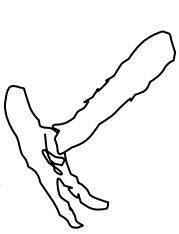
SCIENCE AND ELEMENTARY TECHNOLOGY FOR P6/2020

UNIT 1:MECHANICS AND BLACKSMITH TOOLS

Tool is anything we use to do work. Mechanic is someone who works with tools to repair and maintain machines. The mechanic produces the products in a place called a mechanical workshop. Blacksmith is someone who makes things from metal or repairs things made of metal.

1.1. THE COMMON MECHANICS TOOL

1



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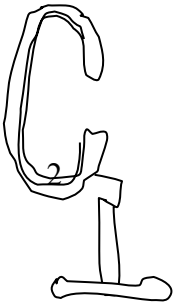

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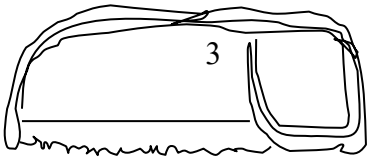

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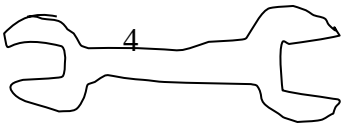
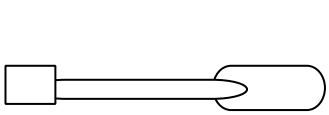
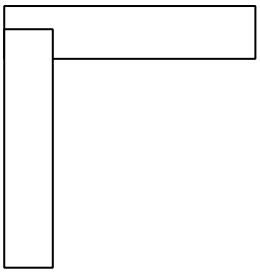
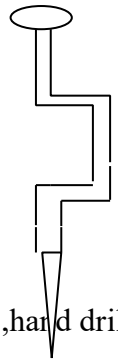








Hammer ,clamp ,saw ,spanner ,pliers , ,brace ,screwdriver ,chisel ,hand drill ,T-square ,rule ,borer

5

6

7

1.2.THE COMMON BLCKSMITH TOOLS

Bellows anvil blacksmith hammer ,blacksmith's pliers or tongs(drawings)

1.3A. *USE AND MAINTENANCE OF MECHANICS AND BLACKSMITH TOOLS *

TOOLS	*USES*	*MAINTENANCE*
Hammer	Driving nails into wood, breaking hard objects	Clean after use ,keep I n dry place
Clamp	Holding objects when cutting them	Clean after use ,keep in dry place ,oiling
Metallic Saw	Cutting metal objects	Clean after use ,keep in dry place ,sharpen
Screwdriver	Driving screws in the metals. The screws hold metal together	Clean after use,k veep in dry place
Spanner	Fastening or loosening bolts	Clean after use, keep in dry place
Pliers	Fastening or loosening bolts	Clean after use, keep in dry place
Hand drill & Borer	Making holes in the metals	Clean after use, keep in dry place,oil the movable parts
T-square	Cutting right lines on things for cutting them Checking and obtaining right angle	Clean after use, keep in dry place
Rule	Measuring the length of the things	Clean after use ,keep in dry place
Bellows	Strirring up the fire	Clean after use, keep in dry place ,do not make holes in skin, clean the nasal
Anvil	Helping to beat the metals for giving them the form	Clean after use ,keep in dry place
Blacksmith hammer	Giving the things different form	Clean after use, keep in dry place
Tongs	Taking the things in the fire	Clean after use ,keep in dry place

B.THE DANGERS OF THE MISUSE OF MECHANICS AND BLACKSMITH TOOLS

>Rotate at high speed and has sharp blade. The blade might slice off the users
>Throw back the pieces of metals which might hit the
users >Beat themselves the users when beating the metals
>Can trap the users' fingers. >Burn the body for the users
>Produce the poison from them

C.PRECAUTIONS WHEN USING THE MECHANICS AND BLACKSMITH TOOLS

>Do not bring the fingers or arms to the rotating blade

>Always wear the protective clothes (helmet ,goggles ,gloves ,…)
>Close the jaws of the clamp after using it.
>Do not place the hands near the cutting metals

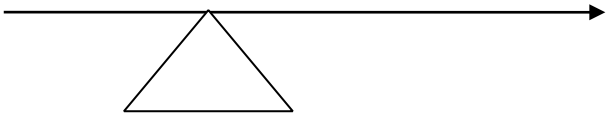
UNIT 2:SIMPLE MACHINES

2.1. DEFINITION OF SIMPLE MACHINE

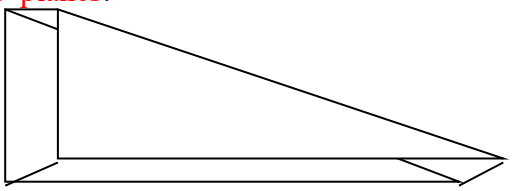
A simple machine is a tool that simplify the work. A simple machine is anything that makes the work easier. For a machine to do work ,a force called EFFORT is applied to it.

