SCIENCE AND TECHNOLOGY

FOR

STANDARD 6

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STAGES OF A SCIENTIFIC INVESTIGATION

There are six stages of scientific investigation.
These are:

1. Knowing the problem
2. Making a prediction
3. Planning the investigation
4. Carrying out the investigation
5. Making meaning of the results
6. Making conclusions

These six stages can be summarized into three main stages which are:

- ✓ Planning stage
- ✓ Implementation stage
- ✓ Concluding stage

PLANNING STAGE
This stage involves a number of steps.

The first step is to identify the problem to be investigated.

The second step is to write the statement of the problem in the form of a question

The third step is to predict or guess the answer to the question or problem.

The predicted answer is called a hypothesis.

The next step is to identify what is going to be observed and measured.

These are the factors that would affect the results of the investigation which are called variables.

A variable is anything that can change.

The next step is to identify the materials that will be required to carry out the investigation.

The last step of the planning stage is to come up with steps to be followed in the process of collecting data.

The above steps of the planning stage of an investigation are summarised as follows:
Step 1 identifying the problems to be investigated

Step 2 writing a statement of the problem to be investigated in the form of a question

Step 3 predicting or guessing the answer to the question, that is, coming up with a hypothesis

Step 4 identifying the variables

Step 5 identifying the materials required for carrying out the investigation

Step 6 coming up with the procedures for carrying out the investigation

IMPLEMENTATION STAGE

The second stage of a scientific investigation involves implementing the plans that were developed during the planning stage.

This is the stage which the hypothesis are tested by carrying out the investigation.

During this stage, the variables to be investigated are deliberately changed while keeping the other variables constant.

The variables that are changed are observed and recorded as the investigation is being conducted.

The purpose of carrying out an investigation is to collect data through observation.

If one is not satisfied with the data that has been collected, it is necessary to repeat the procedures.

The data that is collected should be organised and presented in a meaningful way.

There are several ways of presenting data. These include tables and graphs.

When presenting data in the form of a graph, it is important to remember that:

* a sharp pencil should be used when drawing graph lines
* each graph should be given a title
* a scale that can give a large graph should be chosen so that points are plotted accurately
* the vertical and horizontal axes should be labelled and the units for each axis should be shown
* a line of best fit should be drawn if points do not lie on a straight line or smooth curve

When data has been collected, it should be organised in such a way that it is meaningful.

The procedures of organizing data are referred to as data analysis.

One way of analysing data is the use of graphs.

Once the data has been analysed, there is need to interpret it.

The interpretation of data involves determining the relationship between variables using the analysed data.

The methods of determining the relationships between variables include:

- Looking for patterns of data in a table
- Interpreting the shapes of graph lines

In summary, the implementation stage of scientific investigation involves the following:

Step 1 carrying out the investigation according to the plans.

Step 2 collecting data and presenting it in a meaningful way.

Step 3 analysing the collected data.

Step 4 interpreting the analysed data.

CONCLUDING STAGE

The last stage of a scientific investigation is the concluding stage.

During this stage, the hypothesis is evaluated against the interpretation of the data.

That is, the relationship between variables that has been determined from the data is compared with the hypothesis of the investigation.

If the determined relationship from the analysed data agrees with the hypothesis then the hypothesis becomes the conclusion of the investigation.

If the hypothesis is different from the relationship determined from the results of the investigation then the hypothesis is not true.

What is important is that the conclusion must be based on the results of the investigation and not on the investigator's wishes.

UNIT 2 THE HUMAN SKELETON

THE HUMAN SKELETON

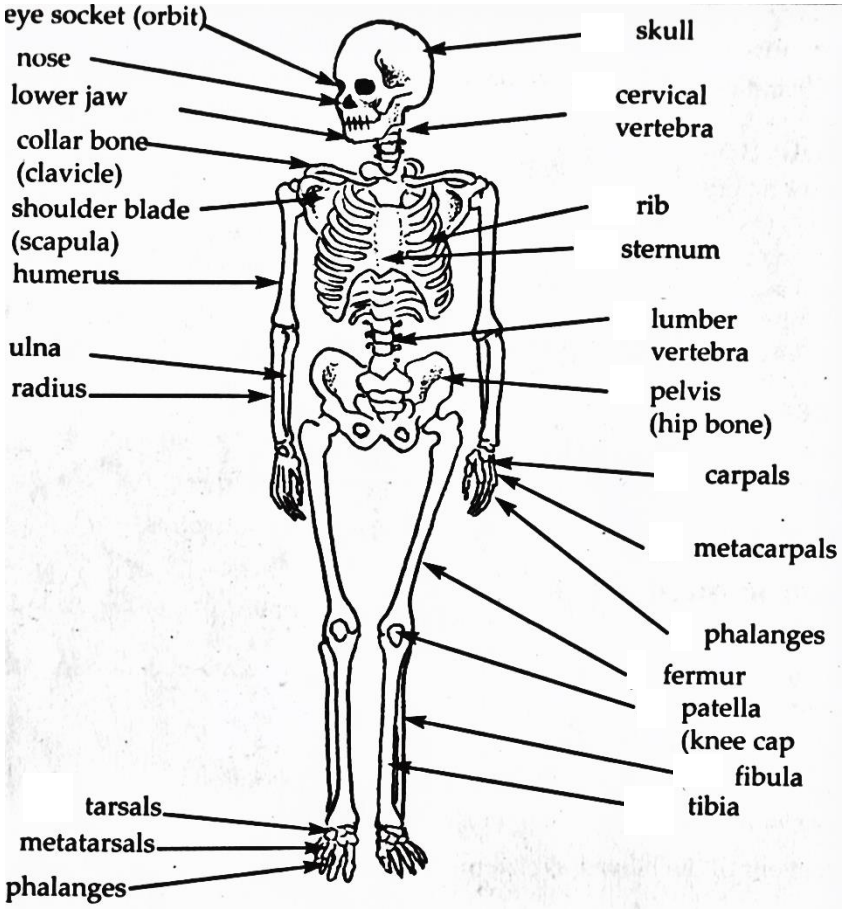
The skeleton is the hard part of the body.

It is composed of many bones which are joined together at places called joints.

FUNCTIONS OF THE SKELETON

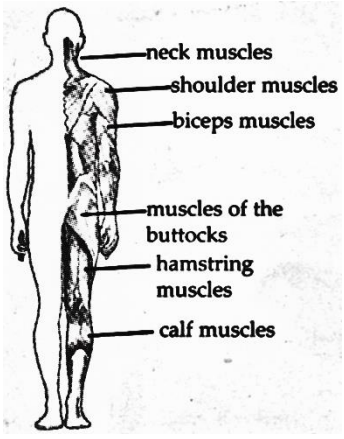
- Giving support to the body
- Protecting some delicate parts of the body such as heart, lungs, brain and the spinal cord
- Assisting in locomotion
- Giving shape to the body

A human skeleton

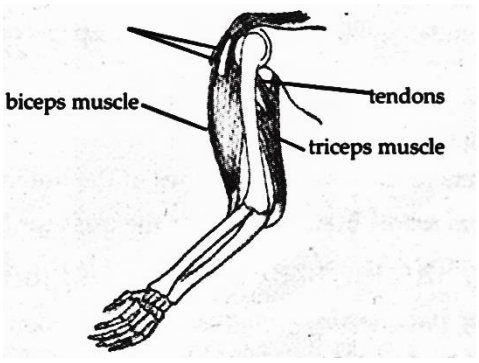


MUSCLES

Muscles are organs which are attached to bones by tissue called tendons



The main muscles of the body



How the muscles of the arm are attached to the bones

Muscles can contract and relax.

Their ability to contract and relax brings about movement at a joint.

When a muscle contracts, it pulls the bone to which it is attached and moves it in one direction.

JOINTS
Joints are formed when two or more bones meet

Examples of points include the skull, finger, shoulder, elbow, hip and wrist.

TYPES OF JOINTS

- Movable joints
- Immovable joints
- Hinge joints
- Ball and socket joints
- Gliding joints

Joints that allow movement are called movable joints. For example, finger, shoulder and elbow joints.

The joints that do not allow movement are called immovable joints. For example, the joints of the skull.

Joints that allow to and fro movement are called hinge joints. For example, the knee and elbow joints.

Those that allow rotational movement are called ball and socket joints. For example, shoulder and hip joints.

Joints at which bones move by sliding or gliding over another are called gliding joints. For example, joints of the neck.

UNIT 3 MOVEMENT IN HUMAN BEINGS

Muscles are attached to the bones by special tissue called tendons. The action of muscles allows movement at a joint.

For example, there are two muscles which control movement at the elbow joint.

When the biceps muscles contract, they pull the bones of the lower arm forward and the arm bends at the elbow joint. When the biceps muscles contract, the triceps muscles relax. When the biceps muscles relax, the

triceps muscles contract and pull the bones of the lower arm and stretch the arm. The contraction and relaxation of the biceps and the triceps muscles bend and stretch the arm.

Similarly, when the muscles at the back of the thigh contract, the lower leg is pulled backwards and the leg bends at the knee joints. When these muscles relax and the muscles in front of the thigh contract, the lower leg is pulled forward and the leg straightens.

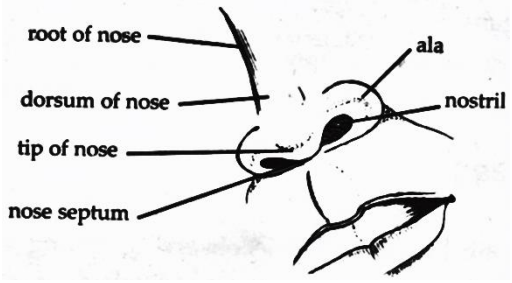
UNIT 4 SENSE ORGANS

SENSE ORGANS

The human body has five sense organs. These are the nose, tongue, ear, skin and eye. These organs have different functions. The nose is used for smelling; the ear for hearing; the eye for seeing; the tongue for tasting, and the skin for feeling and touching. Tasting, smelling, hearing, seeing, feeling and touching are called senses.

