF HEAT ON ICE.

What happens to ice when heated?

- Ice melts

- The volume decreases, the density increases and the mass remains the same.

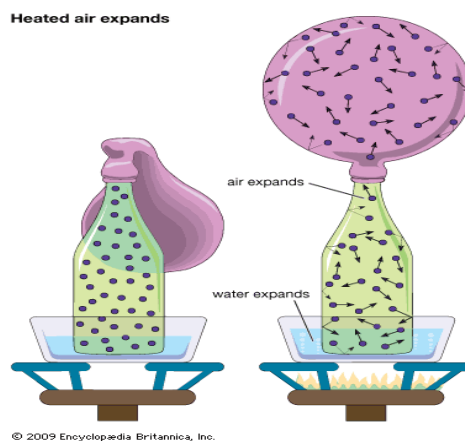
EFFECTS OF HEAT ON GASES

What happens to gases when:-

a). Heated - Gases expand

b). Cooled - Gases contract

EXPERIMENT TO SHOW THAT GASES EXPAND WHEN HEATED.



QN:1. Why does the balloon in diagram A expand?

Due to expansion of air inside the plastic bottle.

3. What happens to the balloon when the bottle is removed from the hot water?

The balloon collapses due to contraction of the air inside the plastic bottle.

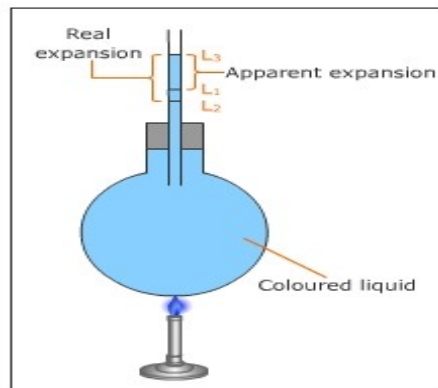
Effects of heat on liquids

- Liquids expand when heated.
- Liquids evaporate when heated.
- Liquids contract when cooled

Effects of freezing of liquids

- Liquids increase in volume
- Liquids reduce in density
- Mass of liquids remains the same.

Diagram to show that liquids expand when heated.



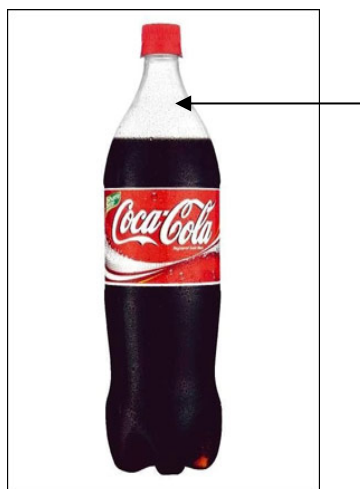
Qn: 1. why is space left while bottling drinks like soda?

To leave room for increase in volume when frozen.

2. Why is carbon dioxide packed in bottled drinks like soda?

To preserve the soda.

A BOTTLE WITH THE SPACE LEFT



Effects of heat on sublimates

NB: Sublimates are substances which can directly change from solid to gas.

Examples of sublimates

- i. Iodine granules (crystals)
- ii. Ammonium chloride(salts)

iii. Solid carbon dioxide.

TEMPERATURE

Is the degree of hotness or coldness of an object.

Standard units for measuring temperature.

Temperature **Degrees**

Instrument used to measure temperature.

Temperature **Thermometer**

Thermometer

Thermometer is an instrument used to measure temperature.

The following thermometer measure the following:-

- Lowest temperature of the day **Minimum thermometer**
- Highest temperature of the day **Maximum thermometer**
- Room temperature or temperature of the air **Wall thermometer**
- Highest and lowest temperature of the day **Six's thermometer**
- Human body temperature **Clinical thermometer**

Places where we find clinical thermometer in daily life

- In clinics
- In hospitals
- In dispensaries

Places or common sites on our bodies where a clinical thermometer can be placed while measuring the human body temperature

- Under the arm pits
- In the anus
- In the mouths / under the tongue

Diagram of clinical thermometer

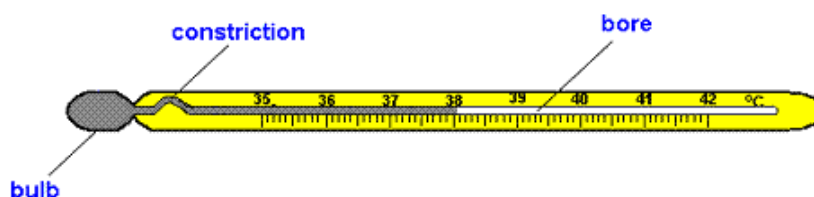


Fig. 10.5

Importance of each part

Stem: Protects the inside parts of a thermometer

Kink: Prevents the back flow of mercury to the bulb before the actual temperature is taken.

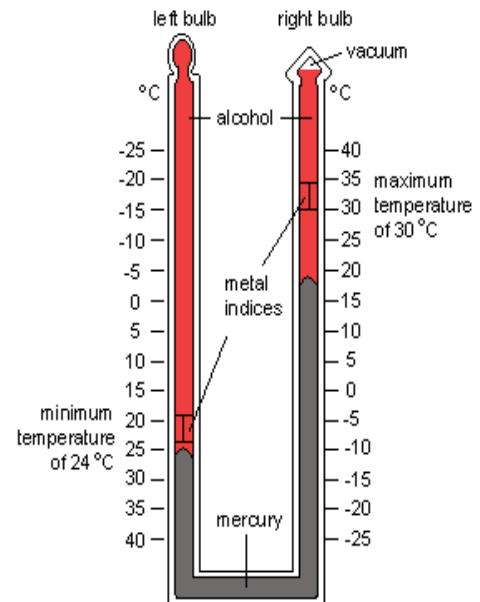
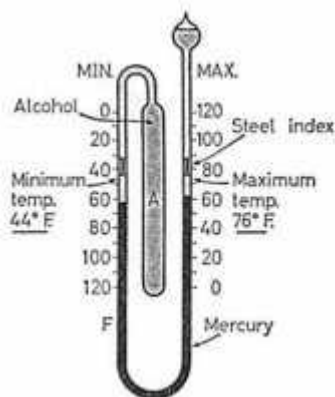
Bore: The bore has a regular scale.

Bulb: The bulb store mercury.

Liquids commonly used in thermometers.

- Alcohol
- Mercury

SIX'S THERMOMETER (MINIMUM AND MAXMUM THERMOMETER)



Reasons why mercury is used in a thermometer

- Mercury is a good conductor of heat
- Mercury does not stick on the walls of the bulb / bore.
- Mercury can easily be seen in the glass.
- Mercury has even and regular expansion.

Reasons why water is not used in a clinical thermometer

- Water is not easily seen
- Water is a bad conductor of heat
- Water needs a lot of heat to expand.
- Water's does not expand uniformly.

Why do doctors shake a clinical thermometer before using it on other patients?

- To draw the mercury back to the bulb

Reason why a clinical thermometer is sterilized using surgical spirit

- Boiling it will make the stem expand and burst.

The normal human body temperature

- Celsius 37⁰c.

- 98.6/ 98.4degrees Fahrenheit.

Changing from Celsius to Fahrenheit

a. 20⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (20 \times \frac{9}{5}) + 32$$

$$F^0 = (4 \times 9) + 32$$

$$F^0 = 36 + 32$$

$$\underline{^0F = 68^0}$$

b. 25⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (25 \times \frac{9}{5}) + 32$$

$$F^0 = (5 \times 9) + 32$$

$$F^0 = 45 + 32$$

$$\underline{^0F = 77^0}$$

c. 5⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (5 \times \frac{9}{5}) + 32$$

$$F^0 = (1 \times 9) + 32$$

$$F^0 = 9 + 32$$

$$\underline{^0F = 41^0}$$

d. 0⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (0 \times \frac{9}{5}) + 32$$

$$F^0 = (0 \times 9) + 32$$

$$F^0 = 0 + 32$$

$$\underline{^0F = 32^0}$$

e. 80⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (80 \times \frac{9}{5}) + 32$$

$$F^0 = (16 \times 9) + 32$$

$$F^0 = 144 + 32$$

$$\underline{^0F = 176^0}$$

f. 100⁰c

$$F = (c \times \frac{9}{5}) + 32^0$$

$$F^0 = (100 \times \frac{9}{5}) + 32$$

$$F^0 = (20 \times 9) + 32$$

$$F^0 = 180 + 32$$

$$\underline{^0F = 212^0}$$

Changing temperature from Fahrenheit to Celsius

Example 41⁰F to C⁰

$$C^0 = (F - 32) \times \frac{5}{9}$$

$$C^0 = (41 - 32) \times \frac{5}{9}$$

$$C^0 = (41^0 - 32) \times \frac{5}{9}$$

$$C^0 = 9 \times \frac{5}{9}$$

$$C^0 = 1 \times 5$$

$$\underline{C^0 = 5^0}$$

Change 68⁰F to C⁰

$$C^0 = (F - 32) \times \frac{5}{9}$$

$$C^0 = (68^0 - 32) \times \frac{5}{9}$$

$$C^0 = 36 \times \frac{5}{9}$$

$$C^0 = 4 \times 5$$

$$\underline{C^{\circ} = 20^{\circ}}$$

Change 32°F to C°

$$C^{\circ} = (F - 32) \times \frac{5}{9}$$

$$C^{\circ} = (32^{\circ} - 32) \times \frac{5}{9}$$

$$C^{\circ} = 0 \times \frac{5}{9}$$

$$C^{\circ} = 0 \times 5$$

$$\underline{C^{\circ} = 0^{\circ}}$$

Change 59°F to C°

$$C^{\circ} = (F - 32) \times \frac{5}{9}$$

$$C^{\circ} = (59^{\circ} - 32) \times \frac{5}{9}$$

$$C^{\circ} = 27 \times \frac{5}{9}$$

$$C^{\circ} = 3 \times 5$$

$$\underline{C^{\circ} = 15^{\circ}}$$

Change 95°F to C°

$$C^{\circ} = (F - 32) \times \frac{5}{9}$$

$$C^{\circ} = (95^{\circ} - 32) \times \frac{5}{9}$$

$$C^{\circ} = 63 \times \frac{5}{9}$$

$$C^{\circ} = 7 \times 5$$

$$\underline{C^{\circ} = 35^{\circ}}$$

Change 77°F to C°

$$C^{\circ} = (F - 32) \times \frac{5}{9}$$

$$C^{\circ} = (77^{\circ} - 32) \times \frac{5}{9}$$

$$C^{\circ} = 45 \times \frac{5}{9}$$

$$C^{\circ} = 5 \times 5$$

$$\underline{C^{\circ} = 25^{\circ}}$$

HEAT TRANSFER

How heat travels through the states of matter

1. Solids by Conduction
 2. Liquids by Convection
 3. Gases by Convection
- Vacuum by Radiation

Vacuum

A vacuum is a space without molecules.

Importance of molecules in heat transfer

- Molecule act as a medium of heat transfer.

Qn: In which state of matter does heat travel?

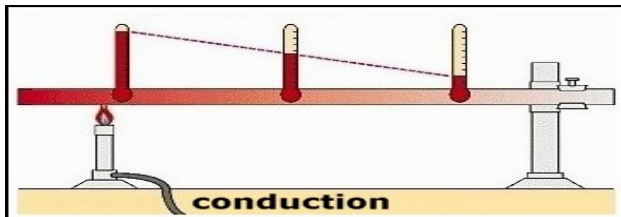
A) **Fastest** – gases

Why? The molecules in gas state move freely than any other state of matter.

Slowest – Solids

Why? The molecules do not move freely.

An illustration of heat transfer in solids



Qn: 1. how does heat move from point B to point A?