2.2. TYPES OF SIMPLE MACHINES

A)Levers:



B)Inclined planes:

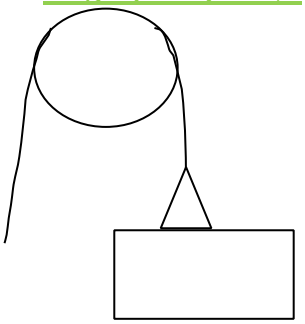


C)Screws:

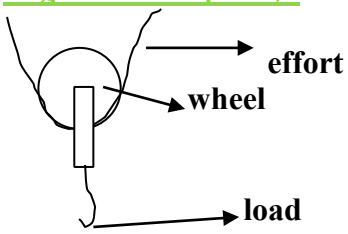
D)Pulleys: have four parts which are***: load, effort, rope/cable and wheel/Axle.***

Pulleys have three types:

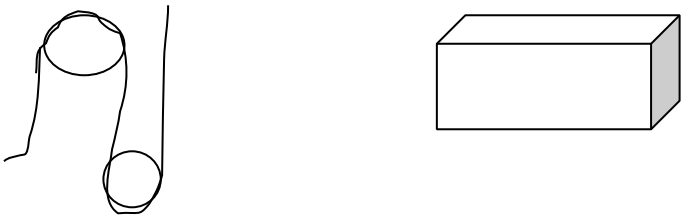
(i) ***Single fixed pulleys***



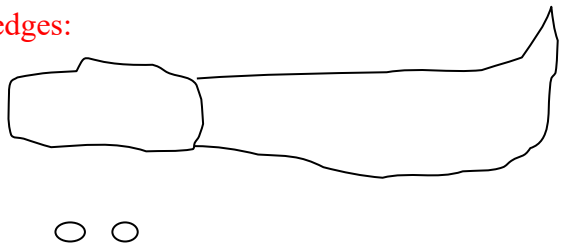
(ii) ***single movable pulleys***



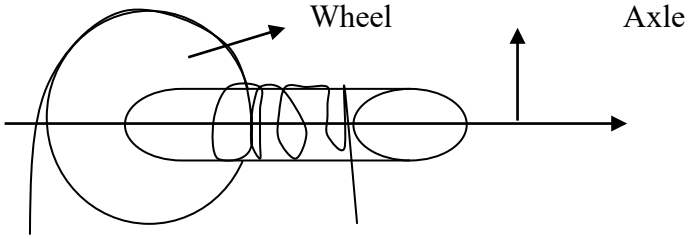
(iii) ***compound pulleys (Block and tackle system)***



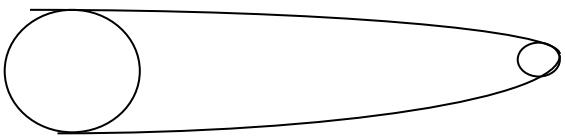
E)Wedges:



F)Wheel and axle:



G)Belt drives



2.3. SAFETY IN THE USE OF SIMPLE MACHINES

A.USES OF SIMPLE MACHINES

>use to fetch the water into borehole
>Trap the metals from the fire
>Fishing from the big water
>Move the machines and transport the materials.
>Fasten together two or more pieces of metals or wood
>Transport materials from lower to higher level.
>Use to cut the food and other things.

B.SAFE

>Be careful when using these machines.
>Rotate at high speed and has sharp blade. The blade might slice off the users
>Throw back the pieces of metals which might hit the users
>Beat themselves the users when beating the metals >Can trap the users' fingers.
>Produce the poison always wear the protective clothes before using them (helmet ,goggles ,gloves ,…)
>Do not bring the fingers or arms to the rotating blade
>Close the jaws of the clamp after using it.
>Do not place the hands near the cutting metals >Apply oil and grease to moving parts to reduce friction >Keep them in dry place.

2.4. LEVERS

2.4.1. DEFINITION OF LEVERS

A lever is a rigid object (a stiff bar) with a fixed turning point called a fulcrum (pivot).

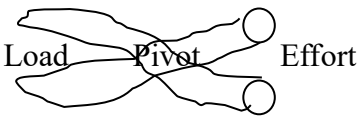
2.4.2. PARTS OF LEVERS

The parts of levers are fulcrum(pivot) load and effort. **The fulcrum(pivot)** is a turning point **the load** is the thing that is transported or where thing is **,the effort** is the force applied for transporting thing.

WORK = FORCE × DISTANCE
(joules) (newtons) (metres)

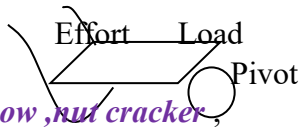
2.4.3. CLASSES OF LEVERS

-*1st class lever(class A)* : the fulcrum is in between load and effort. The load is equal (same distance) to the effort.



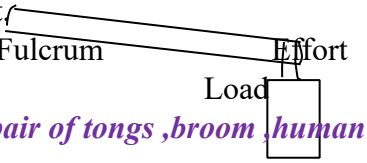
Eg: *Crowbar ,pliers ,seesaw ,scissors , craw hammer , weighing scale* ,…

-***2nd class lever(class B)*** :the load is in between fulcrum(pivot) and effort. The fulcrum is greater than effort and reduces the effort.