A. THE NOSE

The nose is used for smelling and breathing. It has nostrils through which air passes in and out of the body. The nostrils have hairs and mucus which trap some dust and germs, thereby, preventing it from getting into the body.



The structure of the nose

THE PROBLEMS OF THE NOSE

- Colds and flu
- Nose bleeding
- Sores
- Foreign bodies such as beans, maize and other seeds getting stuck and causing discomfort in the nose

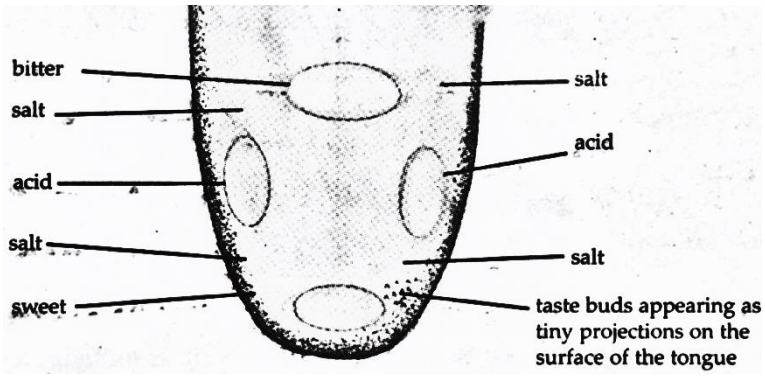
CARE FOR THE NOSE

Pushing or poking objects into the nose may damage it. If objects such as beans get into the nose, the victim should try to blow them out. If this fails, ask the victim to breathe through the mouth and take him or her to the hospital. The nose should also be cleaned regularly. Apart from this, avoid sniffing unknown substances.

B. THE TONGUE

The tongue is used for tasting things. It can detect sweet, salty, sour or bitter things. The tongue also helps during chewing and swallowing of food. It also helps in spitting, speaking and whistling.

The tongue has a rough surface. The bumpy structures on the tongue are called taste buds.



The structure of the tongue

THE PROBLEMS OF THE TONGUE

- sores
- foreign bodies such as fish bones
- swellings

CARE OF THE TONGUE

- avoiding eating foods that are too hot
- avoiding eating too fast
- avoiding talking while eating
- avoiding tasting unknown substances
- avoiding eating spicy foods

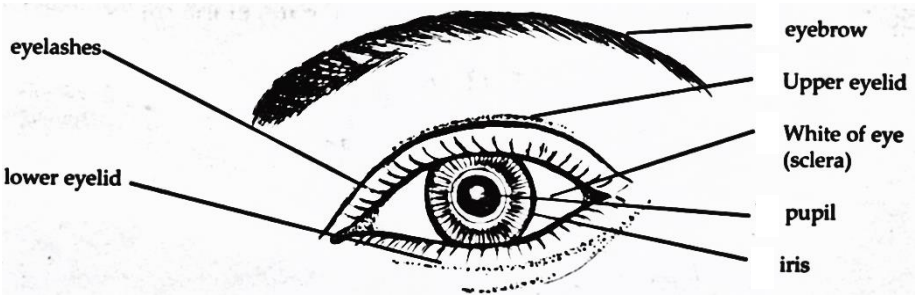
It is also important to brush the teeth and the tongue regularly to avoid bad breath.

C. THE EYE

The eye is an organ of sight. It has different parts for different functions.

The black spot of the eye is called the pupil. It allows light to get into the eye to see things. The coloured part of the eye is called the iris. This controls the size of the pupil. In dim light, the iris makes the pupil bigger to

allow more light to get in. In bright light, the iris makes the pupil smaller to reduce amount of light that gets into the eye. The eyelid and eyelashes protect the eye from dust and other particles.



The external parts of the eye

THE PROBLEM OF THE EYE

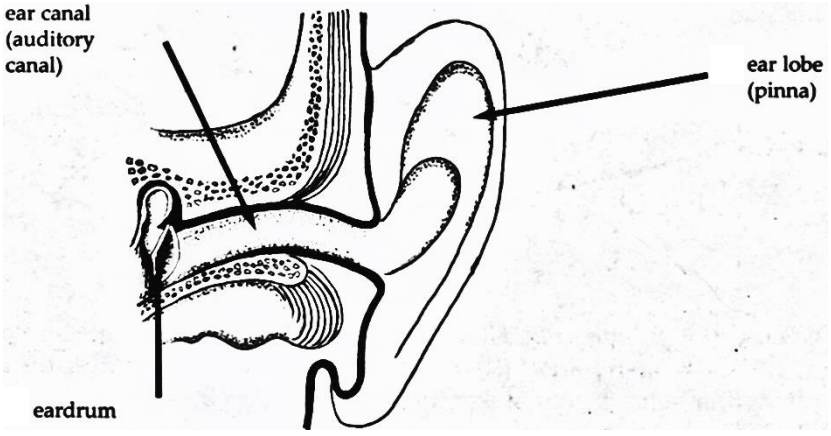
- Eye infections such as trachoma, conjunctivitis and sores
- Foreign bodies such as dust and insects getting into the eye causing pain
- Eye defects such as long sight and short sight

CARE FOR THE EYE

- Always keeping eyes clean and free from flies and dirt
- Eating foods which are rich in vitamin A such as green vegetables, pawpaws, carrots, butter and mangoes.
- Treating eye which has been infected
- Using a soft clean cloth when removing foreign bodies from the eyes
- Avoiding exposing the eyes to direct sunlight or any other bright light
- Wearing protective glasses when taking part in an activity that may cause injury to the eyes
- Not wearing glasses without proper prescription

D. THE EAR

The ear is an organ for hearing. The outer ear consists of the pinna and the ear canal or auditory canal.



The external parts of the ear

The pinna directs sound into the ear canal. At the end of the ear canal is a thin membrane called the eardrum. Sound causes the eardrum to vibrate. This helps us to hear sound.

The wall of the ear canal secretes brown wax which protects the ear passage. However, excessive wax may damage the ear drum or prevent a person from hearing.

THE PROBLEM OF THE EAR

- Damage of the ear drum
- Foreign bodies such as insects and seeds getting into the ear
- Ear infections

CARE FOR THE EAR

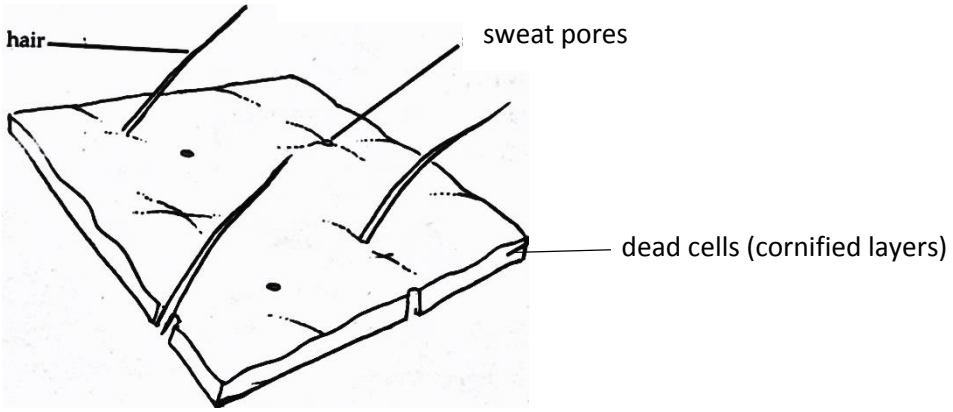
- Avoiding removing a foreign body from the ear with a pointed object that can damage the eardrum.
- Avoiding loud sounds
- using a wet cloth to clean the outer ear
- Avoiding using sharp objects to poke the ear

If the foreign body is an insect try:

- ✓ Directing some light into the ear so that it may come out
- ✓ Putting drops of either water, cooking oil, castor oil or glycerine. If these first aid measures fail, take the person to the hospital.

E. THE SKIN

The skin is an organ for feeling. It has different parts for different functions.



The external parts of a skin

FUNCTIONS OF THE SKIN

- Detecting roughness, softness, coldness and hotness of things. It also detects pain as a way of protection
- controlling body temperature. For example, when it is cold, the skin pores close and when it is hot, the skin pores open to release sweat and heat.
- Preventing germs from entering the body, for example, it acts as a barrier to the entry of germs into the body
- Acting as a shield against water, for example, when swimming or taking a bath

THE PROBLEMS OF THE SKIN

- skin infections such as rashes, scabies, ringworm and boils
- Cancer of the skin
- pimples/acne

CARE FOR THE SKIN

- Bathing regularly
- Avoiding using other people's bathing materials, like bath towers, face towels and sponges
- Protecting the skin against harsh weather conditions

UNIT 5 COMMON ACCIDENTS

Several accidents happen in the home and community. These include cuts, burns, scalds, nose bleeding, suffocation, choking, poisoning and road accidents. These can be caused by sharp objects, falls, fire, hot water and poisoning substances.