By conduction

2. Which of the above wax will melt first?

Wax 1.

Reason: Wax 1 is nearest to the flame

3. Which of the above wax will melt last?

Wax 4

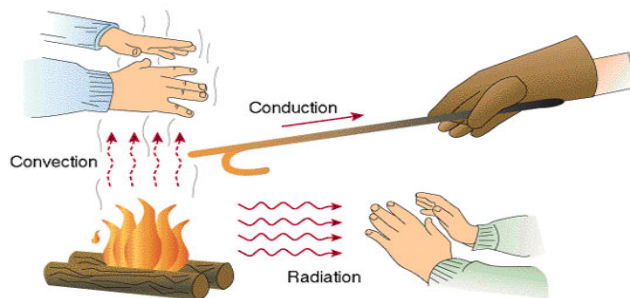
Reason: wax 4 is furthest from the flame.

Importance of heat transfer by conduction

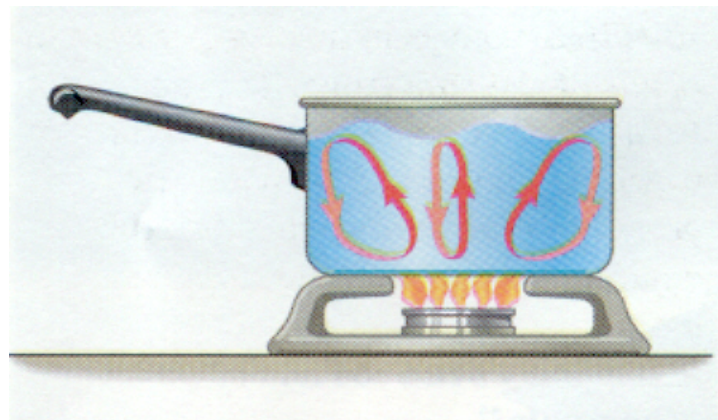
- Ironing our clothes using hot bodies like flat irons, iron boxes.
- Cooking food.
- Boiling water in a kettle.
- Welding or smelting metallic objects.
- Roasting meat using an iron rod.

Diagram to show convection of heat

a) in gases.



b) liquids



Importance of convection in our daily life

- helps smoke to move out of the kitchen through the chimney.
- Convection current helps in free circulation of fresh air in our houses.
- Convection currents help in formation of breezes.
- Taking of bad smell through the vent pipes of a VIP latrine.

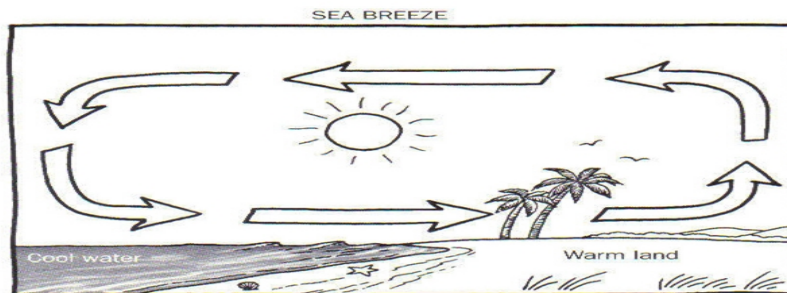
Importance of each of the following on a house.

- 1. Ventilators:** let out warm air
- 2. Windows:** let in fresh air
- 3. Doors:** let in fresh air

SEA AND LAND BREEZE.

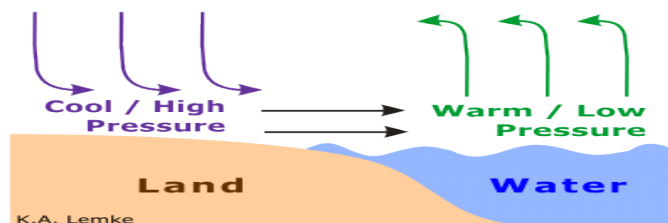
Sea breeze.

It is when cool gentle current from the sea moves to the land to replace the warm risen air. It occurs during day.



land breezes.

It is when cool gentle current from the land moves to the sea to replace the warm risen air. It occurs at night.



Nb: Sea breeze brings cool fresh air on land.

RADIATION.

It is the process by which heat passes through a vacuum.

QN: How does a person standing in Namboole on sunny day receive heat from the sun?

By radiation.

Importance of heat transfer by radiation in the environment

- Radiation is used while roasting meat, fish or chicken in an oven.
- Warming our bodies using warmers or heaters.
- Dries harvested crops / wet clothes on wires.

Reflectors and absorbers of heat.

Reflectors: are shiny surface that reflect heat and light

Absorbers: are dull / black surface that absorb heat and light.

Examples of reflectors

- Mirrors
- Glasses

Absorbers

- Black clothes
- Black cars

Why are most houses, vehicles and fridges in most tropical countries like Uganda painted white? **To reflect heat**

If John washed a black and a white shirt and spread under sunshine;

- a. Which shirt would dry first? **The black shirt.**

Reason: Black absorbs a lot of heat.

Last? The white shirt

Reason: The white shirt would reflect heat.

Conductors and insulators of heat

Good conductors: - are materials which allow heat to pass through them easily.

Examples of good conductors of heat

- | | | |
|----------------|------------|-------------|
| i. Iron | iv. Brass | vii. Silver |
| ii. Mercury | v. Zinc | viii. Lead |
| iii. Aluminium | vi. Copper | |

Insulators of heat

Insulators are the materials which don't allow heat to pass through them easily.

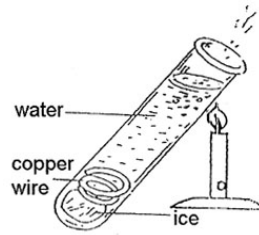
OR

Insulators are bad (poor) conductors of heat

Examples of bad conductors of heat

- i. Distilled Water
- ii. Rubber
- iii. Plastic
- iv. Paper
- v. Cotton wool
- vi. Cloth
- vii. Sponge. etc

Experiment to show that water is a poor conductor of heat



Observation

- Ice did not melt
- The water will boil at the area being heated while the ice cubes at the bottom will remain unmelted.

Use of conductors

- Used to make saucepans
- Used to make kettles
- Used to make bottoms of iron boxes

Insulators

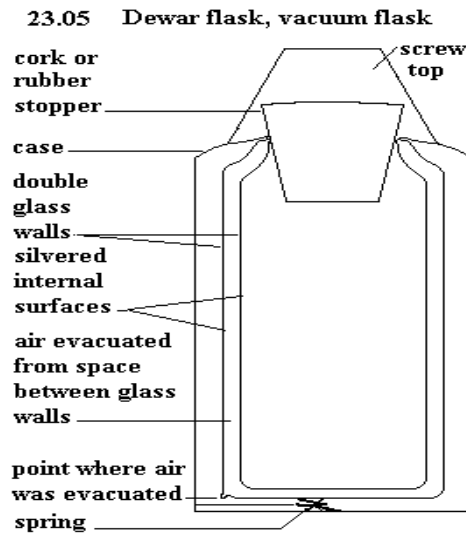
- Paper is used to make cards
- Cloth keeps us warm
- Cork prevents heat loss in a vacuum flask.
- Why are handles of iron boxes, frying pans, flat irons made of wood, rubber / plastics?

To prevent the user from getting burnt.

A VACUUM FLASK (THERMOMETER FLASK)

A vacuum flask keeps hot things hot and cold things cold.

A DIAGRAM OF A VACUUM FLASK



Uses of each part of a vacuum flask

Cork: Prevents heat loss or gain by conduction.

Silvered surfaces: prevents heat loss or gain by radiation (a good reflect of heat).

Vacuum: Prevents heat loss or gain by both conduction and convection.

Felt (cork base): Absorbs shocks to prevent the glass from breaking.

Felt are also poor conductors of heat.

Vacuum seal: Prevents matter form entering the vacuum.

OCCUPATIONS IN OUR COMMUNITY: CROP GROWING

CROP GROWING

ROOT CROPS

Root crops are crops that store their food in the swollen underground roots.

Examples of root crops

- Cassava
- Sweet potatoes
- Carrots
- Yams

STEM TUBERS

Are crops which store their food in swollen underground stems.

Examples of stem tubers

- Coco yams
- Irish potatoes

Which food values do we get from eating mostly root crops.

We get carbohydrates.

How are the following crops propagated?

Crop	Propagation
Cassava	By planting stem cuttings
Sweet potatoes	By planting vines / stem cuttings
Carrots	By planting carrot seeds
Yams	By planting the roots

CARING FOR ROOT CROPS

1. By weeding the root crops (removing unwanted crops from the garden)

Importance of weeding

- To reduce competition for sunlight, water and mineral salts between weeds and crops.
- To prevent easy spread of pests and diseases from the weeds to crops
- Improve the crop yields

2. Pruning the crops (cutting off excess or poorly growing plants)

Importance of pruning

- To reduce over weight on the plants
- To prevent competition for sunlight carbon dioxide and oxygen
- Pruned materials can be used as mulches in the garden

Garden tools used for pruning crops

- Pruning saw
- Secateurs

3. Thinning (removal of excess or poorly growing seedlings / crops in a nursery bed /garden)

Importance of thinning

- Creates space for the crops to grow well.
- Improves on the yields.
- There is less competition for nutrients from the soil
- Reduces hiding places for the crop pests

- The crops are easily sprayed with pesticides.

How is thinning done in the garden

- By uprooting unwanted crops manually
- Watering the crops (providing water for the plants to prevent withering wilting /drying up)
- The garden tool used for carrying water and watering the crops is called the watering can.

NB: We can also use an over head sprinkler or dig channels to allow the flow of water to the crops in the garden.

4. Plant training /staking.

To grow in a desirable direction using strings and sticks

Examples of crops that can be trained /staked

- Tomatoes
- Passion fruits
- Vanilla

ROOT CROP PESTS AND DISEASES

Pests:

Pests are living organisms that destroy crops e.g. birds, worms, insects, rodents etc

Diseases:

Diseases are illness /sickness in living organisms i.e. plants and animals.

A TABLE SHOWING THE PESTS AND DISEASE THAT AFFECT VARIOUS ROOT CROPS

No	Root crops	Pests	Diseases
1.	Cassava	Whitefly, monkeys, cassava scale, green cassava mites, caterpillars, wild pigs, rodents e.g. moles	Cassava mosaic, leaf spot, bacterial blight
2.	Sweet potatoes	Eel worms, caterpillars, sweet potatoes, weevils, wild pigs, monkeys, rodents	Potatoes blight, bacterial wilt sweet potato mosaics
3.	Carrots	Aphids, moles, eel worms, cut worms, root knot,	Bacterial wilt, leaf spot, a leaf rust

		nematodes	
4.	Yams	Termites, Locusts, Mole, Yam beetles	Leaf spot and leaf rust (fungi)

CHARACTERISTICS OF ROOT CROP PESTS

- Pests which damage the shoot system (leaves and stem /braches) have strong mouth parts to cut and chew the leaves.
- Pests which destroy the tubers have sharp claws which help them to dig the soil
- They have sharp incisors which bite or cut the roots /tubers.
- Other pests that damage root crops have fingers which they use to uproot the root crops e.g. apes and monkeys.

Examples

- Locusts
- Caterpillars
- Army worms
- Sweet potatoes weevils
- Variegated grasshoppers

HOW TO CONTROL CROP PESTS

- By spraying the crops with pesticides.