Eg: ***wheelbarrow ,nut cracker ,***

-***3rd class lever(class C)***: the effort is in between load and fulcrum(pivot). The load moves a long distance than the effort.



Eg: ***hoe ,fishing rod ,spade ,pair of tongs ,broom ,human arm***

Tools that are well maintained will also require less energy to work with.
Some ways in which simple machines are maintained are :
-keep all machines in safe place
-clean well after use
-oil and grease the movable parts of machines(friction) -always repair or replace any broken parts
-paint the machines to prevent machines from rusting -wash if possible.

UNIT 3:OBJECTS PRODUCTION

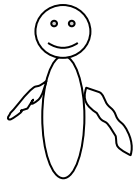
A toy is a something to play with especially for using by children.

3.1. MAKING TOYS

The toys are made in clay ,wires ,reeds ,sisal fibres ,banana fibres ,wood ,sticks and manila papers.

.in clay: dolls,animals

A doll and animal :for making it, it should made like this: -
observe the model of the doll that want to make
-press pieces of clay to form hands, legs and body of the doll
-using the big pieces of clay ,model the head ,legs and body of doll
-press the head and other parts of the doll made - after the doll is completed.
It is same on the animal



.in wires:motorcycle

A motorcycle in wire :for making it, it should made like this:
-fold pieces of wire to make the wheels
-make pedals by folding the wires
-make motorcyclist (someone who rides a motorcycle)
-put the motorcyclist frame on the model made
-with clothes ,glue and scissors to cut in pieces for making straps -the motorcycle is completed.

3.2. MAKING LEARNING MATERIALS IN PAPER & MANILA PAPER

***Learning materials** are anythings that are used in learning. For making them ,we use the following materials:-crayons -paints -glue -paper(manila) -pencils -scissors -razor blade -soft board.*

Among these materials there are shapes, polygons…
.Regular polygons&solids
For making the polygons and solids follow these steps:
-draw the shapes on manila papers
-after using the scissors to cut them because the shapes are ready for use.
-for solids, fold the parts with glue
-colour the shapes that want cut out
-stick the shapes on soft board or class wall using glue, cellotape , paper manche glue, flour paste glue.

3.3. MAINTENANCE OF UTILITY AND LEARNING OBJECTS

For avoiding injuries and last longer, it must:
-store them in the science corner
-stick them on the large manila and hang it on class wall
-store the solids in the boxes or shelves
-do not crash the objects used in paper
-do not spray the water on them because they break -keep them in dry and clean place.

UNIT 4:WRITING SKILLS

A. WORDPROCESSING

Using for writing letters, text, poem…

4.1. IDENTIFICATION OF ELEMENTS OF GNOME ENVIRONMENT

Gnome is a desktop environment that is composed entirely of free.
The elements of Gnome environment are :
***-desktop** (create a folder)*
For creating folder ,open the computer and open the new blank document and the window appears.
In the window there is two panels that tell the computer what to do.
***-panels**:*top panel : uses the applications, place, date, network and olpc user*
** bottom panel: minimize and maximize the work .*

4.1.1. Work with a document

After opening the window ,get the space that used for writing and write the message. The people can write ,draw ,delete ,etc.
The person also can save ,copy and paste. For saving in the journal ,use save –save aswrite the document's name-ok or press Enter or Ctrl+S

4.1.2. Folder management

To manage a folder ,we want to use password for stopping unwanted persons want to enter and also the particular name. The password can be letters, numbers, symbols etc

4.1.3. Identification of elements of abiword window

Abiword is the program used by XO laptop for writing the different texts. The elements of abiword(Microsoft word on the ordinal laptop) are these:

-abiword
-home .Recent:
.desktop .documents .library .download .music .pictures .Videos … -Devices
.computer
-Network(mozila)
For getting abiword window ,from the sugar interface follow these steps: *My settings
****switch on desktop***
****switch to Gnome***
****open abiword program***
****get ready abiword window and start to write the text.***

4.1.4. Text formatting

The Text formatting is the changing Text using the format commands. -the Bold (dark text)
-the Italic (bent text)
-the Underlined (line at the base of a word)
-the Font: *size (size of letter)
****style (bolded, italic, underlined)***
****colour (colours)***
****They are used for the word, sentence, paragraph or all text. For***
Font : -Bolding text : Ctrl +B
-Italizing text : Ctrl+I -
Underlining : Ctrl+ U

B. SPREADSHEETS

Using for tables and speed to put the column and cell.

4.2.DEFINITION AND ROLE OF SPREAD SHEET APPLICATION

In general tables are used to display data in table format. A table is an arrangement of text in grid of rows and columns. They organize information neatly in these rows and columns depending on the nature of the work there will always be a need to use tables.
The tables are easy to handle and edit. Every column is independent of the other, therefore Use the mouse , place the cursor to where wanted to put the information. To move from one cell to another ,use the arrow keys in the desired direction if entered a large text, the size of the cell will adjust/increase instead of jumping to another cell.