EFFECTS OF ACCIDENTS

- loss of blood
- disability
- blindness
- death

CAUSES AND PREVENTION MEASURES OF SOME COMMON ACCIDENTS

Accident	Causes	Prevention
cuts and grazes	• sharp instruments not properly used or handled • a falling object or a person falling down	• never leave sharp knives or pointed materials lying around • obstacles should be cleared from pathways • proper placing of items (shelving and hanging)
poisoning	• hazardous chemicals such as paraffin, diesel, acids, petrol, medicines and sap from trees, rotten or stale food.	• following prescribed direction when taking medicines • keeping medicines and other chemicals out of reach of children • not tasting, drinking or eating substances one is not sure of • avoiding eating rotten or stale food
burns and scalds	• dry heat, hot vapour and liquids	• keeping ourselves especially children away from fire, hot liquids and dangerous chemicals
choking	• food entering the wind pipe	• avoiding talking while eating • avoiding swallowing too much food at the same time • taking liquids slowly
suffocation	• poisonous gases • water • plastic bag put over the head	• keeping rooms well ventilated • avoiding playing in water • avoiding covering the head with plastic bags
drowning	• falling in deep water bodies such as rivers	• avoiding playing in water if one does not know how to swim • avoiding pushing each other into water • avoiding overloading canoes and boats

FIRST AID TREATMENT

First aid treatment is the first help given to an injured person before he or she is taken to the hospital.

First aid treatment is important because it can save life.

First aid treatment materials are kept in a first aid treatment box or kit

First aid treatment materials may consist of:

- cotton wool for cleaning wounds
- antiseptics for killing germs
- pairs of scissors and safety pins for cutting and doing up bandages
- various sizes of bandages
- plaster of different sizes
- tablets
- triangular and other types of bandages

PROCEDURES FOR CARRYING OUT FIRST AID FOR COMMON ACCIDENTS

Accidents	**First aid treatment**
cuts and grazes	• clean the cut or graze under running water – wash with clean, cool running water • touch lightly with antiseptics or salt • apply a dressing
nose bleeding	• bend the head forward • loosen any tight-fitting clothes on the victim • pinch the soft part of the nose for ten minutes • put a cold, wet cloth or ice on the bridge of the nose or forehead • if bleeding continues have the person bite a cob of maize or other similar objects between his or her teeth while leaning forward
sprain	• rest the part which is sprained • apply a cold pad or ice on the part which is injured • wrap with a triangular bandage
choking	• stand behind the person and wrap your arms around his or her waist • put your fist against his or her belly above the navel and below the ribs • press into his or her belly with sudden upward jerk
drowning	• remove any water and objects from the mouth as quickly as possible • lay the person on his or her back and lift the head backwards to open the air passages. • pull the tongue forward by gasping it between thumb and fingers • pinch his or her nose with one of your hands and rest the other hand on his or her chest • do a mouth-to-mouth breathing

The following additional information can help you to understand how to help a person who has nose bleeding or choked.

NOSE BLEEDING

To stop nose bleeding, follow the steps below:

- Sit quietly
- Pinch the nose firmly for 10 minutes or until the bleeding has stopped
- If this does not control the bleeding, pack the nostrils with cotton wool, leaving part of it outside the nose
- If possible, first wet the cotton with petroleum jelly, then pinch the nose firmly again. Hold it there for ten minutes or more.
- Leave the cotton in place for a few hours after the bleeding stops, then take it out gently.
- If a person's nose bleeds often, smear a little petroleum jelly inside the nostrils twice a day

If bleeding comes from the back part of the nose, it cannot be stopped by pinching.

In this case, have the person bite the cob of maize or other similar objects between her or his teeth while leaning forward.

The patient should sit quietly and try not to swallow anything until the bleeding stops. The cob of maize helps to keep the patient from swallowing. This gives blood a chance to clot. Eating oranges, tomatoes and other fruit may help strengthen the veins so that the nose bleeds less.

CHOKING

The following can be done to help the person who has choked:

- Stand behind the person and wrap your arms around his or her waist
- Put your fist against her or his belly above the navel and below the ribs
- Press into her or his belly with a sudden strong upward jerk. This forces the air from the lungs and should clear the throat. Repeat several times if necessary.

If the victim is much bigger than you, or unconscious do the following:

- Lay her or him on her or his back
- Sit over her or him
- Make a quick strong upward push
- Repeat several times if necessary
- If he or she still cannot breathe, try mouth -to -mouth breathing

To do mouth-to-mouth breathing follow the steps below:

- Open the mouth of the victim
- Remove any particles from the mouth
- Tilt the head of the victim to open the air passage to the lungs

- Pinch the nose of the victim with one of your hands while the other hand is placed just below the chest of the victim
- Breathe into the mouth of the victim while releasing the hand below the chest
- Press the hand below the chest of the victim as you breathe out
- Do this several times until the victim is able to breathe

UNIT 6 NUTRITIONAL DEFICIENCY DIESEASES

Nutritional deficiency diseases occur due to lack of a particular nutrient in the diet.

TYPES OF NUTRITIONAL DEFICIENCY DISEASES

A. Kwashiorkor

Kwashiorkor is caused by lack of proteins in the body.

It usually affects children below the age of five.

a child with kwashiorkor

FACTORS THAT MAY LEAD TO KWASHIORKOR

- Lack of protein in the diet during infancy
- Shortage of protein foods especially during weaning
- Lack of knowledge about food
- Infections to which children at this age are susceptible to, such as malaria, diarrhoea, measles, TB and intestinal worms

SIGNS AND SYMPTOMS OF KWASHIORKOR

- Loss of weight
- Poor appetite
- Swelling body due to accumulation of too much water (oedema)
- Failure to grow
- Large, protruding abdomen due to an enlarged liver
- Diarrhoea and vomiting
- Skin appearance changes and peels off
- Hair looks thin and straight
- Upper limbs get thin
- Mental retardation

B. Marasmus

Marasmus is caused by an overall deficiency of food in the body including protein and carbohydrates.

It occurs in children under the age of one.

a child with marasmus

CAUSES OF MARASMUS

- Low food supply
- Lack of knowledge of proper weaning practices
- Adhering to food taboos and beliefs
- Long illness or diarrhoea in a child may prevent absorption of food

SIGNS AND SYMPTOMS OF MARASMUS

- Poor appetite
- Not looking alert
- Little fat deposit under the skin
- Wasting of muscles or poor muscle development
- Loose or wrinkled skin

- Stunted growth
- Looking small for his or her age

PREVENTION AND TREATMENT OF KWASHIORKOR AND MARASMUS

Deficiency disease	**Preventive measures**	**Treatment**	**Suitable foods**
Kwashiorkor	• Provision of protein in the diet • De-worming children at three month intervals • Treating infections in good time	• Providing children with a balanced diet • Severe cases should be taken to hospital	• Meat, fish, eggs, soya beans, chickens, insects such as caterpillars, grasshoppers and flying ants
Marasmus	• Giving the child enough food • Quick treatment for any illness • Proper care from parents and guardians so that the child does not feel neglected • Education on proper weaning foods and infant feeding practices	• Providing children with a balanced diet • Severe cases should be hospitalised	• Body-building foods such as meat, fish, eggs, beans • Vegetables and fruits • Cereals such as maize, rice, sorghum and millet

UNIT 7 FOOD PRESERVATION

To preserve food means to treat it so that it is safe, does not decay or get spoiled.

Food preservation is an old practice for ensuring that people have food throughout the year.

This is important because food can be made available throughout the year.

CAUSES OF FOOD DECAY

Micro-organisms cause food decay and spoilage.

These micro-organisms are found in the air, water, soil and almost everywhere.

THE TYPES OF MICRO-ORGANISMS THAT CAUSE FOOD SPOILAGE OR DECAY

- Bacteria
- yeasts
- moulds

To preserve food successfully, the micro-organisms must be destroyed to stop them from growing and multiplying.

Once food is preserved, it should be stored safely, so that the micro-organisms are prevented from coming into contact with it.

THE IMPORTANCE OF FOOD PRESERVATION

- Reducing bulkiness for easy carrying and storage
- Avoiding wastage
- Adding variety to the diet because food can be eaten even when it is out of season
- Improving the flavour, colour and texture of food
- Keeping food longer for future use and in emergencies such as during famine, floods and war

FOOD PRESERVATION TECHNOLOGIES

There are several food preservation technologies.

These can be categorised into:

i. Indigenous food preservation technologies
ii. Modern food preservation technologies

INDIGENOUS FOOD PRESERVATION TECHNOLOGIES

These are technologies used to preserve food that have been developed within a given society.

These include:

a. Sun drying

The food is exposed to strong sunlight, which evaporates the moisture in it.

This creates unfavourable conditions for the growth and multiplication of micro-organisms.

The types of food which can be preserved in this way include fish, fruit, vegetables, beans and maize.

b. Smoking

Smoke is a preservative used to destroy micro-organisms and prevent their growth.

In this way, foods that are smoked are preserved.

Foods which can be smoked include fish and meat.

c. Salting

This is one of the oldest food preservation technologies.

In this technology, salt draws out water from the food.

The water from the micro-organisms is also removed by the salt.

This creates an environment that is not conducive for the growth of the micro-organisms.

Foods that can be salted and dried include meat, fish, caterpillars, mushrooms, fruit and green vegetables.

MODERN FOOD PRESERVATION TECHNOLOGIES

These are new technologies used to preserve food.

These include:

a. Freezing or refrigeration

This technology is used to preserve food by keeping it at low temperatures to inactivate micro-organisms.

When freezing, freezers, refrigerators and cold rooms are used.

Foods preserved in this way include meat, fish and vegetables.

b. Canning or bottling

This is one of the widely-used technologies of food preservation.

Both technologies rely on heating to destroy micro-organisms.

The bottles or cans are filled with food while air is removed.

Then the bottles or cans are immediately sealed, sterilised and cooled.

In most cases, preservatives are added to the canned foods to increase their life.

Canning or bottling is used to preserve foodstuffs such as fruit, fruit juices, milk, beans, fish, peas and meat.

c. Jam making

This is a technology used to preserve fruit.