Dangers of pests to crop farmers

- Pests damage farmer's crops
- Reduce on the crop yields
- Cause decaying root crops
- Wastes money to control

Uses of pests to farmers

- Some pests are a source of food to man e.g. grasshoppers and locusts.
- Some are eaten by farmer's poultry e.g. caterpillars

FOUR MAJOR CONTROL METHODS OF PESTS

1. Mechanical control method

E.g

- physical guarding (Fencing the garden)
- Silting traps /scares

- Staying scary crows

The above methods can control pests like wild pigs, moles, birds, rodents etc

2. Biological pest control

This is where a predator is used to control the pests e.g. you can tame a cat to kill rats.

3. Cultural methods

- By practicing crop rotation
- The available pests of a particular crop
- Early planting and harvesting
- Practicing resident species /varieties
- Through proper control of weeds
- By planting disease free cuttings /vines
- Chemical control method; is a method where a farmer sprays pesticides /insecticides to kill the pests

HARVESTING AND STORAGE OF ROOT CROPS

Harvesting

Harvesting is the removal of mature and ready crops from the garden.

Storage

Storage is the keeping of harvested crops safely for future use

Sweet potatoes

- Mature within the first six months after planting.
- However, first growing varieties mature within three months
- Potato tubers do not mature at the same time, but keep growing as you harvest the ready /mature tubers.
- Ready sweet potatoes make cracks in the soil
- Farmers spot the cracks and harvest the ready tubers using sharp sticks or sharp pointed metal rods.
- Sweet potatoes tubes can as well be harvested at once using hoes mostly for scale.
- Harvested tubers can be peeled, cooked and eaten immediately
- The surplus can be sold in market or sliced into tiny pieces, dried and stored in cool /dry places.

Cassava

- Some varieties take 6 months to mature others take up to 1 year.
- During harvesting the whole plant is dug out using a hoe and tubers removed
- While preparing cassava for eating, you peel using a knife, wash, cook and eat.
- Surplus cassava can be sold off in markets or slices and dried before storage or dried slices can be pounded to make cassava bread or pan cakes, local beer (kwete), local glue.

Methods of storing root crops

- Temporary storage e.g. burying the tubes under wet soil
- Long time storage (after drying the slices) e.g. storing in granaries /sacks /slices (modern stores)

KEEPING AND USING FARM RECORD

Farm records

These are details or information concerning all activities that take place on a farm.

Example of farm records used on root crops

- Farm inventory e.g. farm equipment size of lands.
- Cash record e.g. money spend or received when carrying out the project
- Non-cash records – unpaid for labour may be family members
- Records of production e.g. number of acres planted /map of the farm

Importance of keeping farm records

- To know the progress of the farm
- Proper records can be used to get loans in the bank
- To plan for the farm for future use
- To know whether the farmer is making profits or losses.

SPECIMEN OF FARM RECORDS SHEET

<i>Date</i>	<i>Crop planted</i>	<i>Date of weed control</i>	<i>Date of manuring</i>	<i>Date of harvest</i>	<i>Date of sale</i>
2/2/2005	cassava	3/3/2005	3/4/2005	7/7/2005	13/5/2005

SCIENCE CLUBS /SOCIETIES IN THE SCHOOL

The science club

Involve learners in science related activities

Examples of Science related societies.

- Wildlife clubs
- Red cross clubs
- Young farmers clubs
- Science contest
- Science exhibition
- Science quizzes
- Science projects
- Science paper presentation etc

Importance of science activities to learners

- Develop a positive attitude in learners towards science.
- Expose learners to the kind of work that can lead to their career
- Shape learners for their future career in the science field i.e. doctors, engineers, surgeons, dentists, electricians, and agriculturalist.

Wildlife club

Enables learners to learn more about uncultivated plants and wild animals that exist in the natural environment.

Roles of the wild life club

- Protecting the environment.
- Conserving the environment.
- Teaching or sensitizing others to protect or conserve the environment.

Activities done by the wildlife clubs in school

- Maintaining a free nursery in the school
- Tree labeling
- Establishing wood / tree projects
- Monitoring wildlife abusers e.g. poachers
- Bird watching
- Preventing water, air and soil pollution
- Setting up a botanical garden
- Construction of an aquarium

Aims of the science oriented clubs in school

- To promote /boost children's interests in the science subject
- To enable children to know how scientists work.
- To equip learners with knowledge and skills for their future career.
- To promote learning of science in the school.

The young farmers clubs

The young farmers clubs include young boys and girls in and out of school who are interested in farming.

Roles of the young farmers clubs

- To keep animals and grow crops.
- To teach other farmers better farming methods.

Qn: When are the activities of young farmer's clubs done?

- After school time

Qn: Under which department / ministry in Uganda are the young farmers clubs

- Department of agriculture

Role of the department of agriculture in young farmers clubs

- To unite all the young farmers' clubs in the country.
- To set up competitions in school where prizes are given to winners.
- Train and send technical people to teach and answer questions of the young farmers.
- To teach young farmers better farming methods.
- To start money making and savings projects for self support.

Topical questions

1. How can root crops be cared by crop farmers
2. Give any two examples of stem tubers
3. State the importance of farm records on a crop farm
4. Identify the main role of the wildlife club in a school like greenhill
5. Which is the best season for crop growing
6. How are the following crops propagated
 - Sweet potatoes
 - Cassava
 - Carrots
7. Which food value is mostly obtained from root crops
8. Give the difference between a pest and a parasite.

BACTERIA AND FUNGI

Bacteria means a microscopic single celled organism that are present almost every where.

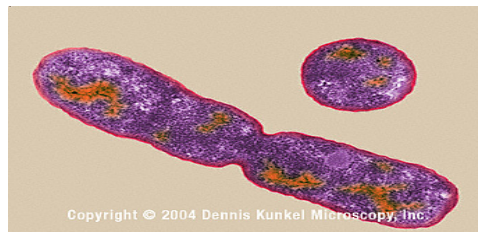
Places where bacteria are mostly found

- Animal bodies
- Contaminated water and air
- Soil
- Nodules of legumes
- Latrines
- Rubbish pits

How do bacteria reproduce

1) By cell division (binary fission)

Diagram

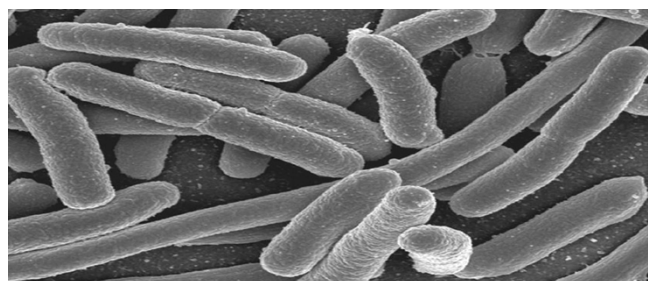


Types of bacteria

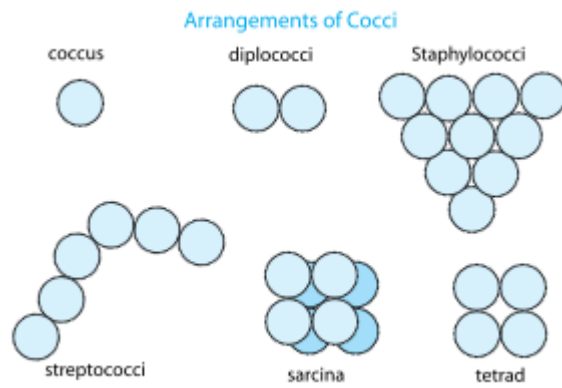
- i. Rod shaped bacteria (bacilli)
- ii. Spherical shaped bacteria(cocci)
- iii. Spiral shaped bacteria

1. Rod shaped bacteria (bacilli)

e.g bacillus anthracis for anthrax, salmonella typhi for typhoid



2. Spherical shaped bacteria(cocci) e.g staphylococci for boils, streptococcus for sore throat, diplococci



3. **spirochaete** for syphilis



4. **Coma shaped bacteria (vibrios)**



Importance of useful bacteria

1. Nitrogen fixing bacteria fix nitrogen back into the soil to improve soil fertility
2. Bacteria break or digest fibre food/ roughage / cellulose in the caeca of birds
3. Bacteria help in decomposition / rotting of dead plants and animals
4. Bacteria help too reduce on the amount of faeces in pit latrines as well as sewage tanks

5. Bacteria help in fermentation of beer, ghee, yoghurt and cheese.
6. Bacteria help in making humus (manure) in compost pits)
7. Bacteria help to reduce on the amount of garbage as they rot.

Dangers of harmful bacteria

1. Harmful bacteria cause diseases to both animals and plants.
2. Bacteria cause poor yields to crops
 4. Bacteria cause food poisoning
 5. contaminates food and makes it poisonous to human health
 6. Some cause diseases.

How to control dangers caused by harmful bacteria

- i. by preserving food(keeping food free from bacteria)
- ii. by observing proper food hygiene i.e. ensuring that food is kept in a clean environment and clean containers
- iii. by using antiseptics(drugs that kill germs on cuts and wounds)e.g. detol, saloon, hydrogen peroxide tincture of iodine etc
- iv. by sing disinfectants to kill bacteria in places like bacteria and reduce the bad smell e.g. harpic, jeyz , etc
- v. by using antibiotic (drugs used to kill bacteria in our bodies) inform of injections, tablets, capsules, syrups e.g. penicillin from penicillium) that was discovered by Alexander Fleming, etc
- vi. through sterilization of medical instruments e/g springs
- vii. through pasteurization (involves) heating the food stuffs to a high temperature and sealing it before suddenly cooling it)

it was discovered by Dr. Louis Pasteur to preserve milk. He also discovered the vaccines against anthrax and rabies.

FUNGI

Fungi are simple organisms that obtain their food from decaying plants and animal matter.

Fungi are saprophytes because they feed saprophytic ally (obtain soluble food from dead organic matter)

Examples of fungi

- Mushrooms

- Moulds
- Yeasts
- Puffball
- Toad stools (poisonous fungi)

Characteristics of fungi

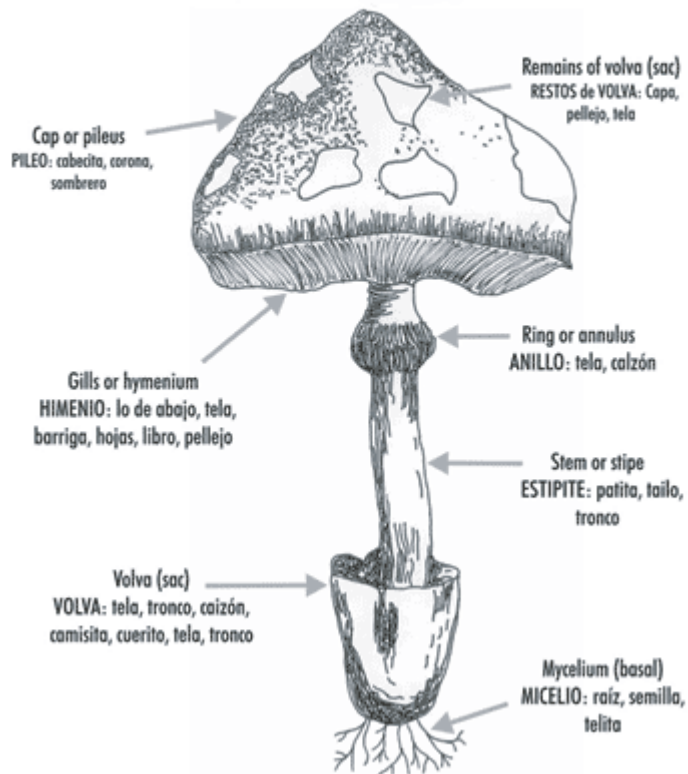
- Fungi exist in both as single celled (unicellular) or multicellular organisms.
- Fungi lack chlorophyll (they can make their own food)
- Fungi feed saprophytically or parasitically
- They have nuclei in their cells