4.2.1. Spread sheet environment (Gnumeric spreadsheet <table>)

Spreadsheet show us the surface that put the information into the table. Spreadsheet has many components:

1.Title bar shows us the name of document

2.Menu(s) contain the commands that tell the computer what to do and how to do it (File, Edit, View, Insert, Format, Tools, Data, Help

3.Tool bar contains the commands used for naming, saving, changing, cutting, copying, pasting…

4.Scrol bar has Undo the last action ( ) and Redo the undone action( )
Undo return the previous action while Redo return where it is.

5.Formula bar (sum∑, insert, edit function, f(x) sort the selected region in ascending order based on the first column selected descending , zoom)

6.Status bar show the style of text in size, style, bold, italic, underlined, Align left, centre horizontally, Align right

7. Cell show where is the cursor, cancel change, accept change.

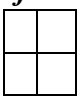
8. Active cell for getting the active cell, see it upper case that show us where it is.

9. Name box for name first –save-save as and you get where write the name of box or document .

10. Column heading and row heading for heading column and row.

4.2.2. Create ,save and open a workbook Cell basics

→For creating a workbook cell basic in Gnome environment, first go in the application, in office Gnumeric spreadsheet then click and get the sheet for working. The sheet facilitates to use the table. After writing, select all document, go to the border



And all document enter in tables.

→For saving, use Ctrl+S or click in File ,save ,save as, type the name of document then click OK and the name of document shown up.

→For opening the workbook ,find the name of workbook in recent document and click on the name existed or wanted.

****Create means to elaborate the new document.***

****Save means store the document in existing area.***

****Open means use or find the existed document for using again.***

For content, it can put the content in the cases made the tables. For entering, the content are put in the cases and for selecting use the control and arrow keys or left touch and slide in touchpad. After selecting ,it can copy the text and paste in other document or sheet .

4.2.3. Modifying columns ,rows and cells

Modifying means change the characteristics of document. It can change the size of rows in height, column in width, insert, delete rows and columns unwanted.

For changing the height of rows, click on the line under the row and pull down or up and it
Is the same on columns. For inserting (or deleting) the rows or columns, click in front of the row and up the column and click in insert then row or column appear, click in Format, then click in hide for deleting row and column disappear in the table.

4.2.4. Formatting a cell

The Formatting a cell uses the Font (bold, italic, underlined) and Text Alignment and orientation (left, centre, right) cell border and fill the colours, formatting numbers and text. For Font the text ,select case, row, column or cell and click in bold(B), italic (α), underlined(α). It is same on the Alignment ,after selecting ,click in Align = (left, centre, right).

4.2.5. Worksheet Basics

A . Insert means put the things on the work. It can insert the pictures, the rows and columns on the table, the text, etc… For inserting the picture, open the worksheet where want to put it, and go to where saved, select it copy(ctrl+c) or cut (ctrl+x) and return to the worksheet then click in paste (ctrl+v). For inserting rows and columns, click in front of row or up the column click in insert after the row and column appear.

Delete means erase/clean something on the work. For deleting, select word, sentence, wanted to delete then click in Format, and click column or row then click in hide then the column or row disappear. For deleting something using delete on keyboard.

B.Rename worksheet

Rename means change the name of document. For renaming click with right, get the icon, choice the rename ,click in it then write the name wanted and click OK.

4.2.6. Mathematical operators basics

Mathematic operators basics are addition, subtraction, multiplication, division. For applicating, it must have a table in spreadsheet and data to be used. The data must be numbers. There are many functions or formulas used in simple calculations like -sum product -average -maximum –minimum -etc *For Sum (addition), it needs to follow these steps:
-click or put the cursor where put the result
-click layout tab of the Ribbon

UNIT 5: COMPUTER RESEARCH 5.1. INTRODUCTION TO SEARCH ENGINE 5.2. SEARCH ENGINE TECHNIQUES

5.3. TYPES OF SEARCH ENGINES

7.Primary search engines: are the most popular search engines used in nowadats
8.Secondary search engines: are targeted at smaller, more specific audience although the content itsef is still general.
9.Targeted search engines (Topical search engine) are focused usually to a general topic like medicine, branches of science, travel, sports and other topic

5.4. EXAMPLE AND SEARCH ENGINES

1.General search engines(primary): Google-Bingo-Ask.com
2.Meta search engines (secondary or targeted): Dodpile –Metacrawler –webcrawler – sktscaner…
3.Yahoo
4.MMS search (Bingo)
5Wikipedia (Internet encyclopedia
6.Netscape (market)
7.Ask.com (questions and answers)

UNIT 6:PROGRAMMING FOR CHILDREN

6.1. TURTLE ART FOR DISPLAYING THINGS
6.2. DRAW IRREGULAR POLYGONS
6.3. PROGRAMMING ANIMATIONS AND COMPUTING IN SCRATCH
6.4. WORKING WITH THE STAGE
6.5. CREATE STORIES TO ANIMATION
6.6. SCRATCH WITH MATHEMATICS (simple computing)
6.7. IDENTIFICATION OF ELEMENTS OF ETOYS ENVIRONMENT
6.8. ETOYS BOOK
6.9. ETOYS PROJECTS AND ANIMATION

UNIT 7: AIR POLLUTION

Air is a mixture of many gases. The gases which make up air include: nitrogen, oxygen, carbon dioxide and rare gases(inert gases).