It is based on the fact that a high concentration of sugar kills micro-organisms and prevents their growth.

After the jam is made it is sealed in jars cutting off air completely so that it remains fresh for a long time.

Jam can be made from fruit such as mangoes, peaches, guavas, plums, apples and strawberries.

STORAGE FACILITIES FOR PRESERVED FOODS

It is important to provide storage facilities for preserved foods in the homes.

The storage facilities include bottles or jars, baskets, cartons, freezers or refrigerators, granaries, sacks and food stores.

THE PROBLEMS OF FOOD PRESERVATION

- Loss of nutrients especially in the case of cooking
- Poor food hygiene. For example, the presence of sand in some vegetables, mushrooms and fish
- Expensive in terms of processing
- Lack of knowledge of food preservation
- Lack of continuous power supply
- Contributing to pollution and deforestation

UNIT 8 MATERIALS PRODUCTION

MATERIALS FOR PRODUCING THINGS

Different materials that people use in their everyday life are made through the use of scientific and technological processes.

Most of these materials are produced in factories using machines.

However, some of these materials such as soap, crayons, vim, floor polish and shoe polish can be made manually.

To produce these materials one requires materials and steps to be followed.

a) Crayon production

Crayons are formed by mixing melted candle wax and finely crushed coloured pieces of chalk or dye.

The wax is melted to allow the dye or crushed pieces of chalk to mix well. The mixture is left to cool down for it to solidify.

Resources needed

- candle wax
- finely crushed coloured chalk or dye
- 10cm pieces of pawpaw straws or reed
- metal containers, tins or pots
- sticks
- a source of heat

Process

a. heat pieces of candle wax in a pot or any metal container until it completely melts
b. add the coloured chalk powder to the melted candle wax
c. stir with a stick until it is well mixed
d. arrange pawpaw straw or reed upright in a container such as a plastic cup
e. carefully pour the contents into the straws in the container
f. let them cool down
g. peel off the straws
h. then the crayons are ready for use

b) Shoe polish making

Resources needed

- candle wax
- finely-crushed charcoal
- paraffin
- containers
- source of heat
- sticks
- pots
- mortar-and pestle
- sieve

Process

1. put the pot or tins with candle wax on fire
2. let the wax melt completely
3. add powdered charcoal to the wax
4. stir to mix well
5. immediately add a little amount of paraffin to the contents and keep on stirring until well mixed
6. you may pour the contents into storing containers of your choice such as used shoe polish cans
7. let the contents cool down
8. black shoe polish is ready for use

c) Floor polish making

Floor polish and shoe polish almost follow the same scientific process. Candle wax is melted and later mixed with a small amount of paraffin. The paraffin is added to the melted wax in order to let the wax be in a semi solid state as it cools down.

Resources needed

- candle wax
- pots
- paraffin
- sticks
- red oxide

Process

1. melt the candle wax in a pot or tin
2. add a little paraffin and stir until a desired thickness is acquired
3. you may add red oxide powder to obtain red floor polish
4. let the contents cool
5. the floor polish is ready for use

d) Production of cleaning powder

Scouring agents are used for cleaning different materials such as saucepans, cups, buckets, metal sinks.

These can be made locally.

Resources needed

- Egg shells
- Powder soap

- Mortars and pestles
- Sieves
- Containers

Process

1. grind the egg shells to very fine powder in a mortar
2. add a little powdered soap to the contents
3. mix well
4. the powder is ready for use

e) Soap making

Soap is made from animal fat or vegetable fat mixed with a strong alkali such as caustic soda, water and salt.

Fat is made up of fatty acids and glycerine.

Soap is formed by the chemical reaction of fat and caustic soda or caustic potash alkalis)

When alkalis are mixed with fat, glycerine is separated and the fatty acids plus the caustic soda form soap.

Resources needed

- fat
- beakers or tins
- water
- salt
- caustic soda
- sources of heat

Procedure

1. melt the fat in a beaker or tin for at least one hour
2. when the mixture is thick, add salt and boil it for 10 minutes
3. let the mixture cool
4. remove the layer of soap

UNIT 9 INFORMATIION AND COMMUNICATION TECHNOLOGIES

The term “information and communication technology” refers to the use of computers and other devices to capture, process, store, retrieve, transfer and control information in a variety of forms such as numbers, text, sound or images.

Examples of information and communication technologies are computers, telephones, cell phones, radios, televisions, fax machines and automatic teller machines (ATMs)

USES OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND HOW THEY WORK

The radio
The radio works by detecting waves created at a radio station.

The radio uses electronic systems to process the waves. In this way, people are able to hear music and voices through the receiver’s speakers.

The announcer speaks or plays music into a microphone. The sound passes through the microphone as sound waves. The transmitter picks these waves, then changes them to radio waves. The aerial of the radio receives the radio waves from the transmitter. The speaker of the radio then changes the radio waves into music or a voice.

The telephone
There are two types of systems that are used in transmitting messages through telephones.

These are analogue and digital systems.

In the analogue system, the telephones transmit voices over long distances electronically. In this system, the transmission can easily be distorted or be interfered with.

In a digital system, the spoken word is converted into a digital language before being transmitted. The receiver then converts the digital language to sound. There is no interference or distortion in this type of telephone system.

The fax machine
The fax machine is used to transmit information from a document (hard copy) using phone lines. When the document is being sent, first the information on the document is converted into a digital language. The receiver then converts the digital signal into the original language that is on the document. Thus, the printout of the document that comes out of the receiver is exactly the same as the original document.

The cell phone

The spoken voice is converted into a digital language which travels to receiver via a transmitter. The transmitter is used to amplify the digital language. The receiver then converts the digital signal into sound resembling the original voice.

The television (TV)

In the television studio, the cameras capture the pictures which are converted into a digital signal by an encoder. The digital signal travels to a satellite dish which sends the signal via a transmitter to a satellite in space. The satellite processes it and sends the signal back to the dish on the ground which then sends the signal to the television set. The decoder that is connected to the television set converts the signal into pictures and sounds that resemble the original ones. Signals from telephones and cell phones can also be sent by a satellite.

The computer

The computer can be used for collecting information which can be stored or analysed and made available for later use. The uses of the computer include managing accounts, keeping information on spare parts for cars in garages, keeping records of patients, collecting information on laboratory tests and helping diagnose diseases in hospitals, automatic flying of planes, forecasting weather, running the different activities and monitoring progress in factories, running radio and television programmes, sending messages quickly through electronic mail (e-mail) , playing games, and word processing, that is, typing and formatting the typed work.

A computer has three main parts:

1. input device
2. the central processing unit (CPU)
3. output device

The central processing unit is the main part of the computer.

The input devices of a computer are the keyboard and the mouse. The keyboard is used to enter information into the processor. The mouse is also an input device. It is moved around and controls an arrow that is known as a cursor which appears on the computer screen.

The monitor or screen is one of the output devices of a computer. It enables users to see what they are doing. The printer is another output device that produces a printed copy of the information in the computer.

The internet

This is another form of information and communication technology. The internet is a connection of millions of computers around the world. It uses a language that allows different computers in different parts of the

world to communicate with each other. The information on the internet is arranged on websites that can easily be accessed. People use the internet to store and find information quickly.

THE IMPORTANCE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

- source of employment in computer programming, website designing, computer maintenance and administration
- contributing to the improvement in the quality of health services
- can be used for leisure like computer games and movies
- enabling people to have quick access to information

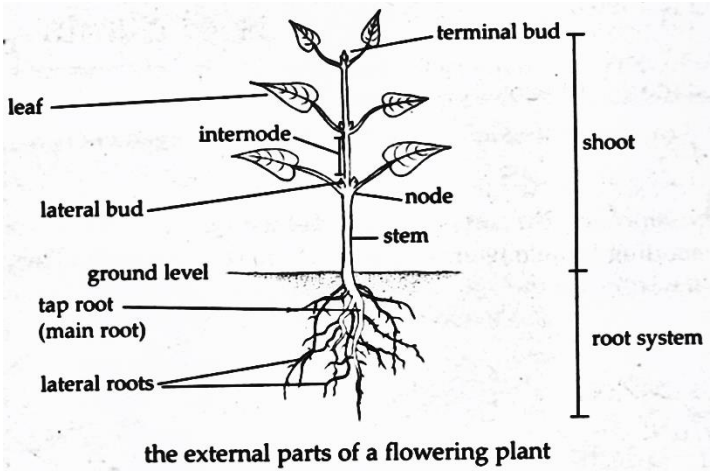
DISADVANTAGES OF INFROMATION AND COMMUNICATION TECHNOLOGIES

- increased unemployment rate in some sectors due to reduced demand for human labour
- exposure to health risks
- the high cost of advanced technologies

UNIT 10 THE EXTERNAL PARTS OF PLANTS

THE EXTERNAL PARTS OF A PLANT AND THEIR USES

A plant has different external parts.

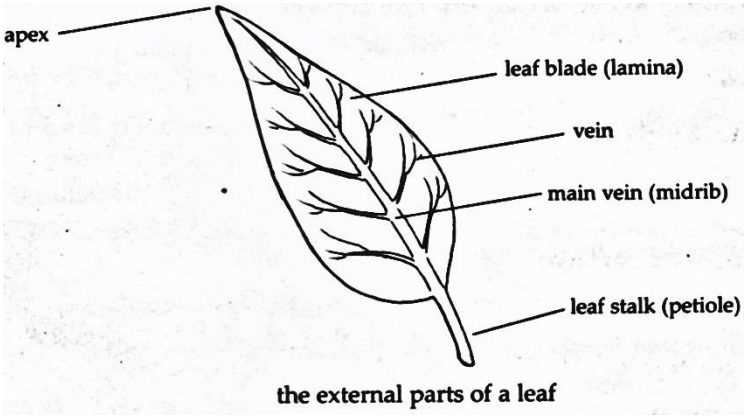


the external parts of a flowering plant

These parts have different functions

a) Leaves

These allow air to pass in and out of the plant through small openings called stomates. There are more stomates under the leaf than on top. Leaves also make plant food from water and carbon dioxide using sunlight in a process called photosynthesis.



the external parts of a leaf

Oxygen is also produced as a by-product of photosynthesis. The veins in the leaf carry water and mineral salts and make the leaf stiff.

b) Stems

These connect the leaves, branches and the roots.