Importance of fungi

- Some fungi like yeast are used to bake bread and cakes
- Some fungi like mushrooms are a source of food to man
- Some fungi like moulds (penicillium rotatum) are used to make penicillium
- Yeast is used to brew local beer or ferment fruit juices to make wine
- Fungi help in decomposition of rubbish in rubbish pits to make humus
- Yeast is used to flavors cheese
- Yeast is a source of vitamin B that prevents beriberi

Mushrooms

Scientific and popular names for the parts of a mushroom



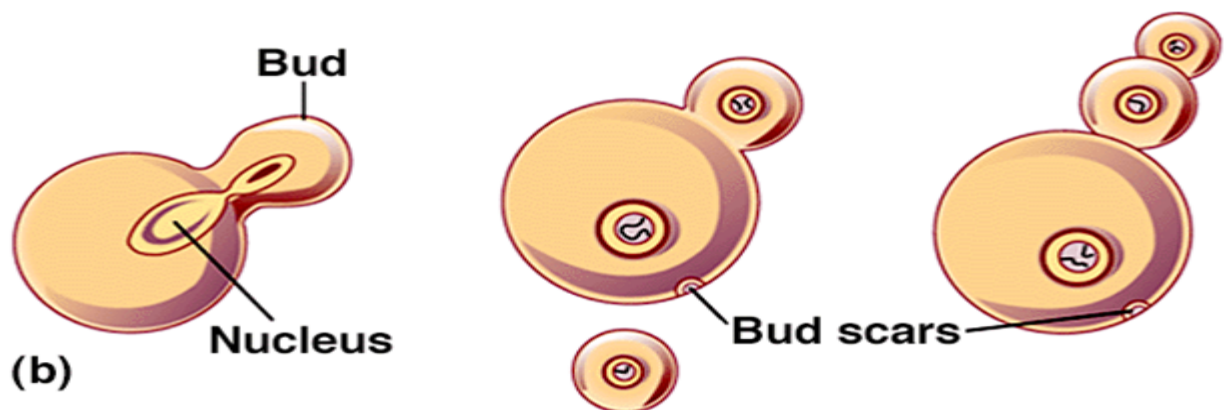
IMPORTANCE OF MUSHROOMS.

- They are eaten as food.
- Some mushrooms are sold to get money.
- Mushrooms are used for study purpose.

How do fungi reproduce?

Most fungi reproduce by means of **spores** unlike Yeast which reproduces by **budding**

Diagram



Danger of harmful fungi

- Harmful fungi cause food poisoning
- Harmful fungi cause a number of diseases to both plants and animals

Examples of fungal diseases in animals

- Ring worms (cause round patches on the skin)
- Athletes foot (attacks the skin between the toes)
- Thrush caused by candida
- Finger nail deformation

Examples of fungal diseases in plants

- Panama e.g. banana
- Cigarand rot
- Blast wilt
- Coffee berry disease (rust) coffee plant
- Root rot in tea plants.

How to control the dangers caused by harmful fungi

- Boiling milk and water before drinking.
- Reheating and warming cold food before eating it.
- Salting the food.
- Pickling – putting vinegar in edible vegetables and other foods.
- Avoid eating uncovered food.
- Spray plants with fungicides.
- Get early treatment for any fungal infection /disease.
- Sterilize all surgical instruments to kill all the germs.
 - Irradiation in canned foods.
- Avoid eating or catching poisonous fungi.
- Proper management of house refuse and rubbish
- Proper use of the latrine.
- Avoid sharing towels, socks, under wears etc.
- Use medicated soap to bathe e.g. detol , protex, etc.
- Use disinfectants in cleaning toilets e.g. jeyz.

Similarities between bacteria and fungi

- Both feed saprophytic ally
- Both cause fermentation
- Both can cause rotting /decomposition
- Some of them cause diseases while others are useful to man

- Some are single celled while others are multicellular

Differences between bacteria and fungi

- Bacteria reproduce by means of cell division (binary fission) while fungi reproduce by means of budding and spores.

- All bacteria are very tiny microscope while some fungi like mushrooms are big

- Bacteria reproduce much faster than fungi

- Some bacteria make their own food by combing some simple chemical substance while fungi cannot make their own food

Topical questions

1. How are bacteria different from fungi?

2. Where are bacteria found in our environment?

3. Name any one poisonous fungi

4. Give the three types of bacteria

5. Which bacteria do the following?

a) Add nitrogen back into the soil

b) Make food go bad

c) Cause typhoid

d) Cause cholera

6 Identify any two immunisable disease caused by bacteria

7 How do the following reproduce?

a) Yeast

b) Bacteria

8 Give the importance of fungi to people

9 How are bacteria useful to people?

10 In the space below, draw a mushroom and label all the parts

Mixture

A mixture is when two or more different substance are mixed together e.g.
when we mix sand and cement we get concrete blocks

Dissolving substance/ solutes.

These are substances that dissolve when put in water/ any liquid after stirring.

So, solutes are soluble in water or the liquid

Examples of solutes.

- Sugar
- Salt
- milk powder

Insoluble substances.

Substances which don't completely dissolve in any liquid or water.

e.g. sand, maize flour, stones etc

A suspension: is a substance where the solute does not completely dissolve in

the solvent.

Solvent.

Is a substance in which a solute dissolves.

Examples.

- water
- petrol
- methylated spirit

Nb: Water is universal solvent because it dissolves almost all solutes.

solution.

Is a uniform mixture of a solute and solvent.

saturated solution is a solution which dissolves more solutes after heating it.

Super saturated solution is a solution which cannot dissolve any more solute even offer heating it.

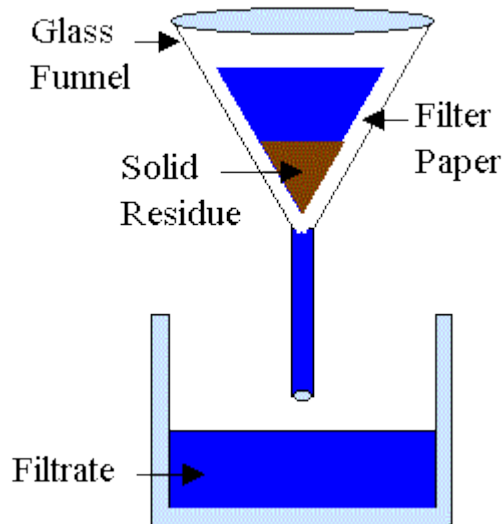
SEPARATION OF MIXTURES.

1. Filtration.

It is a process of separating solid particles from a liquid using a filter.

The solid particles that remain in the filter are called **residues.**

The liquid that passes through is called **a filtrate.**

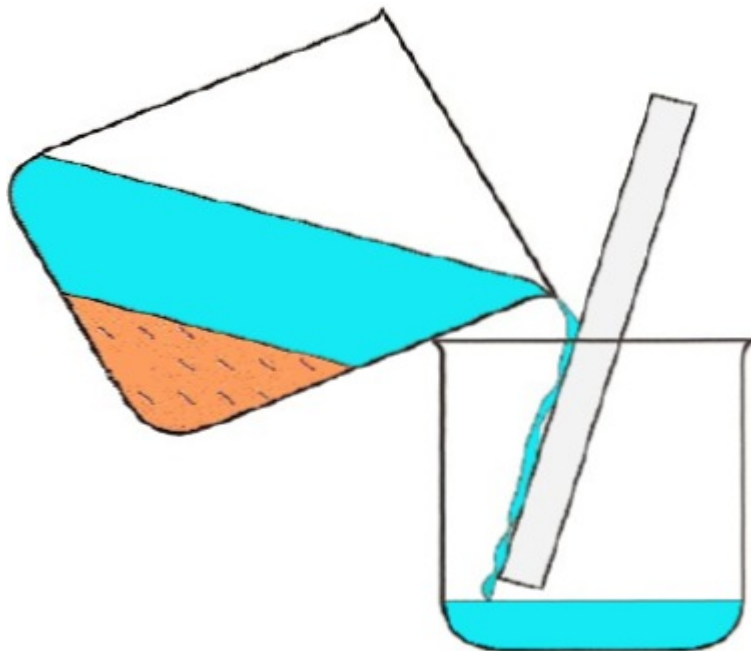


How filtration method can be applied in our homes.

1. When separating passion, orange, etc fruit juice from the seeds.
2. When separating clear water from muddy water.

2. Decantation.

It is when solids particles are allowed to settle at the bottom of a liquid then a liquid is carefully poured off to separate it from the solid particles.



The solid particles that remain in the one container is called a **residue**.

The liquid that is collected in another container is called a **decantee**.

How decantation method can be applied in our homes.

1. When separating passion, orange, etc fruit juice from the seeds.
2. When separating clear water from muddy water.

Qn: Why is it important for one to first shake a syrup before taking it?

For the medicine to mix with the liquid that has settled at the top.

3. Distillation.

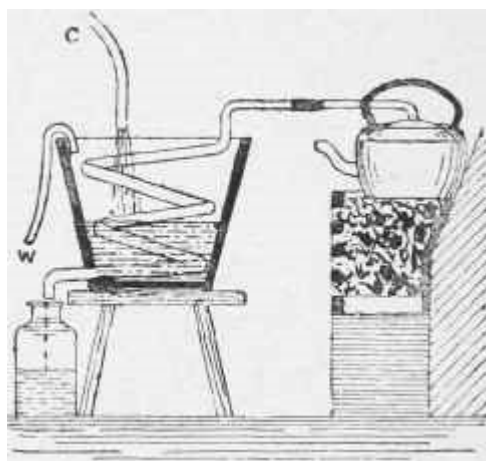
It is the making of dirty water pure by evaporation and condensation.

Nb: Distilled water is not good for drinking because lacks mineral salts.

The substance that remains in the container is called **a residue.**

The substance that is collected in the second container is called **a distillate.**

Distilled water is used to mix drugs in hospitals.



SEPARATION OF MIXTURES OF SOLIDS.

1. Flootation.

It is a method of separation of mixtures where one sinks and the other floats.

2. Using magnets to separate metallic objects from non metallic objects.
3. Hand picking / sorting.

TERM THREE

LESSON 1

TYPE OF CHANGES

Environment: These are people and their surrounding of people.

Types of changes in our environment

- | | |
|----------------------|-------------------------|
| i. Physical changes | iii. Biological changes |
| ii. Chemical changes | iv. Atmospheric change |

Biological changes: Are changes that take place in our body cells and affect the growth.

Examples of biological changes

Growth	Moulting
Germination	Flowering
Fertilization	Fruiting etc.

Characteristics of biological changes

- New organisms come into being e.g. young ones of animals, seedlings in plants.
- Young ones grow old.
- Increase in number of off springs
- Increase in harvest / yields.

Chemical changes

These are changes where a new substance is formed or

Chemical changes are changes which are irreversible

Characteristics of chemical changes

- A new substance is formed
- They are irreversible
- Heat or light is sometimes given off or absorbed
- The amount size and weight of the object changes.

Examples of chemical changes

- | | |
|-----------|-----------|
| • Burning | • Rusting |
|-----------|-----------|

- Respiration
- Digestion
- Photosynthesis

Advantages of chemical changes

- Chemical changes like burning produce heat
- The heat produced is used to cook
- Production of energy during respiration

Disadvantages of chemical changes

- Rusting results into wearing out of iron materials, steel equipment
- Bolts become difficult to open or unscrew.
- Keys fail to fit in the padlock after rusting
- Water and air become poisonous to human life.
- Pollutes the environment ie smoke.

Physical changes

Physical changes are changes where no new substances are formed.

OR

Physical changes are changes which are reversible.