7.1. DEFINITION OF AIR POLLUTION

Air pollution means the releasing of dangerous substances into the environment. Also air pollution is the introduction of harmful substance into the air.

7.2. COMMON AIR POLLUTANTS

-industrial smoke
-fumes from the vehicles
-smoke from bush fire ,charcoal burners ,cigarettes ,fire wood smoke
-exhaust pipes
-gases from decomposing organic matter
-insecticide sprays
-earthquake
-volcanic eruptions

7.3. SOURCES OF COMMON AIR POLLANTS

-smoke from cigarette, charcoal burners (nicotine and tar are poisonous gases)

-smoke from vehicle exhaust pipes(carbon monoxide, nitrogen dioxide harm the body)
-dust in the air we breathe (it reduces the rate of photosynthesis and visibility on the roads)
-smoke from volcanoes (it reduces oxygen in the atmosphere)
-Air comes from toilet, latrines and compost

7.4. CONSEQUENCES OF POLLUTED AIR

-cause diseases to humans like tuberculosis, lung cancer, asthma ,bronchitis ,coughing and sneezing.
-death to humans because of carbon monoxide and nitrogen oxide that harm the body and accident caused by reducing visibility on the roads.
Eg: carbon monoxide
-damage to other living organisms (the crops and other vegetation are covered by dust that contain carbon dioxide and the plants reduce the rate of photosynthesis).
- global warming (increasing the warming in the atmosphere) caused by releasing the different gases in the atmosphere and causing the changement to the atmosphere.
Eg: carbon dioxide
-acid rain caused by the releasing the gases in the air and it rains with acids. eg: nitrogen dioxide
-destruction of atmosphere and destruction of the Ozone layer(layer of gases that protects Earth from the harmful rays)
Eg: chlorofluorocarbons(CFC's)

7.5. PROTECTION OF AIR AGAINST AIR POLLUTANTS

-water all dusty roads
-locate industries far where people live
-plant more trees to absorb excess carbon dioxide
-using clean source of energy
-using of air pollution device in industries.

UNIT 8:ANIMALS

The people struggle with financial problems and lack of food ,they keep animals like cows and goats because it is a good source of income and food.

8.1. CHARACTERISTICS OF A GOOD COWSHED / GOAT SHELTER

1-it should be safe from predators, thieves and trespassers
2-it should be constructed in a place where is good drainage to avoid diseases and infections
3-Cowshed/goat shelter should be located where a farmer can easily attend to cows and goats 4-They should be located where there is exposure to sunlight and away from strong wind 5-The floors should be made in a slanting manner for easy cleaning.

8.2. TYPES OF COW / GOAT BREEDS

1. COWS

a)Local breeds

1. ***Inyambo is the common local milk breed.***
    - ***It has large long horns***
    - ***It is a medium sized cow that produces small amount of milk.***
    - ***It is adapted to poor quality feeds and limited water.***

b)Foreign or Imported breeds

They can either be dairy breeds or beef breeds. The common foreign (imported) are :

A)For milk

1)Friesian

- it is black and white

-large body size

-produce large quantity of milk with low butter fat

2)Brown Swiss

-it is large white-brown

-produce large quantity of milk with considerable butter content

-it can withstand extreme cold and hot temperature

3)Jersey

-it is brown grey

-medium body weight

-produce large quantity of milk with high butter fat

4)Sahiwal

-it is brown-red with many folds on skin

-medium body size

-average quantity of milk -tolerant to heat and pests

B)For beef (meat only)

1)Hereford

-it is red with white face

-large body size

2)Aberdeen Angus

-it is black

-medium body weight

-short legs. It thrive well in highland

3)Shorthorn

-it is red-roan

-large body

-survives well in poor pastures

4)Zebu

-it has variety of colours
-small body weight
-Fatty hump on the shoulders and large dewlap
-heat tolerant

2.Types of GOATS

The goats are mainly kept for milk, meat, skin and manure.

1)Toggenburg
-white and grey colour
-weighs about 50-80kg
-kept mainly for milk
-gives 2-3litres of milk per day

2)Saanen
-white or cream in colour
-weighs about 40-50kg
-gives 2-3 litres of milk per day

3)Anglo-nubian
-roan-white in colour
-kept for both meat and milk
-weighs 60-70kg
-gives 1-2litres of milk per day

4)Boer: fast manure

5)Alpine goat: produce 3-4 litres of milk per day

6)Galla: long horns

****The local goat breed is the East African goat which has the following features:***
-variety colours
-small size of body
-kept mainly for meat
-tolerant for heat and poor pastures

8.3. CHARACTERISTICS OF CATTLE / GOAT BREED TO REAR

It should be healthy and resistant to diseases
It should be able to give high quality products
It should be well adapted to the prevailing climatic conditions in the area
It should be free from any physical defects
It should have a longer productive life
Avoid breeds with bad behaviours like kicking
It should have high productive ability(produce many calves or kids) Choose animals with good mothering ability

8.4. PROPER FEEDING OF CATTLE

They must feed on balanced diet that contains the carbohydrates, proteins, roughage, fats and oils, minerals and vitamins.