Water and mineral salts from the roots pass through the stem to the leaves.

Some stems such as sugarcane and Irish potatoes store food for the plant.

c) Roots

The roots hold the plant in the soil. Roots take in water and mineral salts from the soil which is conducted to the leaves through the stem.

Some roots such as sweet potatoes and cassava store food for the plant while others do not.

d) Flowers

These are the reproductive parts of plants.

They produce fruit and seeds.

The colour and smell of some flowers attract some insects and birds.

These help to transfer pollen from the male part to the female part of the flower so that fertilisation of the male and female gametes can take place to form zygotes.

Zygotes develop into a seed.

UNIT 11 LIGHT ENERGY

SOURCES OF LIGHT ENERGY

Objects that give out light energy on their own are called direct sources of light.

These include the sun, fire, candle flames, fireflies, neon-worms and stars.

Objects that do not produce light energy on their own are called indirect sources.

These include the moon and reflectors.

The direct sources are classified into natural and artificial sources of light energy.

USES OF LIGHT ENERGY

- helping in seeing
- security: light helps to keep enemies away
- photosynthesis: green plants are able to make their own food because of light
- egg production: hens need enough day light length for egg making
- production of electricity: solar cells change light to electrical energy
- plant growth and flowering
- photography/video/filming: one is able to take pictures because of light
- production of Vitamin D in the body

HOW VARIOUS SOURCES PRODUCE LIGHT

The sun produces light because of gases that are burning all the time.

An electric bulb produces light because of the heating of tungsten wire. As electric current passes through the wire, it gets very hot and glows producing light.

These two examples show that light can be produced as a result of chemical reactions and the heating of electricity.

Another way of producing light is by friction or rubbing two things together. When one removes a nylon cloth from the body, it produces sparks of light.

Hitting two stones or metals together can also produce sparks of light.

Sparks of light are also produced during the use of grinding machines.

UNIT 12 HEAT ENERGY

SOURCES OF HEAT ENERGY

Food contains chemical energy which releases heat during respiration.

Fuels such as paraffin, wood, gas and charcoal also contain chemical energy which is released as heat when burning.

The burning of substances is, therefore, one of the sources of heat energy.

Also, rubbing hands together can produce heat energy.

Heat energy can, therefore, be produced by friction.

Electricity is another source of heat energy. As the electric current flows in a length of wire, it meets some resistance. The more electrical resistance to the flow of electric current, the greater the amount of heat energy produced.

USES OF HEAT ENERGY

- generating electricity
- providing warmth to people and animals
- cooling and heating water
- killing harmful insects and bacteria
- pressing clothes
- drying clothes and hair
- promoting germination of seeds
- fermentation
- smelting ores
- curing tobacco
- baking bricks
- firing of clay pots in kilns
- making of automatic switches to control the degree of hotness and coldness
- shrink fitting – done to have strong joints
- hatching eggs
- breaking rocks

NEGATIVE EFFECTS OF HEAT ENERGY

- Destruction of forests and infrastructure due to bushfires
- Loss of property as a result of fire
- Burns and scalds
- Making dwelling places uncomfortable

- Global warming which causes changes in climate resulting in either drought or heavy rains

UNIT 13 SOUND ENERGY

HOW SOUND IS PRODUCED

Sound is produced by a vibrating body or object.

Objects can be set into vibration by plucking, hitting, beating or blowing them.

The air in wind instruments is set into vibration by blowing.

Drums vibrate by hitting or beating them.

String instruments vibrate by plucking them.

For drums and string instruments to vibrate and produce sound, they must have a certain amount of tension.

The production of sound requires a vibrating source.

Musical instruments can be classified as wind, string and percussion instruments.

Examples of sources of sound are vocal cords, stretched pieces of string, reed, drums, insects, animals, cell phones, sirens, motor vehicles, radio and wind instruments.

USES OF SOUND

- For communication
- For entertainment
- For giving warning signals
- For telling time
- For mating in animals
- For determining the depth of water bodies or distance between two places
- For showing happiness
- For expressing sorrow

APPLICATION OF SOUND IN TECHNOLOGY

The technological application of sound include:

- Detecting heart beat
- Detecting minerals
- Detecting the presence of fish in a fishing ground

UNIT 14 METHODS OF COOKING FOOD

REASONS FOR COOKING FOOD

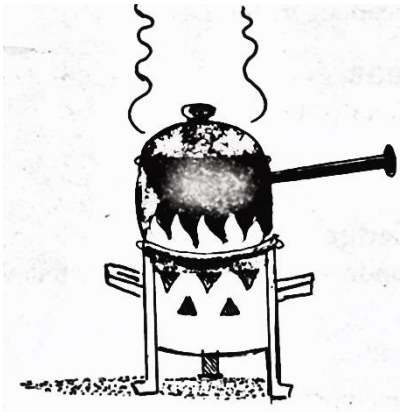
- Destroying harmful organisms which may be present in food
- Making food more digestible
- Making food taste good (palatable)
- Preserving food
- Improving the appearance (making it appetising)

METHODS OF COOKING FOOD

a) Boiling

This involves cooking food in boiling water until it is tender.

Suitable foods for boiling include meat, fish, starchy foods, green vegetables and root vegetables.



the boiling method of cooking food

THE ADVANTAGES OF BOILING FOOD

- It requires little attention
- The liquid in which foods have been cooked may be used for making soups, sauces and gravies
- It softens the fibres
- Several foods can be cooked together in one pot

THE DISADVANTAGES OF BOILING FOOD

- It uses a lot of fuel
- Some foods may lose flavour and colour
- Some vitamins can be lost
- Some mineral salts might be lost

COOKING FOOD USING THE BOILING METHOD GUIDELINES

- The water should just cover the food
- Use a saucepan with a strong base
- Have the water boiling before adding the food
- Pans should have close-fitting lids to reduce loss of steam

b) Steaming

This is cooking food in steam rising from boiling water.

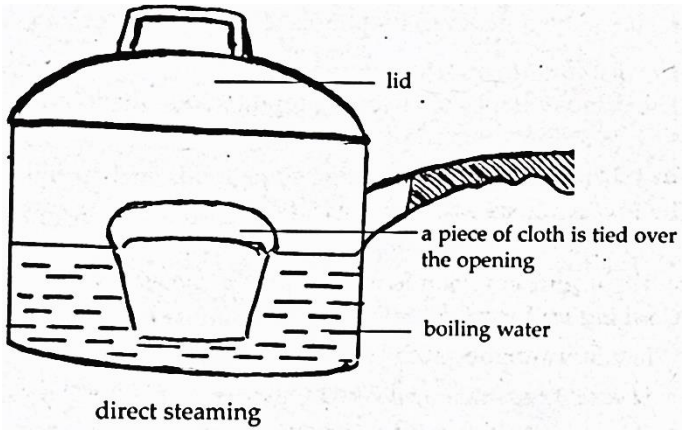
There are two ways of steaming food.

These are:

1. Direct steaming
2. Indirect steaming

DIRECT STEAMING

This is a type of steaming method where the steam gets into contact with the food.



direct steaming

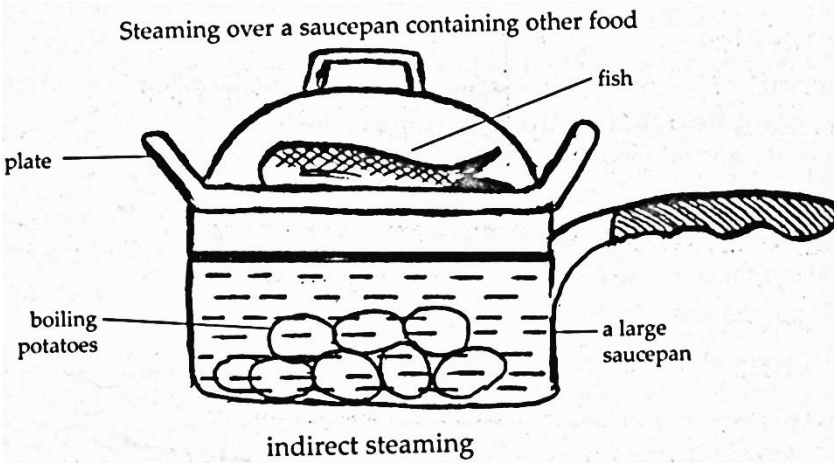
For example, when cooking mkate, the food is wrapped up in banana leaves and placed in a small amount of water.

INDIRECT STEAMING

This is a type of steaming where the steam does not get into contact with the food.

The food is placed in another container over a pot of boiling water.

Suitable foods for steaming include fresh fish, liver, root vegetables, pudding, egg and milk custard.



indirect steaming

THE ADVANTAGES OF STEAMING FOOD

- There is no loss of food value
- It requires less attention
- It is economical as three or four dishes can be cooked at the same time
- Food cooked in this way is easily digestible
- It can be done even by people who are weak or have a disability

DISADVANTAGES OF STEAMING FOOD

- It is slow method of cooking
- It is not suitable for cooking some foods such as tough meat
- It requires a lot of heat, therefore, more fuel consumption
- The food does not look appetising

COOKING USING THE STEAMING METHOD GUIDELINES

- The water should boil constantly
- Use a tight fitting lid on a saucepan to prevent steam from escaping
- Never allow the food to come in contact with water
- A supply of boiling water should be kept to replenish the water in the saucepan

UNIT 15 KITCHEN HYGIENE AND SAFETY

The kitchen is a place where food is stored, prepared and cooked.