Examples of physical changes

- Evaporation
- Condensation
- Freezing
- Melting
- Sublimation

Characteristics of physical changes

No new substance is formed

Are reversible

No heat or light is given off or absorbed

Advantages of physical changes

- Formation of rainfall
- Formation of ice cubes
- Forms water for drinking

Disadvantages of physical changes

- Results into soil erosion
- Forms gulleys
- Causes loss of soil fertility

Weather changes in the atmosphere (atmospheric changes)

- Humidity
 - Cloudy
 - Rainy
 - Sunny
2. Mention any two types of changes in the environment.
 3. What are physical changes?
 4. Give any two examples of physical changes.

LESSON 2

5. Of what advantage are physical changes to man?
6. Suggest one characteristic of a chemical change.

ACTIVITY

1. In one sentence give the meaning of the word environment.

Natural and people made changes

Natural changes: Means changes that occur by themselves e.g. wind movement, changes in climate e.g. dry season, wet season, and rainfall formation

Man made Changes: Are changes that are caused by man.

Examples of man made changes

- Tree planting
- Deforestation (Tree cutting)
- Bush burning
- Construction of houses
- Road constructio

Effects of changes in the environment to plants and people

a. Mulching

- Control the growth of weeds
- Preserves moisture in the soil
- Improves soil fertility

b. Tree cutting

Effect:

- Destroys the environment
- Exposes soil to agents of soil erosion
- Reduces the amount of rainfall

c. Bush burning

Effects

- Causes Soil erosion.
- Loss of soil fertility
- Exposes soil to agents of soil erosion

d. Building houses

Effects

- Houses protect people and their property from bad weather e.g. rain fall, coldness, sunshine.
- Houses also protect people from thieves and wild animals.

d. Effect of road construction

- Road construction helps to improve transport
- Destruction of vegetation
- Poor roads cause / lead to accidents and damage of vehicles

e. Pollution

Pollution is when toxic substastances are released into the environment.

Pollutants are the materials which pollute the environment.

EXAMPLES OF POLLUTANTS

- Plastics
- Polythene papers
- Oil
- Scraps
- Chemical
- Fumes from industries
- Fumes from cars
- Bush burning

TYPES OF POLLUTION

- Air pollution is when toxic substances are released into the air
- Water pollution is when toxic substances are released into the water
- Land pollution is when toxic substances are released into the land
- Sound pollution is when there is too much noise in the area

GENERAL EFFECTS OF POLLUTION TO THE ENVIRONMENT

- Pollution lowers the quality of the environment
- Pollution leads to respiratory diseases
- Pollution leads to environmental degradation
- Pollution leads to mental retardation.
- Pollution leads to death of organisms in the soil
- Pollution leads to death of aquatic animals.
- Pollution destroys the rain cycle

ACTIVITY

1. Give the meaning of term pollution.
2. Mention the four types of pollution.
3. State any two effects of pollution to man.
4. Briefly explain the term air pollution.

KEEPING GOATS, SHEEP AND PIGS

Common terms used

1. **A nanny goat:** Is a mature female goat.
2. **A Billy goat:** Is a mature male goat.
3. **A kid:** Is any young goat.
4. **Kidding:** Is the act of giving birth in goats.
5. **Browsing:** Feeding on the soft parts of a plant.
6. **Tethering:** Is the system of grazing where an animal is tied on a peg (stake) on a rope.
7. **Heat period:** Is a period when a nanny goat is ready to be mated.
8. **Weaning:** Is the introduction of kids to other foods on addition to milk from the mammary gland.
 - **kidding:** The act of giving birth to kids.
 - **Gestation period:** The period between fertilization and birth in mammals (animals).
 - **Lactation:** Is the milking period in animals.

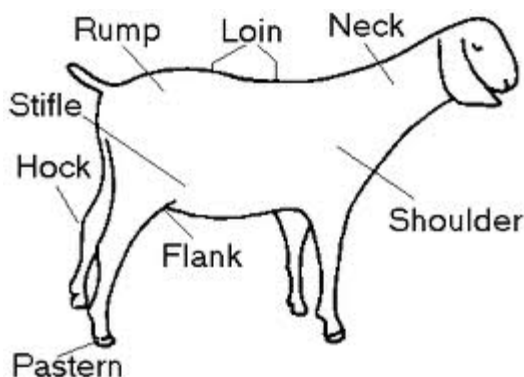
Why farmers keep goats and sheep

1. For milk production.
2. For meat production.
3. For source of income (for sale and get money)

Other uses of goats to man.

1. The skins from goats are used to make leather products like shoes, straps for watches, belts, drum tops, bags and costumes for dancing among others.
2. The dropping from goats is used to make farmyard manure.
3. for giving dowry / bride price.

EXTERNAL PARTS OF A GOAT



ACTIVITY

1. Briefly explain the following terms
 - Anny goat
 - Billy goat
 - Browsing
 - Heat period
1. Why do farmers keep goats?

LESSON4

BREEDS OF GOATS

The two main groups of breeds of goats are:-

- 1) Local breeds (indigenous or native breed)
2. Exotic breeds

Examples of local breeds of goats

- i) Mubende goats
- ii) Golla goats
- iii) Turkana
- iv) Sambaru goats
- v) Anglo– Nubian
- vi) The Somali goat East African small goats

Advantages of local breeds

- i. Local breeds are more resistant to tropical diseases.
- ii. Local breeds can with stand harsh weather conditions.
- iii. Local breeds are easy to manage as they feed by browsing.

Disadvantages

- i) They long to mature
- ii) They provide hard meat.
- iii) They provide less meat and milk.

EXOTIC BREEDS OF GOATS

Exotic breeds are kind of breeds imported into Uganda from other countries.

Examples of exotic breed of goats

- i. Toggenburg
- ii. Angora goats
- iii. Saanen goats
- iv. Boar goats

Meat breeds

- i. Boar goat
- ii. Galla goats

- iii. Mubende
- iv. The Somali goats.

Milk producing breeds

- i. Saanen goats
- ii. Toggenburg

Wool breeds

Angora goats (mohair)

Cross breeds

Somali goats

ACTIVITY

1. Identify any two breeds of goats kept for milk production.
2. Mention two breeds of goats kept for meat .
3. Give any two reasons why people keep goats.
4. What is the gestation period of a nanny goat.

LESSON 5.

Advantages of keeping Exotic breeds of goats.

- i. They grow very fast.
- ii. They fetch a lot of money when sold.
- iii. Produce tender meat.
- iv) They produce a lot of meat and milk.

Disadvantages of keeping exotic breeds.

- i. They are expensive to keep.
- ii. They are not resistant to worms and diseases.
- iii. They cannot withstand harsh weather.
- v. They need special feeds to produce better products.

ACTIVITY

1. What is a breed?
2. Mention two main breeds of goats in Uganda.
3. State any two signs of heat period in goats.
4. What is lactation period?

LESSON 6

BREEDING IN GOATS

- i) A female goat is mated for the first time at the age of 14 – 18 months.

Gestation period of a goat.

The gestation period of a nanny goat is 5 months (150 days)

HEAT PERIOD IN GOATS

Heat period is the time when the nanny goat is ready to be mated by a Billy goat.

Signs of a nanny goat on heat

- i. Becomes restless (unsettled)
- ii. The vulva swells and becomes reddish.
- iii. Whitish discharge from the vulva.
- iv. Mounting other goats.
- v. Standing still when mounted.
- vi. Loss of appetite.

CARING FOR A PREGNANT GOAT

- A pregnant goat needs special care.
- Concentrates should be given one month before kidding.
- These feeds have a high carbohydrates and protein content.
- Mineral licks should be given.
- Pregnant goats should be separated from others and kept in a clean place.
- Weaning should be done at least 3 - 4 months after kidding.

Signs of a good milk breed

- i. It has a large udder and teats.
- ii. Have large milk veins which appear below the belly.
- iii. Have strong and well placed hind legs.
- iv. Have strong back muscles.

ROUTINE JOBS IN GOAT MANAGEMENT

What are routine jobs?

Routine jobs are any good management practices carried out on any livestock farm.

Examples of routine jobs on a livestock farm.

- | | | |
|-------------------|-------------------------|-------------|
| i. Castration | v. Drenching | ix. Culling |
| ii. Disbudding | vi. Spraying or dusting | |
| iii. Dipping | vii. Dosing | |
| iv. Hoof trimming | viii. Feeding | |

ACTIVITY

1. What are routine jobs?
2. Mention any three routine jobs in goat management.
3. What is castration?
4. Give any two methods of castration.

LESSON7 & 8

Castration

Castration is the removal of testes from a young male animal.

Methods of castration

- i. Closed castration (using a burdizzo castrator or elastrator)
- ii. Open castration. (Scaped operation) – The knife can be used to cut the scrotum / scalped used by veterinarians.

Advantages of castration.

- i. A castrated animal grows fatter and faster.
- ii. Castration prevents in-breeding.
- iii. Prevents the spread of venereal diseases (VD)
- iv. Helps to make the male animal calm (docile) and easy to handle (tame).
- v. Castration helps to improve on the quality of meat.

Disadvantages of castration

- i. Animals feel a lot of pain.
- ii. The wound may become septic.
- iii. The cut opens way to germs.
- iv. It is expensive to buy a burdizzo or hire a qualified person to carryout castration.

Dehorning

Dehorning is the removal of horn buds to prevent the growth of horns.

Disadvantages of disbudding

- i. Creates space on the farm.
- ii. Helps in identification of ones animals.
- iii. Prevents livestock animals from injuring others.
- a) **Hoof trimming:** Is the cutting off of over grown hooves. It is normally done in sheep. A trimming knife or hoof trimming shears are used.
Importance: To reduce the chances of infections and injuries.
- b) **Dipping:** Is the bathing of livestock in acaricides in a dip tank to kill ecto-parasites.
Importance: Helps to kill ecto-parasites e.g ticks.
- c) **Drenching:** Is the giving of liquid medicine to the livestock through the mouth.
Drenching is done using a drenching gun or bottle.
- d) **Spraying:** Is when a fumigator or knap sack sprayer is used to spray insecticides / pesticides to kill ecto parasites.

Importance: Prevents tick borne diseases like Red water, Heart water, etc.

- e) **Dusting:** Is the application of powdered medicine on the body of an animal to kill ecto-parasites.
- f) **Dosing:** Is the giving of solid medicine e.g Tablets using a dosing gun to kill endo-parasites like worms.
- g) **Feeding:** Is done using supplements, mineral licks, concentrates and fodder.

GRAZING GOATS

These are many methods of grazing animal, namely:

Define the scientific term browsing.

Browsing is the feeding on the soft parts of a plant by goats.

a) Rotational grazing

i) **Tethering**

ii) Strip grazing

iii) Paddock grazing

iv) Free range grazing (herding)

i) **Tethering:** Is when an animals is tied with a rope onto a peg to graze around.

Diagram of a tethering goat



Advantages of tethering

- i) Ensure efficient use of pasture.
- ii) Enables the growth of pasture in other areas.
- iii) Controls soil erosion as over grazing is avoided.
- iv) Controls spread of parasites and diseases.
- v) Allows pasture conservation.

Disadvantages tethering grazing

- i) Animals cannot get enough food (pasture).
- ii) It is tiresome to keep on changing the animals.
- iii) The rope can cause injuries to the animal.

2. **Free range grazing (herding)**

Is when the animals are left to roam and gaze freely?

disadvantages:

- i) Animals can easily get lost and stolen by thieves.
- ii) Animals can stray and spoil crops.
- iii) Animal diseases are easily spread.

3. **Zero grazing (stall feeding)**

Zero grazing system needs more attention than tethering.

This method is suitable for small scale farmers and in areas where most land is used for crop growing.