Element	***Source***
Carbohydrates	***Maize grains, wheat bran, molasses, grass, sweet potato vines, and maize stalks.***
Proteins	***Legumes such as lucerne, clovers and commercial feeds***
Fats and oils	***Cotton seeds, plant leaves, oats and sunflower seeds***
Minerals and vitamins	***Salt licks and bone meal***
Roughages	***Hay, green fodder, green pastures and straws and stalks from cereals***

Concentrates have high amount of proteins and energy.
Eg :- whole grains as wheat, oats, sorghum, barley, and sunflower.
-bran
-maize germ
-pollard
-fishmeal
-molasses

8.5. CATTLE HEALTH SANITATION CONDITIONS

Sanitation is the process of keeping the place free from dirt, infection and diseases. That help to prevent diseases and death of animals. Cattles diseases are spread through :
-contact with pests and other animals
-contact with contaminated water
-feeding on contaminated feeds
The cattle health conditions include proper cleaning of house shed by collecting wastes and properly disposing it.

8.6. COMMON DISEASES OF CATTLE / GOAT

There are infectious diseases and others caused by parasites a)Parasitic diseases :They are caused by parasites
A parasite is an organism which lives in or on another organism(host). They suck the nutrients from the organism it lives.
Eg : East cost fever, anaplasmosis, pneumonia and trypanosomiasis.
b)Infectious diseases
These are diseases that spread from one animal to another by contact or through the air.

Diseases	Signs and symptoms	Prevention/treatment
(i)East coast fever	.Swollen lymphatic glands .High body temperature .Weakness in the animals	.Dipping or spraying to control ticks .Treat affected animals with antibiotics
(ii)Anaplasmosis	.Rise in temperature .Constipation	Dipping or spreading to control ticks
(iii)Trypanosomiasis/ Nagana	.High fever .Loss of appetite .Body weakness .Teary eyes .Anemia followed by death	.Clearing bushes and use of insecticides to control tsetse flies. .Use drugs to give animals protection.
(iv)Pneumonia	.Coughing and difficulty in breathing .Loss of appetite and dullness .Nasal discharge .Milk yield drops drastically	.Provide soft feed .Early cases are treated with antibiotics
(v)Mastitis	.High temperature .Clots in milk .Swollen teats and udder	.Treat sick cows using antibiotic .Maintain high hygiene .Milk sick cows last .Disinfect milking place and milking equipment.
(vi)Anthrax	.High temperature .Blood oozes from all body	.Vaccination of healthy animals
	openings .Muscle tremors .Sudden death	.Burning carcasses .Quarantine

8.7. PREVENTION OF COW / GOAT DISEASES

1)Always keep the cowshed or goat shelter clean
2)Disinfected before bring a new flock or herd
3)Quarantine sick cattle/ goats to control spread of diseases
4)Clean and disinfect feeding, watering and milking equipment
5)Feed the cows and goats properly on clean well-balanced feeds 6)Add preventive drugs to cattle/goat feeds or drinking water. 7)Vaccinate by veterinary and treat the sick animal

8.8. IMPORTANCE OF CATTLE / GOAT FARMING

a)economic importance

Give us the meat ,milk ,hides ,skin and also sold to earn income.

They change in other products for selling, using in factories and exported to earn country foreign exchange. The people also get the wages and salaries. Eg: shoes, glue making industries…

b)agriculture importance

They produce dung ,manure and the synthesis of biogas. Oxen are used in the farm for ploughing and pull carts.

c)Social importance

Cattle and goats demonstrate wealth status. They are offered in marriage and also in recreation as bull fighting.