THE IMPORTANCE OF KITCHEN HYGIENE

- Prevention of accidents such as falls, scalds, burns and poisoning
- Helps one to avoid excessive bending and stretching
- Prevents pests such as rats and cockroaches from breeding in the kitchen
- Prevention of diseases such as diarrhoea
- Avoiding food contamination

KITCHEN HYGIENE

Hygiene in the kitchen starts with people who work in the kitchen.

They should practice personal hygiene which involves:

- bathing every day and wearing clean clothes before beginning to work
- washing hands thoroughly after visiting the toilet
- avoiding handling food when you have an infectious disease such as flu
- keeping finger nails short
- wearing a clean apron or overall
- tying back hair or braids if they are long
- wearing a head scarf to prevent hair falling into food

The kitchen should be kept clean at all times.

This involves:

- keeping all working surfaces clean and in good condition
- emptying and washing kitchen bins regularly and keeping drains clean
- preventing pets from entering the kitchen
- not using dish clothes to wipe spills
- not using chipped crockery and utensils
- not leaving kitchen bins uncovered

Food should be handled hygienically.

The guidelines for food hygiene include:

- storing food covered and in dry, clean and cool places
- cooking perishable foods as soon as possible
- not leaving food uncovered
- not storing cooked food in the same container with raw food
- thawing frozen food completely before cooking it especially chicken meat

Daily cleaning of the kitchen

The daily cleaning of the kitchen should include:

- opening the windows
- washing all equipment and utensils
- putting everything in its correct place
- wiping sinks, window sills and other surfaces
- wiping stoves
- sweeping the floor
- mopping the floor
- washing all cloths, buckets and basins used for washing dishes

Weekly cleaning

In addition to daily cleaning, it is necessary to undertake thorough cleaning once a week which may involve:

- cleaning the cooking centre or stove thoroughly
- removing stains from walls and surfaces
- cleaning drawers and work surfaces with warm soapy water
- cleaning refrigerators thoroughly
- sweeping, washing, rinsing and drying the floor
- cleaning sinks and draining boards by using boiling water and washing soda

Occasional cleaning

Occasional cleaning of the kitchen involves all the other activities done daily and weekly, but also involves:

- sweeping and smearing the floor if it is made of mud
- sealing cracks on the wall
- removing cobwebs and soot
- cleaning windows
- washing curtains
- spraying or trapping and killing insects

SAFETY IN THE KITCHEN

The kitchen can be a cause of accidents if it is not properly cared for.

COMMON CAUSES OF ACCIDENTS IN THE KITCHEN

- poor repairs
- untidiness

- poor lighting
- carelessness in handling equipment
- sharp objects
- fire
- slippery floors
- poisonous substances such as paraffin and detergents

COMMON ACCIDENTS IN THE KITCHEN

- falls due to slippery or wet floors
- cuts caused by sharp objects
- taking poisonous substances
- suffocation caused by polythene bags
- burns
- scalds
- choking

SAFETY PRECAUTIONS IN THE KITCHEN

- immediately cleaning any spillage on the floor
- removing broken glass and sweeping the floor properly to remove splinters
- keeping sharp equipment properly out of children's reach
- turning saucepan handles inwards and out of reach of children
- switching off cookers after use
- cords for electric appliances such as pressing irons and electric kettles should be repaired and carefully insulated
- not having any curtains
- using proper oven gloves or cloth to lift hot dishes from the oven

UNIT 16 MEAL PLANNING AND PRESENTATION

A meal is a set of dishes served and eaten together at a specific time.

It can be served in the morning, in the afternoon and in the evening.

Meals should be nutritionally balanced and contain all food groups.

THE IMPORTANCE OF MEAL PLANNING

- saving money, time and energy
- avoiding monotony in the diet
- ensuring that one gets all the required nutrients in the right proportions
- avoiding wastage of food resources

FACTORS TO CONSIDER WHEN PLANNING MEALS

- the number of people
- the nature of work or occupation
- age
- health status
- the time of the day
- season of the year
- the occasion
- the nutritional value of each type of food

GUIDELINES FOR PLANNING MEALS

- plan meals for the whole day or week and not individual meals. This helps to avoid wastage
- choose suitable methods of cooking to avoid loss of food nutrients
- plan meals that are available if the food is to be bought
- avoid serving the same type of food every day to avoid monotony
- plan meals that have a variety in colour, texture, appearance and taste
- consider the different nutritional needs of the members of the family such as manual workers, sedentary workers, nursing mothers, children, the elderly and the sick

PLANNING SIMPLE NUTRITIOUS MEALS FOR THE FAMILY

There are three main meals in a day.

These are:

- breakfast which is eaten in the morning
- lunch which is eaten around mid-day
- supper or dinner which is eaten in the evenings

Meals should be planned carefully taking into account factors and guidelines for meal planning.

Examples of menus for different meals of the day

Breakfast	Lunch	Supper
Sample 1	**Sample 1**	**Sample 1**

Orange drink Rice porridge Tea with milk Boiled cassava	Stewed beef Boiled kholowa Nsima Fruit drink	Stewed beans Vegetable salad Steamed rice Mangoes
Sample 2 Pawpaw salad Mgaiwa porridge Thobwa Roasted sweet potatoes	**Sample 2** Curried eggs Stewed green beans Boiled potatoes Mixed fruit salad	**Sample 2** Stewed fish Boiled nkhwani Nsima Fruits in season

FACTORS TO CONSIDER WHEN SERVING MEALS

- the foods should be made of attractive colours
- dishes used for serving must be thoroughly cleaned
- the place where food is served should be clean and if possible should be decorated
- the amount of food to be served should be just enough for the number of people

UNIT 17 MACHINES

THE USES OF MACHINES

Machines help us to do work easily.

A machine amplifies force.

Some machines such as tongs and tweezers assist in holding hot objects

TYPES OF MACHINES

The following are examples of simple machines:

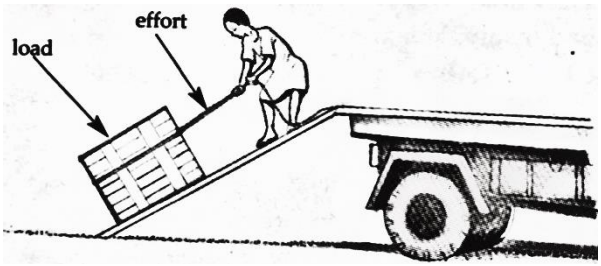
- inclined plane
- lever
- pulley
- wedge
- screw
- wheel and axle

a) Inclined plane

An inclined plane is a simple machine.

It consists of a plank or metal bar inclined to the earth's surface.

The load is pushed along the inclined plane onto a higher place.



inclined planes

The inclined plane allows a small force called effort to push a heavy load onto the body of a lorry.

An inclined plane provided a mechanical advantage (MA) which is worked out by dividing the load by the effort:

$$MA = \frac{\text{Load}}{\text{Effort}}$$

The load is the weight of the object and effort is the force exerted when moving the load up the inclined plane.

One can obtain a bigger mechanical advantage if longer, smoother surfaces and rollers are used.

b) Lever

A lever is a rigid body pivoted on an axis where it turns.

The point where a lever turns is called a fulcrum.

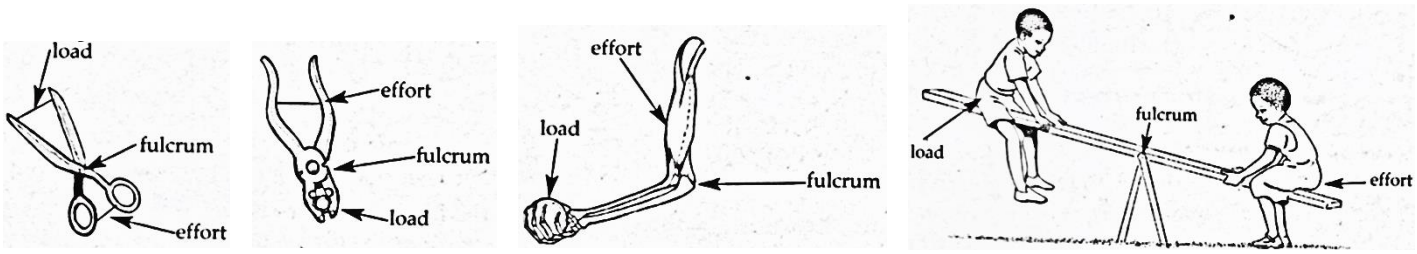
There are many examples of levers such as a bottle opener, a pair of pliers, crowbar, arm, scale, wheelbarrow and a pair of scissors.

CLASSES OF LEVERS

Levers fall into three classes based on the arrangement of effort, fulcrum and load.

1. Class one levers (first order levers)

In class one levers, the fulcrum is between the load and effort.



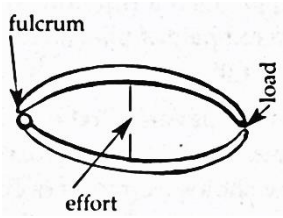
First-order levers

2. Class two levers (second order levers)

In class two levers, the load is between the effort and fulcrum.

3. Class three levers (third order levers)

In class three levers, the effort is between the load and the fulcrum.



pair of forceps

Examples of third-order levers are pair of forceps, fishing rod and tongs.

c) Pulleys

A pulley is defined as a wheel with a grooved rim in which ropes that lift loads pass through.