ACTIVITY

- 1. WHAT IS Grazing?
- 2. Mention any two methods of grazing goats.
- 3. Give the meaning of tethering grazing.
- 4. State one disadvantage of free range grazing.

The shelter for goats



LESSON 9

SHEEP REARING

TERMS USED IN SHEEP REARING

- a) Ram: a mature male sheep.
- b) Ewe: a mature female sheep.
- c) Lamb: a young one of a sheep.
- d) Lambing: Is the act of giving birth in sheep.

- e) Mutton: Is the meat of sheep.
- f) Shearing: Is the removal of over grown wool from the sheep.
- g) Docking: Cutting short of lamb's tail.
- h) Gestation period: Period of pregnancy in animals OR
Gestation period is a period between conception and birth.

Importance of docking sheep

To allow easy mating

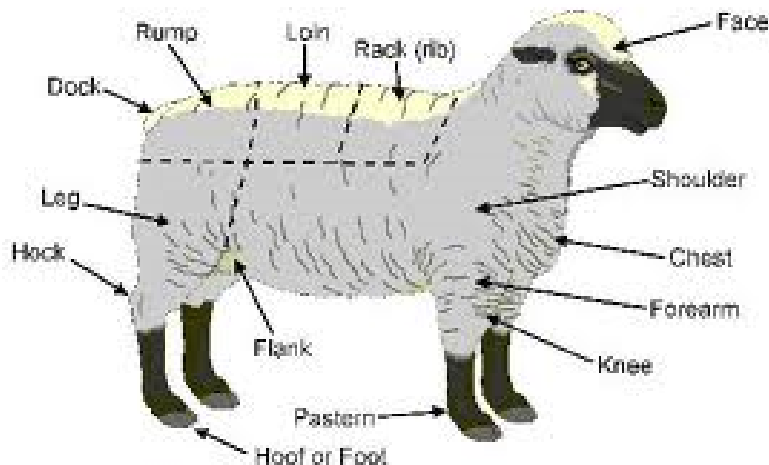
Why do farmers keep (rear) sheep

- i) For mutton production.
- ii) For wool (mohair) production mostly in cold climate areas.
- iii) For sale (income generation)
- iv)

3. A part from wool and mutton, give any other products got from sheep.

- i) The skin used to make feather, product like belts, bags, shoes, e.t.c
- ii) Horns and hooves used for making office glue, buttons or decorations.
 - For cultural purposes e.g sacrifice, rituals, pay dowry or bride wealth.

External parts of a sheep



GROUPS OF BREEDS OF SHEEP KEPT IN UGANDA

- 1. LOCAL BREEDS (indigenous)
 - i) East African breed / Blacks headed Persian.
 - ii) The Somali
 - iii) The Masai

ACTIVITY

- 1. EXPLAIN THE MEANING OF THE FOLLOWING TERMS
 - Lamb

- Mutton
 - Shearing
 - Docking
2. Give the importance of docking a female sheep.
 3. Why do farmers keep sheep?

LESSON 10

2. **EXOTIC BREEDS OF SHEEPS**

- i) Hampshire down sheep.
- ii) Dorper sheep.
- iii) Romney marsh
- iv) Corriedale
- v) Merino
- vi) Ramboulet

Mutton breeds of sheep.

All local breeds are reared for mutton e.g

- i) Black headed Persian.
- ii) The Somali
- iii) The masai e.t.c

Exotic meat breeds kept for mutton

- i) Hampshire
- ii) Dorper
- iii) Chirot
- iv) Sufflock
- v) Dorset

Dual purpose sheep

Dual purpose sheep are the sheep kept for production of mutton and wool e.g
Romney marsh / corriedate.

Wool breeds

- i) Marino sheep (fine wool)
- ii) Romney marsh (long wool)

BREEDING IN SHEEP

A ewe should be served at the age of 16 -18 months. (1 year 4 months – 1 year 6 months)

The gestation period of sheep is 5 months (150 days).

Weaning is done by giving.

Weaning is done by giving semi solid food to young ones besides milk from their mothers.

Weaning is done between 3 – 4 weeks.

Weaning sheep should be sheared at 8 months.

A mature sheep should be sheared once a year.

Identify the factors considered when choosing a good ewe / ram.

- i) Calmness / docile appearance / easy to handle.
- ii) The udder and teats should be well developed.
- iii) Should have good motherly and lambing ability.
- iv) Should be free from diseases.
- v) Should be free from hereditary effects.

ACTIVITY

- 1. Mention two examples of exotic breed of sheep.
- 2. Which exotic breed of sheep is well known for wool?
- 3. What is the gestation period of the sheep?
- 4. How do call a male sheep?
- 5. Mention any one sheep keep for meat.

LESSON 11

PIGGERY (KEEPING OF PIGS)

Piggery is the rearing and management of pigs.

TERMS USED IN PIGGERY

A SOW	Is a mature female pig
BOAR	A mature male pig
PIGLET	Is any young pig
GILT	Is a female young pig
STY	Housing structure for pigs
HOG	A castrated male pig
FARROWING	Is the act of giving birth in pigs
LITTER	Is group of pigs born at once
PORK	Fresh meat from pigs
BACON	Meat from the back and sides of pigs.
LARD	Fats from pork.
HAM	Dry processed meat of pigs.

Why farmers keep pigs

- a) Pigs are sources of income to farmers.
- b) To get pork and other products like lard.
- c) Sources of employment to farm workers.
- d) Pork, bacon, lard are source of proteins and fats to people.

ACTIVITY

1 Explain the following term in piggery.

- a sow
- a gilt.
- Sty.
- Farrowing.

- 2 Give two reasons why farmers keep pigs.
- 3 State any one characteristic of local breeds of pigs.

Other uses of pigs

Hair from pigs can be used to make bristles for tooth brushes and other brushes. cushions head wigs etc.

Hoooves from pigs can be burnt and used as ingredients in animal feeds.

Blood from pigs can be used as ingredients in animal feed.

Advantages of piggery

- a) Piggery is very profitable if managed well.
- b) Need little to begin.
- c) Requires a small piece of land to start the piggery farm.
- d) Creates employment to farmers and other people in the community.
- e) Profits can be realized in short period.
- f) Pigs are easy and cheap to manage as they feed on all types of food.

BREEDS OF PIGS

There are two groups of breeds of pigs kept in Uganda namely:

Local breeds(Indigenous breeds)

Exotic breeds(Foreign breeds)

LOCAL BREEDS

There are breeds that have been in Uganda for a very long.

Example of breeds of pigs:

Black pigs

Spotted pigs

CHARACTERISTICS OF LOCAL BREEDS OF PIGS

- Local breeds grow slowly
- Local breeds produce low quantities of pork
- They are small in size.
- They are easily attacked by disease.

WILD PIGS

There are pigs that live entirely in the bush.

Examples:

- Wart hogs
- Bush logs
- Hedge hogs.

CROSS – BREEDS (HYBRIDS)

- Cross-breeds (hybrids)

These are a result of mating two different pure breeds.

CHARACTERISTICS OF HYBRID

- Produce better quality products compared to local breeds.
- They are more resistant to diseases than the local breeds.

EXOTIC BREEDS

Are breeds that were imported from other countries.

Examples of exotic breeds.

- Large white
- Land race
- Polland China.
- Hampshire
- Saddle back/sessex.

CHARACTERISTICS OF EXOTIC BREEDS.

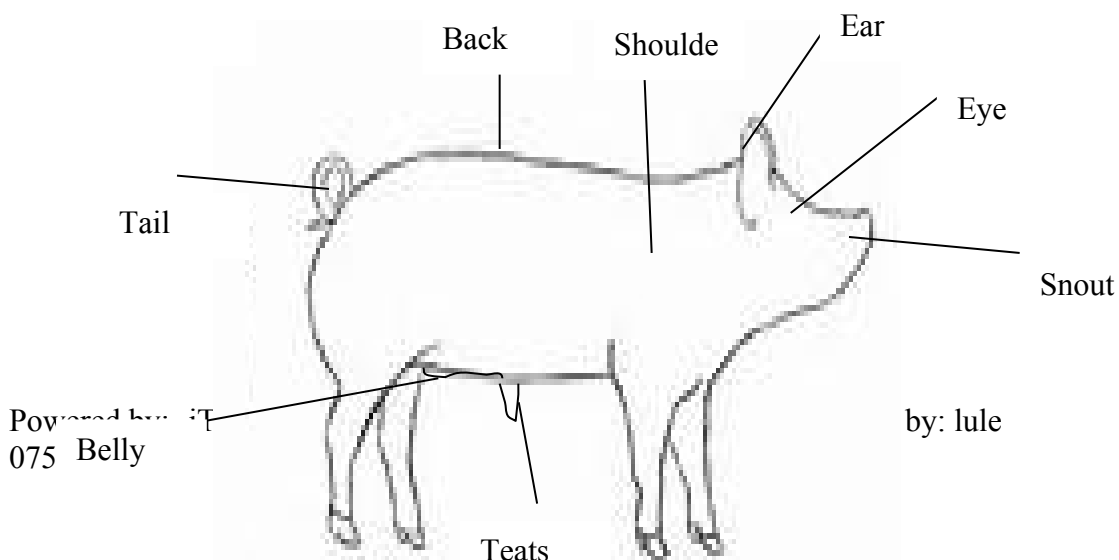
- Have the same ancestor
- Have the same ability to produce pork, bacon and ham.
- Have the same ability to grow fat and mature quickly.
- They mainly have the same colour.
- They have the ability to farrow the same number of litter.

ACTIVITY

1. What is piggery?
2. Cite the meaning the following terms
 - A sow
 - Gilt
 - Boar
 - Farrowing
3. Why do farmers keep pigs?
4. Mention one characteristic of local breed of pigs.
5. Give one example of exotic breed of pigs.
6. Suggest one reason for keeping exotic breed of pigs.

LESSON 12

EXTERNAL STRUCTURE OF A PIG.



ACTIVITY

1. Draw a pig and name the external parts

LESSON 13

ADVANTAGES OF KEEPING EXOTIC BREEDS OF PIGS.

- Produce high quality of pork and bacon.
- Mature fast and early.
- Can grow to a large size.

FACTORS CONSIDERED WHEN SELECTING A GOOD QUALITY PIG

- Heredity – The piglet should come from a good castral family.
- Good health – The piglet should show no signs of sickness/ poor health.
- Mammary glands – The piglet should have at least ten functional teats.
- Good body formation – The piglets should be well built in body structure.

SYSTEMS OF KEEPING PIGS

- Extensive system (out door system)
- Semi-intensive system.
- Intensive system.

EXTENSIVE SYSTEM

Is where the pigs are left to roam about looking for food.
Some times they are tethered.

Advantages of extensive system

- It is cheap to maintain.
- Pigs get to eat a variety of food.
- Extensive system requires less labour.

Disadvantages of extensive system

- Pigs are easily infected with diseases.
- The pigs can easily be stolen by thieves.
- Pigs can easily be killed by wild animals.
- Pigs can stray and destroy farmer's crops.

- The pigs can turn wild.
- Pigs can easily get worms and other parasites.

INTENSIVE SYSTEM

Is where pigs are permanently kept indoors (stys)

Advantages of the intensive system

- The pigs give high yields.
- Pigs are in most cases healthy (free from diseases)
- The death rate is low.
- Pigs receive maximum care and attention.
- It is easy to monitor individual pigs.
- Pigs grow and mature quickly.
- Pigs are not wild but rather friendly.

Disadvantages of intensive system

- It is expensive to manage.
- It is tire-some as it requires a lot of labour.
- Food and treatment are expensive.

ACTIVITY

1. Mention systems of rearing pigs.
2. Give the advantages of free range system.
3. Mention one disadvantage of free range system of keeping pigs.
4. Of what advantage is intensive system over extensive system?