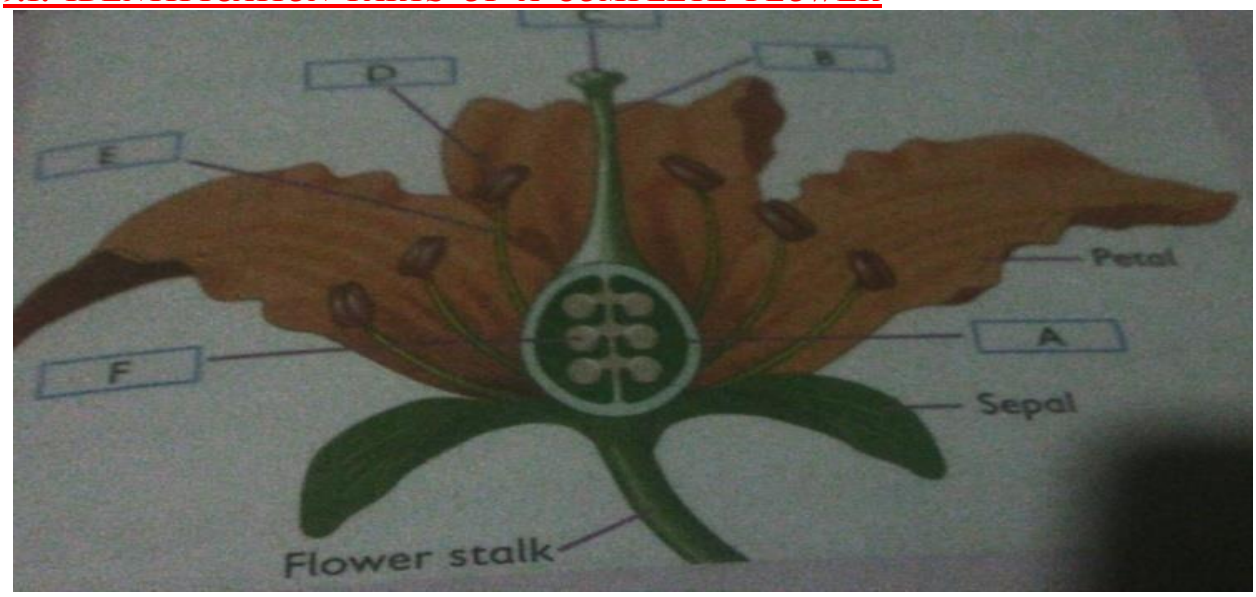
d)Nutritional importance

Cattle and goats are source of food. They give also milk and meat which give the proteins.

UNIT 9:PLANT REPRODUCTION

A plant has many parts such as roots, stem, fruits, leaf (leaves) and flower.

9.1. IDENTIFICATION PARTS OF A COMPLETE FLOWER



The flowers are the reproductive parts of a plant. The complete flower has three major parts:

A) External flower parts :

(i) Sepals: they are green leaf and they protect the young flower at bud stage. A group of sepals are called calyx

(ii) Petals: they are coloured outer parts and attract agents of pollination. They are called corolla

(iii) Flower stalk: it holds the flower to the branches of the mother plant. B) Male reproductive parts:

The male parts of flower are called stamen. They have:

(i) Filament: thin stalk that holds the anthers in position.

(ii) Anthers: they produce the male sex cells called pollen grains.

(iii) Pollen grain: are the male sex cells. C) Female reproductive parts:

The female parts of flower are called pistil. They have:

(i) stigma: it receives pollen grains from the anthers.

(ii) Style: thin stalk joins stigma to ovary.

(iii) Ovary: it produces the female sex cells called ovules.

(iv) Ovules: they are female sex cells that form seeds after fertilisation.

9.2. DEFINITION OF PLANT REPRODUCTION

Plant reproduction is the production of new plants from the parent plants. There are two types of reproduction in plants: Sexual and Asexual reproductions.

9.3. SEXUAL AND ASEXUAL REPRODUCTION OF PLANTS

Sexual reproduction involves fusion of male and female sex cells(pollen grain and ovules) to produce offsprings. The plants that reproduce sexually produce flowers. A complete flower has male and female parts.

Asexual reproduction is where the new plant forms from part(s) of the mature plant.

.PROCESS OF THE SEXUAL REPRODUCTION OF FLOWERING PLANTS

Sexual reproduction in flowering plant involves the following processes:

a)Pollination :The transfer of pollen grains from the anthers to the stigma. There are two types of pollination:

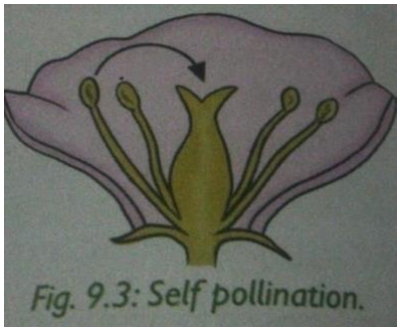


Fig. 9.3: Self pollination.

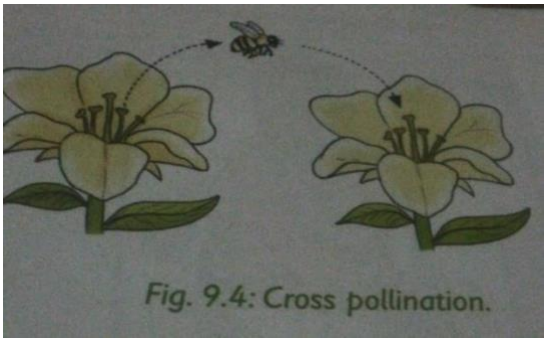


Fig. 9.4: Cross pollination.

-1- self pollination: is the transfer of pollen grain from the anthers to the stigma on the same plant or of another flower of the same plant.

-2-cross pollination: is the transfer of pollen grain from the anther of one flower to the stigma of flower on a different plant but of the same type. The cross pollination is facilitated by agents of pollination like wind, insects, birds, water and human beings.