Each of the pulley system has wheels. Each wheel has a grooved rim.

The pulley system helps to change the direction of pulling.

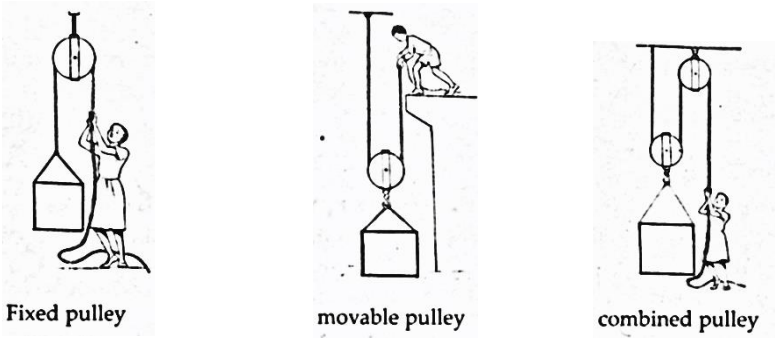
If there are more pulleys, one can even lift heavier loads.

TYPES OF PULLEYS

There are three types of pulleys.

These are:

- fixed pulleys
- movable pulleys
- combined pulleys



types of pulleys

For the fixed pulley, you have to use more effort than the load to be lifted. The advantage of this pulley is that you do not pull or push the pulley up and down and that your body assists in the lifting of the load.

A movable pulley moves with the load. The effort applied in this pulley system is less than the load to be lifted. This is the advantage of the pulley. The disadvantage of this pulley system is that one pulls or pushes the pulley up and down.

The combined pulley makes the effort smaller than the load. The effort is less than half of the weight to be lifted. The disadvantage is that the pulley has to move over a longer distance.

UNIT 18 CARE FOR ROOMS IN THE HOME AND ITS SURROUNDINGS

TYPES OF ROOMS IN A HOUSE

A home may comprise several rooms.

These include sitting room, dining room, bedroom, kitchen, bathroom and toilet.

In a traditional house, the kitchen, toilet and bath shelter are usually built outside the main house.

REASONS FOR CLEANING THE HOME

- promoting the physical and mental health of individuals living in the home
- providing comfort to the occupants of the home
- keeping the original appearance of surfaces in the home
- keeping the surfaces in the home attractive and in good condition

- keeping the home in good condition so that it lasts longer

WAYS OF CLEANING THE HOME

- sweeping
- brushing
- mopping

CARE FOR THE SITTING ROOM AND DINING ROOM

A) Sitting room or living room

This room is where family members meet to relax or entertain visitors.

It may also be used for reading, playing indoor games and listening to music.

The furniture for this room, therefore, should provide comfort and an atmosphere of relaxation.

CARE OF THE SITTING ROOM

Daily cleaning

- collect the necessary cleaning equipment and materials
- move light furniture and other objects to one side
- close windows and doors to avoid spreading dust while sweeping
- sweep the floor moving towards the door
- move furniture to the swept area and then sweep the remaining part and move dust together in one place
- collect dust and wrap it in old newspapers and burn it or throw it in a dustbin
- shake mats outside
- dust surfaces and objects.
- clean the floor according to its type. If it is plain concrete or varnished, mop with warm soapy water
- rearrange furniture, magazines or newspapers, if any
- open windows to let in fresh air
- clean and store cleaning materials and equipment

Weekly cleaning

- sweep and dust as in daily cleaning but start with removing cobwebs on the walls and floors
- shake cushions to remove dust and brush off dirt from upholstery furniture
- remove stains on the walls using the correct methods
- clean the floor according to its type
- clean windows thoroughly

- clean furniture and other objects according to their type
- brush and shake mats or rugs, if any
- rearrange furniture neatly.
- clean and store cleaning materials properly

Special cleaning

- carry out daily and weekly cleaning
- clean upholstered furniture and curtains thoroughly
- shampoo carpets, clean or wash mats according to their type
- finish and tidy up the room
- if the floor is made up of mud, smear the floor with mud or cow dung

B) Dining room

This room is usually smaller than the living room. It is used for serving meals.

The furniture for this room include the dining table and chairs, the cupboard or sideboard for keeping utensils and table linen.

Sometimes part of the living room or kitchen can be used as a dining room.

CARE FOR THE DINING ROOM

Daily cleaning

- collect the necessary cleaning equipment and materials
- move light furniture and other objects to one side
- close windows and doors to avoid spreading dust while sweeping
- sweep the floor moving towards the door
- move furniture to the swept area and then sweep the remaining part and move dust together in one place
- collect dust and wrap it in old newspapers and burn it or throw it in a dustbin
- brush and shake mats outside
- dust surfaces and objects.
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Weekly cleaning

- remove cobwebs from the walls and floors
- sweep and dust as in daily cleaning

- shake cushions to remove dust and brush off dirt from upholstery furniture
- remove stains on the walls using the correct methods
- clean the floor according to its type
- clean windows thoroughly
- clean furniture and other objects according to their type
- brush and shake mats or rugs, if any
- rearrange furniture neatly
- open windows to allow fresh air in the room
- clean and store cleaning materials properly

Special cleaning

- carry out daily and weekly cleaning
- clean upholstered furniture and curtains thoroughly
- shampoo carpets, clean or wash mats according to their type
- finish and tidy up the room
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CARE OF HOME SURROUNDINGS

Keeping home surroundings clean involves sweeping outside, cutting grass short around the home, removing cobwebs, picking up litter, draining stagnant water, disposing of refuse properly and planting flowers.

It is important to keep the surroundings clean to prevent the spread of diseases such as dysentery, cholera, diarrhoea, food poisoning and worm infections.

There are different types of refuse.

These are:

1. dry refuse
2. wet refuse

1) Dry refuse

This includes ashes, dust, dry leaves, waste paper, peels, broken glass, food waste and rugs

2) Wet refuse

This includes waste and from bathrooms, kitchen and sewage.

These should be disposed of in order to prevent the spread of diseases, avoid bad smell and make the surroundings look attractive.

METHODS OD DISPOSING REFUSE

Dry refuse
This should be collected in dustbins or in rubbish pits. When the bins are full, they can be collected and be emptied in landfills or rubbish pits. Once the rubbish pits are full, they should be covered with soil. Waste paper cab be collected and be recycled.

Wet refuse
This refuse should lead into a soak pit. Waste water from washing, bathrooms can be used for watering plants and flowers.

UNIT 19 LAUNDRY

Laundry refers to all the processes that are involved in making clothes and household linen clean.

These include washing, drying, pressing, airing and storing.

Different materials and equipment are used in all these processes.

LAUNDRY MATERIALS
These are sometimes called laundry agents.

They include the following:

- water
- soap
- bleaches
- starches
- stain removers

Water
It is one of the most important laundry agents.

Clean and soft water is ideal for laundry work.

Soap
This is used with water to remove dirt

Bleaches
A bleach is a substance used on white articles to brighten them.

Bleaches are used only on cotton and linen fabrics.

They help to remove stains.

Bleaching can be done naturally or by using chemicals.

Drying white clothes in the open air where there is bright sunlight bleaches clothes naturally.

Starches
This is a laundering material to stiffen and give a smooth finish to garments and articles.

When garments and articles are starched they are easy to iron. Starch can be bought in powdered, liquid and spray forms.

Stain removers
Stains are unwanted discolorations on a garment or article.

Stains should be removed as soon as they occur.

Some can be removed by using water and soap while others can be removed using stain removers.

LAUNDRY EQUIPMENT
Laundry equipment may be large or small.

This equipment includes laundry sink, bathtub, basins, pegs, clothes, line, pressing iron, pressing board or table, pails, stand, hangers, pressing sheets and pressing blankets.

When not in use, the equipment should be washed, dried and kept in a cool dry place.

STEPS IN LAUNDERING

The main processes in laundering are as follows:
- sorting
- mending

- soaking
- washing
- drying
- pressing
- airing
- storing

THE IMPORTANCE OF LAUNDERING GARMENTS AND ARTICLES

- making garments and articles last long
- making garments and articles look clean and attractive
- preventing bad smells, lice and breeding of germs which cause the spread of diseases such as skin diseases
- promoting good health
- promoting one's image

TABLE LINEN

Table linen is part of household articles used to decorate the home.

These include doilies, chair backs, table cloths, place mats, serviettes and tray cloths.

The articles need to be clean and attractive.

This is because families use them when entertaining visitors or serving meals.

USES OF TABLE LINEN

- it protects furniture from dust, hot temperatures and spills from food
- it is used for decoration
- it can be used for covering food
- it reduces noise from plates and crockery

LAUNDERING TABLE LINEN

Procedures

- sort according to colour and degree of dirt
- soak in cold water to soften the dirt
- wash in hot soapy water using the friction method
- rinse in hot water first, then in cold water
- use starch if required
- dry in the sun

- dampen the linen before pressing, if necessary
- air outside
- fold and store

UNIT 20 STATES OF MATTER

SOLIDS, LIQUIDS AND GASES

Matter can be classified into solids, liquids and gases.

1) SOLIDS

Solids have definite shape and size.

Examples include stones, rubber, wood, flour, bricks and cups.

2) LIQUIDS

Liquids flow, can be poured, take the shape of their container and have definite volume.

Examples include water, blood, petrol, cooking oil, paraffin and milk.

3) GASES

Gases flow in all directions, are easily compressed and fill the container in which they are placed and they do not have a definite shape or size.

Examples include oxygen, carbon dioxide and vapour.

USES OF MATTER

- building blocks of structures such as bricks, stones and wire
- as a means of transporting nutrients in living things
- keeping the shape and size of things (turgidity)
- a home of animals
- they are sources of energy for example paraffin and ethane

CHANGES OF STATES OF MATTER

Matter can change its state depending on temperature.