LESSON 14

FACTORS CONSIDERED WHEN CHOOSING A GOOD SITE FOR A STY.

- Well drained land (area).
- Nearness to the water source.
- Cool environment.

CHARACTERISTICS OF A GOOD STY.

- Strong and well build to prevent the pigs from escaping.
- The floor should be slating to allow easy cleaning and flow of urine and faeces. Good drainage system inside and outside the sty to allow easy flow to wastes.
- Well ventilated to allow free circulation of air.
- Enough space for storage of feeds, water and farm equipments.
- Should have a farrowing pen for farrowing.
- Guard rails to prevent the sow from injuring the piglets while suckling.

SELECTION AND BREEDING OF PIGS

QUALITIES OF A GOOD BOAR.

- Vigorous and healthy
- Well developed straight fat and short legs.
- Free from hereditary defects.
- Calm and easy to handle.

QUALITIES OF GOOD GILT

- Efficient use of feeds.
- Healthy and vigorously built.
- Free from furrowing problems.
- Should have at least ten functional teats.

HEAT PERIOD

This is when a sow is ready to be mated.
A sow first comes on heat at 6 months.

Signs of a sow on heat

- Restlessness
- The sow mounts other animals.
- Stands still when mounted.
- The vulva swells and becomes reddish.
- Whitish discharge from the vulva.
- Loss of appetite.

GESTATION PERIOD OF A SOW

3 months, 3 weeks, and 3 days (112-225 days)

Steaming up

Steaming up is the feeding of female animals on special feeds to stimulate milk production.

When steaming should up be done in pigs.

At least 1½ months (45 days to farrowing)

Advantages of steaming up

- Increase in milk production.
- Prevents low birth weights.
- Enables the foetus to grow well.
- Builds up the animal's body to prepare for farrowing.

CARE FOR PREGNANT SOW

Feeds

Sow meal and weaner's meal are given to all breeding stock like boars, gilts, weaners, etc.

- A pregrant sow should be well fed to promoted the growth of the (fetuses)
- It should not mix with other pigs to minimize injuries.
- It should not be allowed to walk long distances since it is bulky (heavy).
- The sow meal contains fewer proteins than the creep feed.
- Creep feed has a higher protein content than any other feed.
- The creep feed is therefore used to feed piglets between 10 days-8 weeks) till they make 50 kg.
- Concentrates are also used as feeds in piggery.

Examples of feeds.

- Sow meals
- Bulky meal (food)
- Weaner's meal.

Diseases and parasites of pigs.

There are many diseases and parasites that attack a pig for example:

- a) African swine fever (hog cholera)
- b) Pneumonia
- c) Anthrax
- d) Nagana (trypano somiasis)
- e) Anaemia (piglet anaemia)
- f) Heart water
- g) Foot rot.

ACTIVITY

1. Identify two qualities of good gilt.
2. Give two characteristics of a good sty
3. What is heat period?
4. Give any sign of heat period in a sow.

LESSON 16

Among the parasites that attack pigs include Liver Flukes, Tape worms, Round worm and Ecto-parasites like ticks, red mites, depluming.

DISEASE	CAUSE	SIGNS	SYMPTOMS	CONTROL / PREVENTION
Swine fever (Hog cholera)	Virus	Bloody diarrhea Difficulty in breathing Sore eyes Dullness Less of appetite	High fever	Isolation of infected animals. Keep the house, water and equipment clean. Quarantine Kill, burn and burry infected animals. Vaccination at 6-7 weeks of age.

Pneumonia	Bacterial	Difficulty in breathing Coughing Discharge from the nose Loss of appetite		Treat with antibiotics Isolate the infected pigs.
Foot and mouth	Virus	Signs Sharp rising temperature Swelling of the moth and feet. Loss of appetite Limping Reduction in milk		Vaccination Applying Quarantine in the infected areas. Isolate the infected animals. Otherwise, there is no treatment.
Intestinal worms e.g. tape worms, round worms.		Swollen pot belly Loss of appetite		Regular deworming Drenching or closing the animals regularly. Keep the feeds clean.

KEEPING FARM RECORDS

Types of records kept on a piggery

- Litter records
- Farrowing records
- Feed records.
- Operation records.

Litter records: The litter records contain the number of piglets born together, piglet weaned in each round and the number of times a pig produces every year.

Farrowing records: Is where we record the date of mating, the expected date of farrowing or delivery and the actual date of farrowing.

Feed records: Is where we record the amount of feed given to the pigs daily.

Operation records. This includes the weaning date, and the dates weighing, vaccination and drenching.

Reasons for keeping records

- Records help the farmer to maintain the growth of the animals.
- They help the farmer to know the income and expenditure of the farm.
- They help the farmer to make decisions about the development of the farm plan.
- It helps the farmer to know whether he is operating at a loss or profit.
- Tell the history of the farm.
- Get loans.
- For fair taxation.

ACTIVITY

1. Identify any two diseases of pigs.

2. State two signs of swine fever in a pig
3. What are farm records?
4. Mention any three types of records kept in piggery.

LESSON 17

FOOD AND NUTRITION

Nutrition is the process of intake food and using it in the body for its proper growth.

Food is anything good eat or drink.

Why do people eat food:

There are many reasons why people eat and drink
Some reasons may be represented with 5 Hs namely:
Hunger, Habit, Happiness, Health and hospitality

BREAST FEEDING

Advantages of breast feeding to baby:

- Breast milk is a complete balanced diet for the new born baby
- It has some antibodies especially in the colostrums which helps to protect babies against some diseases. Colostrum is the first milk produced by the breast soon after delivery
- Breast milk is always clean and ready
- Breast milk is always at the right body temperature
- Breast milk is easily digested by babies

Advantages of breast feeding to mothers:

- Breast feeding can delay the next pregnancy
- Breast feeding is cheap to the family and mother in terms of expenditure
- Breast feeding is time saving, convenient and available whenever the baby needs it even at night.
- It improves the health of the mother as she has to eat in order to maintain breast feeding.
- Creates a love bond between the mother and the baby.

Disadvantages of breast feeding

- It spreads HIV/AIDS.
- It cannot be applicable to a mother of working class.
- The mother suffering from breast cancer cannot breast feed a baby.
- Milk contains synthetic nutrients which are not readily digested by a baby's digestive tract.
- It's time consuming.

ACTIVITY

1. What is nutrition?

2. What is food?
3. Why do people eat food?
4. Mention two advantages of breast feeding to baby and a mother
5. Suggest anyone disadvantage of feeding.

LESSON 18

BOTTLE FEEDING:

This is done by filling a bottle with boiled cow milk or powdered milk and then giving it to the baby to suckle

Advantages of bottle feeding

- It can be used when the mother dies.
- It controls the spread of HIV/AIDS.
- It can be used when the mother is at work.
- The baby can be fed in the absence of the mother.

Disadvantages of bottle feeding:

- It can easily be contaminated by houseflies
- Bottles are difficult to clean properly hence causing germs to grow and spread.
- Bottle milk can easily get contaminated causing sickness to the baby
- Powdered milk is time consuming and difficult to prepare.
- Cow's or tinned powdered milk is expensive to buy
- Some cow's milk or powdered milk may be diluted so much causing milk lacking a complete diet.

VULNERABLE GROUPS

These are groups of people who are easily harmed by not having enough different types of to eat.

OR

These are groups of people who need special care and attention.

Examples of vulnerable groups:

- Pregnant women and their un born children
- Breast feeding women and their breast fed children
- Weaning children
- Sick people
- Elderly people

People with special needs in the community

- Sick people
- The elderly
- Disabled
- Young people

Care for people with special needs

- Protection

- Medication
- Proper feeding
- Washing for them

ACTIVITY

1. Give one Advantage of bottle feeding.
2. State one disadvantage of bottle feeding to both the mother and the baby
3. What are condition may allow a mother to bottle feed her baby

LESSON 19

EACH VULNERABLE GROUP NEEDS A DIFFERENT TYPE OF DIET FROM OTHERS

1. Babies and children:

The special diet for babies and children includes;

Body building foods which contains proteins

Some of the foods which give us proteins are eggs, meat, milk, beans, fish and chicken

Proteins are needed in the making new body cells

New body cells are used for growth and repairing damaged body tissues and organs

Proteins are also needed to make enzymes and antibodies

Lack of proteins leads to sickness called kwashiorkor.

Kwashiorkor is a deficiency disease.

PROTECTIVE FOODS PROVIDE VITAMINS AND MINERALS

- Some sources of vitamin are liver, milk, fruit and vegetables.
- Vitamins and minerals help the body to resist diseases and boost body immunity
- A mineral like calcium is used in the growth of bones and teeth.
- Energy giving food are rich in carbohydrates:
- Some sources of carbohydrates are cassava, millet, maize and rice.
- If a child does not get enough carbohydrates he/she will develop a deficiency disease called marasmus
- **Carbohydrates** are needed in the body to generate energy
- **FATS:** These are used to produce energy to maintain body temperature and make the skin soft.

2. PREGNANT WOMEN AND THEIR UNBORN CHILDREN

Pregnant women need to eat food that will be enough for herself and for the unborn baby growing in her womb.

A pregnant woman needs a balanced diet containing the following

Proteins

To build the body tissues of the embryo growing inside her womb and also repair her worn out cells.

Carbohydrates

To give her enough energy to carry the foetus in her womb and also to do her jobs

Iron

To build hemoglobin in her own and in her unborn baby

Calcium

To build strong bones and teeth of the unborn baby inside her womb.

Vitamin

To protect her and unborn baby from catching infections

3. BREAST FEEDING WOMEN AND THEIR BREAST FED CHILDREN

- Breast milk is the only food required for a baby up to four months
- A breast feeding mother needs to eat foods and drink fluids that will help her body produce enough milk for her baby
- She needs extra foods from all food values but two important ones needed are;
- **Fluids**
- To stimulate the production of more milk in her breast such as clean boiled water, milk, fruit juices, bushera, porridge etc
- **Calcium**
- To replace the calcium in her body that the child is taking in the breast milk

4. Weaning children

This is the gradual introduction of semi solid foods to baby other than breast milk alone

It is better to start weaning the child at four months because of the following reasons;

1. The baby's body needs more nutrients because the body is growing
2. The baby needs to get iron from other foods because the iron it was born with is used up and the mother's breast milk does not contain iron
3. To prevent deficiency diseases like kwashiorkor and marasmus.

How to start weaning children:

- Start with semi-liquid foods like porridge in which milk is added
- Introduce one type of food at time until the baby gets used to it to avoid diarrhoea as the baby stomach is still weak to digest solid foods
- Continue feeding frequently using other weaning food like porridge, mashed matooke, mashed posho, mashed rice, mashed fruit or all the food can be mashed and given at the same time

- Remember children have small stomachs and need many meals a day.

5. SICK PEOPLE

These need good food and extra fluids in order to help the body fight sickness. Most of the foods include the following;

Proteins:

To repair the worn out cells during sickness

Vitamin and minerals salts:

The most important are vitamin C, Calcium and iron to build the body defence and also help in manufacture of blood.

Fluids:

To prevent dehydration

Such foods include clean boiled water, fruit juices, ribena, lucozade, tea, soup, from meat, fish soup.

Frequent feeding:

Sick people may not be able to eat very much at one time so they should be fed with easy food.

6. Elderly people:

When people grow old, they often lose their teeth which cause health problems, such that they do not crush their food for easy digestion which can cause indigestion or constipation.

So elderly people need the following food which is easy to eat such as minced meat, fish without bones, mashed fruits etc.

Frequent feeding because they may not be to eat very much at one time.

TRADITIONAL CUSTOMS AND FOOD TABOOS

These vary from community to another.