Generally, when solids are heated they change into liquids. This is called melting.

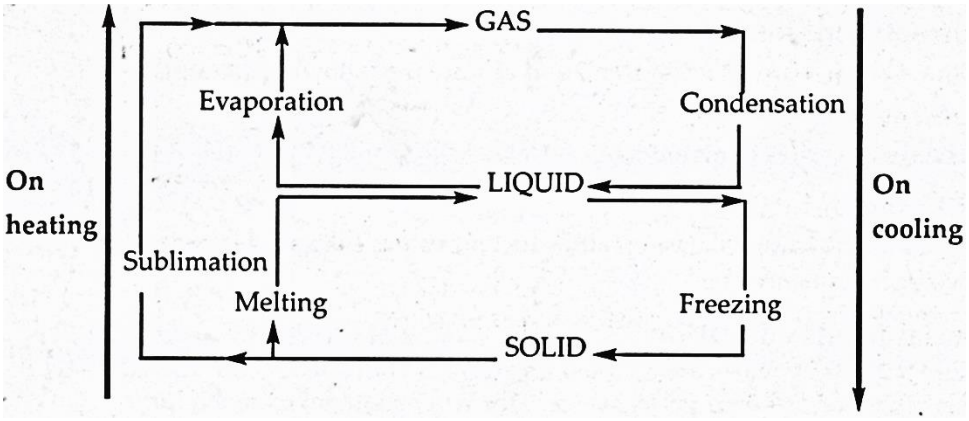
When liquids are heated they change into gas. This is called evaporation.

When gases are cooled they change into liquid. This is called condensation.

Liquids change into solid when cooled. This is called freezing or solidification.

Some solids change from solid state to gaseous state. This process is called sublimation.

Iodine can sublimate.



changes of states of matter

APPLICATION OF CHANGES OF STATES OF MATTER

Changes of states of matter can be applied in many ways in everyday life.

These include:

- drying clothes
- making ice blocks
- preparation of jelly
- distillation of alcohol

UNIT 21 PACKED MEALS

School children grow fast and are very active.

They, therefore, have a great need for protein, calcium, vitamins, carbohydrates and other nutrients necessary for the body to grow properly.

Therefore, they need to carry nutritious packed meals from home to school.

A packed meal is taken during break time to provide energy and refreshment.

Parents and guardians should be discouraged from giving money to school children because they may not buy food, or if they do, it may not be the right kind of food.

REASONS FOR TAKING PACKED MEALS TO SCHOOL

- ensures that one has a daily supply of food
- discourages them from stealing from one another
- ensures that they carry clean, safe and nutritious food

FACTORS TO CONSIDER WHEN PLANNING PACKED MEALES

- the nature of food
- the method of cooking
- the nutritive value
- nature of work
- drinks

SUITABLE FOODS FOR PACKED MEALS

- mkate
- fritters
- roasted maize
- roasted groundnuts
- bananas
- oranges
- bean cakes
- boiled cassava
- green maize
- potatoes
- boiled eggs
- fruit juices

SUITABLE MATERIALS FOR CARRYING PACKED MEALS

- plastic paper
- banana leaves
- plastic bottles
- vacuum flasks

- plastic food containers
- aluminium foils

UNIT 22 IMPROVING THE HOME AND ITS SURROUNDINGS

A house can have several rooms.

These include a sitting room, dining room, bedrooms, kitchen, toilet and bathroom.

Each of these rooms has a specific function.

WAYS OF IMPROVING VARIOUS ROOMS IN THE HOME

a) Sitting room

A good sitting room should have facilities for relaxation and entertainment.

These include furniture such as sofa sets or mats.

To make the sitting room cheerful and pleasant:

- clean the room regularly
- ensure it is well ventilated
- improvise furniture
- arrange equipment and furniture attractively
- decorate the room by using items such as mats, floor rugs,, carpets, ornamental plants, pictures and photographs, wooden carvings and paintings
- picture frames should be mended
- damaged pictures should be replaced

b) Dining room

A good dining room should have dining chairs, a table, a cupboard or sideboard for storing utensils.

This room is usually smaller than a sitting room.

It is used mainly for taking meals.

Sometimes part of the living room or kitchen area is used as a dining room.

The dining room can be improved by:

- cleaning it regularly
- improvising furniture
- arranging equipment and furniture properly
- decorating it with items such as floor rugs, ornamental plants, pictures and wood carvings.

c) Bedroom

A good bedroom should have facilities for sleeping.

These include beds, mattresses, mats, pillows, sheets and blankets.

A bedside locker or small table is also useful for keeping a bedside lamp or candle.

A bedroom should always smell fresh, look attractive and comfortable.

Therefore, it needs plenty of light and ventilation.

Light helps to keep insects and pests away.

Big windows provide good ventilation.

The bedroom can be improved by:

- cleaning it regularly
- improvising furniture
- arranging equipment and furniture properly
- decorating it with items such as floor rugs, pictures, carpets, lamp shades, bed covers and colourful curtains

d) The bathrooms or toilets

In a house with running water, a toilet may be within the house.

These should be cleaned with disinfectants frequently.

In addition, the two rooms can be improved by making sure that things are arranged properly, decorating the room with floor rugs, toilet sets and shower curtains.

Windows should be big enough for ventilation.

Bath shelters should be well constructed and have a soak pit for proper draining of water.

PLANTING FLOWERS AROUND THE HOUSE

In order to improve the appearance of the surroundings, it is important to plant flowers around the house.

Flowers, shrubs or ornamental plants add beauty to the surroundings.

Also, well tendered flower gardens can create a beautiful environment ideal for reading, painting, composing music and writing.

This can give members of the family an opportunity to grow and discover their potentials.

RENOVATION OF THE HOME

Apart from improving the various rooms in the house, existing items can be mended or renovated.

Hence, new household articles can be made out of available materials.

Items such as table cloths, curtains and bed sheets can be darned, patched and hems repaired.

Wooden articles can be re-varnished.

String is cheap and easy to obtain.

With a little skill it can be made into many different things that can decorate different rooms in the home.

FLOWER ARRANGEMENTS

The house can also be improved by the use of flowers arranged variously.

When using flowers to improve the home consider the following factors:

- the type of occasion
- the colour scheme
- the size of the table
- the shape of the table

PROCEDURES FOR FLOWER ARRANGEMENT

- fit flower supports into the base of a vase. Fill the vase with water
- cut the ends of flower stems evenly to allow easy water uptake
- arrange leaves, ferns or grass to the desired shape
- position flowers according to their size and colour
- look at the arrangement from all directions and add extra leaves or flowers where necessary
- dry the outside of the vase and place it where required. Check the appearance of the arrangement and make necessary alterations

UNIT 23 MANAGING INFORMATION AND COMMUNICATION TECHNOLOGIES

Communication is the process of sending and receiving information.

People communicate in different ways.

WAYS OF COMMUNICATING

- verbal communication
- non-verbal communication

Communication can take place verbally by means of talking or singing. This is called verbal communication.

Communication can also take place non-verbally by means of body language and facial expression. This is called non-verbal communication.

With the advancement of technology, different forms of communication have been developed.

These include books, letters, newspapers, magazines, newsletters, television, radio, films or videos, fax, telephone, cell phone, e-mail and internet.

PROBLEMS AFFECTING INFORMATION AND COMMUNICATION

- lack of appropriate information and communication technology
- inability to access and use the available information and communication technology
- high cost of information and communication technology
- vandalism of public information and communication facilities.
- Low levels of literacy which makes it difficult for some people to access certain information
- Poverty which makes it difficult to afford the high cost of information and communication technology
- Poor information and communication services
- Lack of opportunities for training in information and communication

SUGGESTED SOLUTIONS TO PROBLEMS OF INFORMATION AND COMMUNICATION

- Communication should be provided with appropriate information and communication technology
- People should be informed about how to access and use available information and communication technology
- Information and communication technologies should be sold at reasonable prices
- The general public should be sensitised on the importance of public information and communication technologies to minimise vandalism
- The literacy levels among the people should be raised

- Levels of poverty should be reduced
- Information and communication services should be improved
- Personnel working in information and communication including the users should be properly trained

WAYS OF MANAGING INFORMATION AND COMMUNICATION TECHNOLOGIES

a) Computers

Computers should be:

- handled by properly-trained persons
- covered after use to avoid dust
- repaired by a qualified person if they have developed a fault
- kept and used in a relatively cool environment
- updated regularly

b) Radio

Radios should be:

- handled with care
- given to a qualified person for repairs
- connected to a suitable power supply
- put far from any object that interferes reception

c) Cell phone

Cell phone should:

- not be dropped to the ground
- not be in contact with water
- not be used for too long at any particular time
- not be kept or stored in a hot environment
- not be overloaded with information
- be taken to a qualified person for repairs
- be fitted with the right type of battery
- be charged whenever the battery is low
- be switched off in unauthorised places such as banks, planes, fuel stations and places of meetings

d) Telephone

Telephone handsets should:

- not be dropped
- be repaired by a qualified person
- not be used for too long to minimise telephone bills

e) Fax machine

Fax machine should:

- always remain connected and switched on
- have enough paper for receiving documents
- always have enough toner
- be repaired by a qualified person

f) Television set

Television sets should be:

- connected to the power supply
- handled with care
- repaired by a qualified person
- switched off during lightning
- only operated by a person who knows how to do it

DESIGNING INFORMATION AND COMMUNICATION TECHNOLOGIES

Designing new information and communication technologies involves a number of steps.

These include:

- identifying the problem
- doing research
- planning
- outlining the technological process
- making the technological device
- testing the technological device
- evaluating the technological process

REFERENCE

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