A custom is an established practice which is accepted in a community

Customs related to eating and drinking are usually based on religious or social beliefs.

Food taboos are traditional practices forbidding a community from preparation and eating some types of food.

These are many of these food taboos in different communities, below are some religious and cultural food taboos:

1. Muslims and seventh day Adventists are not allowed to eat pork by their religion.
2. Catholics are not supposed to eat meat on Fridays and during lent season
3. In the past women were not allowed to eat chicken and eggs among some tribes in Uganda.
4. In some tribes women are not supposed to eat mutton and goat meat
5. Among some tribes men are not allowed to eat lungs
6. In some tribes newly wedded couple are not supposed to touch a bone until the bride's father-in-law has killed a bull

7. One is not supposed to eat his totem for example members of the mamba clan in Buganda are not allowed to eat the lung-fish, which is their totem

Effects of food taboos in nutrition

- Other food taboos can result into serious nutrition deficiency diseases eg kwashiorkor, marasmus etc
- Children may lack certain food values in their body and become anaemic.
- Pregnant women may become malnourished and produce under weight babies.
- Alcoholic drinks, too, results in a family problem and can lead to malnourished children.

Advantages of traditional customs and food taboos:

- Taboos help to conserve some plants and animal, because they are held in high esteem as totems
- Food taboos help to shape our eating habits to suit the values and norms of our communities

Disadvantages of traditional and customs and food taboos:

1. They affect mainly women and children yet these groups are vulnerable and often need the food they are forbidden to eat.
2. Some food taboos are associated with food such as liver, chicken and eggs which are rich in proteins
3. Such taboos mean that children and women are denied some protein-rich foods sometimes leading to food deficiency diseases like kwashiorkor

For example:

- People in Buganda eat mostly bananas, cassava, coco yams and white yams
- People in Busoga eat sweat potatoes, cassava, millet, and some bananas
- People in Teso, Karamoja, Acholi, Lang, and West Nile eat mostly millet, mixed with cassava, cassava alone, sweat potatoes, sorghum mixed with cassava.

Therefore the feeding patterns of people depend on in which region these people are and the food mostly eaten is their staple food.

FOOD CONSUMPTION PATTERNS

People in different communities eat different food stuffs.

These food stuffs determine their staple food in that community.

Staple food is one's main food.

It is the basic food that is cheap and usually eaten mostly by every one in that community

ACTIVITY

1. What are vulnerable group of people?
2. Give examples of vulnerable group of people.
3. Identify any three people with special needs in the community.
4. How can a community care for people with special needs?

LESSON 20

Malnutrition and Deficiency diseases:

The common food deficiency diseases are kwashiorkor, marasmus, goiter, rickets, anaemia and beri beri.

The table below shows deficiency diseases, their symptoms causes and prevention

DISEASE	SYMPTOMS	CAUSE AND PREVENTION
<i>Kwashiorkor</i>	<ul style="list-style-type: none">• Peeling skin• Swollen face(moon faced)• Brown hair• Loss of weight• Wasted muscles• Pot belly	<ul style="list-style-type: none">• Lack of enough proteins in the diet• Feed on foods like meat, fish, eggs, milk which are rich in proteins
<i>Marasmus</i>	<ul style="list-style-type: none">• Constant hunger• Loss of weight• Children grow thin• A sunken stomach	<ul style="list-style-type: none">• Lack of enough carbohydrates in the diet• Feed on foods like maize, potatoes, cassava and yams
<i>Scurvy</i>	<ul style="list-style-type: none">• Bleeding gums• Pain in joints and muscles.	<ul style="list-style-type: none">• Lack of vitamin C in the diet• Feed on fruits and green vegetables
<i>Rickets</i>	<ul style="list-style-type: none">• Soft bones• Deformed and swollen legs• Brittle bones and teeth	<ul style="list-style-type: none">• Lack of enough vitamin D, Calcium and phosphorus• Feed on egg yolk and fish
<i>Beriberi</i>	<ul style="list-style-type: none">• Muscular weakness• Loss of nervous• Loss of control and paralysis• Slow growth	<ul style="list-style-type: none">• Lack of enough vitamin B1 in the diet• Feed on beans, egg yolk and meat
<i>Pellegra</i>	<ul style="list-style-type: none">• Skin disorders	<ul style="list-style-type: none">• Lack of vitamin B2 in the diet

	<ul style="list-style-type: none"> • Eye and mouth sores • General body weakness 	<ul style="list-style-type: none"> • Eat food rich in vitamin b2
Anaemia	<ul style="list-style-type: none"> • Severe tiredness • Pale skin 	<ul style="list-style-type: none"> • Lack of enough iron in the diet feed on green vegetables kidney egg and milk
Night blindness	<ul style="list-style-type: none"> • Poor vision at night • Dry skin 	<ul style="list-style-type: none"> • Lack of enough vitamin A in the diet • Feed on green vegetables, carrots, liver, egg yolk and milk.
Goitre	<ul style="list-style-type: none"> • Swollen neck 	<ul style="list-style-type: none"> • Lack of iodine • Feed on fish and table salt
Low ability of blood to clot	<ul style="list-style-type: none"> • Failure of blood to 	<ul style="list-style-type: none"> • Lack of enough vitamin K in the diet • Feed on green vegetable like cabbages and dodo.

Staple food

This is also called ones main food.

It is the basic food that is cheap and most often eaten by everyone.

Depending on which area you live in Uganda, this may be matooke, maize meal, millet, sorghum, and cassava of potatoes.

Food security

This is the keeping of enough food for future use.

Importance of food security

- Humans can be fed more efficiently on plant based diet as they require less water land and crops than meat based diet.
- They reduce the risk of conflict over the scarce water and grazing land.
- They prevent deficiency diseases that can spread in humans.
- They do not require human reliance on domestic animals for food when survival of animals can be uncertain e.g in times of drought.

ACTIVITY

1. What are food taboos?
2. Mention two effects of food taboo to the body.
3. What are deficiency diseases?

LESSON 21

PRIMARY HEALTH CARE (P.H.C)

Primary health care is the essential health care in which individuals, families and communities work together to solve their health problems.

Principles of P.H.C

NB Principles are basic rules followed while carrying P.H.C programme.

- i) P.H.C programmes must benefit every body (total health for all people)
- ii) People's needs must be dealt with according to priority. (starting with the most urgent)
- iii) All members of the community must be involved.
- iv) Many approaches must be used while carrying out P.H.C activities.
- v) Total health for all.

HEALTH

Health is the physical, emotional, intellectual wellbeing of an individual and not merely the absence of a disease.

ELEMENTS OF P.H.C

Elements of P.H.C are programmes that are meant to protect and maintain good health.

Examples of elements of P.H.C

- i) Accidents and first aid.
- ii) Immunisation
- iii) Family planning.
- iv) Water and sanitation
- v) Personal hygiene
- vi) Food hygiene and nutrition.
- vii) Oral and dental health care.
- viii) Maternal and child health care.
- ix) Community health education.
- x) Control of Communicable Diseases.
- xi) Public health, nursing and home visiting.
- xii) Collection of statistical data.
- xiii) Ante-natal and post natal care for mothers.
- xiv) CCD – Control of communicable diseases and CDD (control of Diarrheal Diseases)

Activities on PHC in promotion of community hygiene

- Rubbish burning.
- Proper disposal of faeces.
- Protecting water sources.

- construction of bore holes.
- Construction of pit latrines.

ACTIVITY

1. What is primary health care?
2. What are the principle of P.H.C?
3. Cite the meaning of the term health.

LESSON 22& 23

3. Community health education

- i) Keep the people informed on how to care for their own health e.g boiling water for drinking.
- ii) Food hygiene and nutrition:-
Enables people to know the importance of a balanced diet and the dangers caused by poor feeding.
- iii) Immunisation: Helps people to prevent immunisable diseases in the community.
- iv) Maternal and child health care.
Advises mothers and children about their health status and how to live healthy.
- v) Water and sanitation – helps communities to have clean and safe water for drinking e.g by digging wells/ boreholes for people in the community and protecting water sources.
- vi) Oral and dental health care:-
Is concerned with preventing dental problems like tooth decay and gum diseases among people in the community.
- vii) Family planning: teach people methods of birth control.
- viii) Accidents and first aid: teach and equip people with skills of giving first aid to casualties.

Responsibilities of individuals in P.H.C

Maintaining good personal hygiene through.

- Proper washing of the body and face at least twice a day.
- Brushing of teeth in the morning and after every a meal.
- Washing hands with soap before and after every meal and after using the latrine.
- Cutting short of fingers nails and toe nails.
- Washing clothes and beddings regularly.
- Washing the face and eyes every morning.

- Grooming hair.

Activities a family can do to promote P.H.C

- A family should avoid poor disposal of faeces and urine / proper use of latrines.
- Proper disposal of rubbish / house refuse.
- Boiling water for family members to drink.
- Cleaning breeding places for vectors near the home.
- Feeding family members on a balanced diet.
- Sharing information on health.
- Family members should avoid drug abuse.
- Practising good food hygiene.

Activities of a community in promoting P.H.C

- Protecting water sources to avoid water pollution / contamination.
- Digging a rubbish pit / distributing garbage container for proper disposal of rubbish.
- Growing and caring for crops to promote good nutrition.
- Constructing public latrines in public places like taxi parks, e.t.c for proper disposal of faeces and urine.
- Creating public awareness about immunization activities.
- Constructing rehabilitation centres for people with disabilities.
- Organising communal work to improve on sanitation.
- Organising public fumigation to kill vectors like mosquitoes, houseflies, tsetse flies,

e.t.c

SUITABLE LIFESTYLES AND HEALTH PRACTICES

All people should live in a way that reduces chances of catching diseases

e.g.

- Eating a balanced diet.
- Getting enough rest and sleep for body and brains to get refreshed.
- Maintain good body posture to avoid deformations.
- Avoiding drug abuse to minimize health problems like diseases.
- Washing and ironing clothes and bedding to kill germs.
- Doing physical exercise daily to refresh our bodies, burn excess fats, strengthen our body muscles, improve on the internal body organs, e.t.c.
- Visiting health workers early in case of any problem.
- Caring for other people with disabilities or health problems / complications.
- Reporting health problems like diseases out break early.

Good health practices in schools

- i) Health parades to promote personal hygiene in the school.
- ii) Having a school health committees to:
 - Organise fellow children to do communal work.
 - Encouraging parents to take their children for immunization.
 - Inviting health workers to have talks on health matters with children.
 - Promoting gardening to impart good farming methods in earners, promote good Nutrition and develop a positive attitude towards farming in learners among others.

Child to child programmes

Child to child programme is a programme where older children teach the younger ones good health habits.

They perform which help activities children learn how to work together and help each other on health matters.

Activities which are involved in child to child programme?

- Older children teaching young children how to maintain personal hygiene
e.g brushing teeth.
- Older children can play with young children.
- Helping the disabled children in washing their clothes, cooking food,
fetching water for them, etc.
- Teaching young children toilet habits.
- Caring for other children who are sick.

TOPICAL QUESTIONS

1. Write P.H.C in full.
2. What is Primary Health Care?
3. Give any one principal of primary health care.
4. Which element of P.H.C promotes prevention of the six killer diseases.
5. Which activities can primary five pupils do to promote P.H.C.
6. A part from the elements of P.H.C mentioned above give any other two elements of P.H.C.
7. How can people in the community promote good sanitation?
8. Identify any roles of a family in promoting P.H.C.
9. Give any one suitable lifestyle that can promote good health in an individual.
10. Give any two roles of a school health committee.
11. Why is it very necessary to have the following in a home?
 - i) a latrine
 - ii) A rubbish pit
12. Give any one activity of a health club in a school.