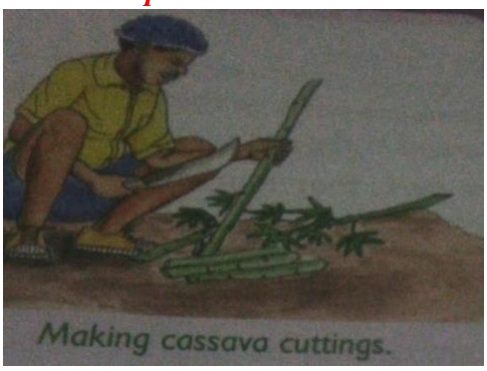
b)Fertilisation: is the union (joining) of the male and female sex cells.

When the fertilisation has taken place ,the ovules become seeds and the ovary becomes the fruit.

c)Seed dispersal : the seeds move away from the parent plant. It reduces the nutrients. It can be :
-1-through self-explosive mechanism means on their own
-2-by animals the seeds attach on their bodies
-3-by wind the seeds float in air -4-by water the seeds carry by water
d)Germination: means the development of seed into seedling(young plant). It depends on the conditions like water(moisture), air(oxygen), temperature(warmth).

.ASEXUAL REPRODUCTION METHODS

Asexual reproduction is also called asexual propagation and means establishing a new plant from the parts of parent plant.
Asexual reproduction methods include: (a)Cutting:


Making cassava cuttings.

-parts of plant are cut and plant in the soil. It can use the roots, stems or leaves.
The stem cutting should have the bud which develops into a shoot.
Eg: cassava, sugarcane, sweet potatoes,

(b) Grafting:
-plant comes from a small branch of another plant. It is cut in such a way that makes a V-shaped cut. The scion is then fixed to the roots stock of a young plant and tied tightly.
Eg: avocado and orange…

(c) Layering and marcotting:

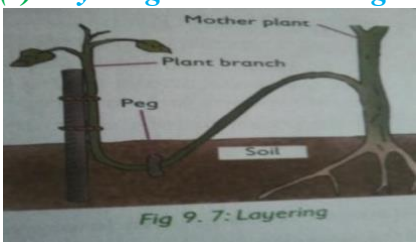
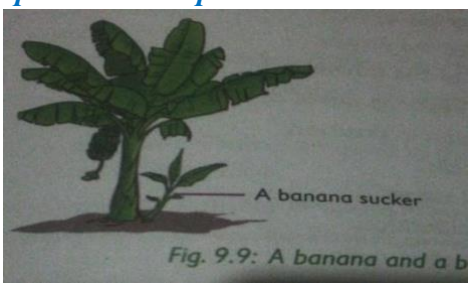


Fig 9. 7: Layering

****Layering***
-the branch of plant is bent carefully and covered with soil until the roots develop and the new plant can be cut off and be transplanted elsewhere.
****Marcotting***
A ring is cut around a tree branch with organic manure around the ring ,the roots appear and the marcot is cut off and planted somewhere else.

(d)Suckers

They are the small plants that grow at the base of a mature plant and they can be uprooted and planted elsewhere.



9.4. REASONS FOR PLANTS REPRODUCTION

-plant reproduction prevents some plants from becoming extinct.
-controlled reproduction improves quality of offsprings.
-plants reproduction ensures constant supply of food to animals. -plants produce the oxygen we breathe.

UNIT 10:SUSTAINABLE WASTE MANAGEMENT

Waste refers to materials that are considered unimportant or valueless.

10.1. CLASSIFICATION OF WASTE

They are classified as:

a)Hazardous waste.

They are waste that can damage environment and be harmful to the health of human beings, animals and plants.
Eg: gas from industries, farm and in homes, medical waste, radio-active materials, human faeces…

b)Organic type.

Organic waste is also called degradable waste.
Eg: food remains, human and animal waste, peeling of fruits, rotten vegetables, other plants or animals based products.

c)Recyclable type.

They can be processed to make new products which collect and take to factories to make other products.
Eg: old tins, glass bottles, papers, damaged electronics, dirty water, scrap metals, tyres among others…

10.2. SOURCES OF WASTE

There are many sources of waste:

(a) Municipal source of waste

They are waste made up of items discarded by the public. They are collected by municipal council trucks and disposed in areas known as dumpsites. It is also called garbage.

(b) Agriculture source of waste

They are come from the agricultural activities and can be biodegradable or nonbiodegradable.

Eg: crop remains, pesticides, herbicides, fertilizers, contaminated water, animal remains, containers for chemicals, expired chemicals,

(c) Waste from automobiles

They are waste produced from vehicles, motorcycles, tractors, wires, used engine oil, tyres.

(d) Construction sources of waste

They are unwanted materials produced by industries.

Eg: old nails, parts of iron sheets, empty cement bags, broken tiles and bricks, wood, soil, … (e) Electronic sources of waste

They are come from electronic and electronic devices.

Eg: old or damaged DVD, television, telephones, computers, vacuum cleaners,…

(f) Industrial sources of waste

They come from industries as raw sewage, solid waste, industrial fumes(smoke). They harm the aquatic life, animals, plants and human being.

(g) Medical waste

They are coming from medical supplies like gloves, needles, bandages used, expired drugs, empty drug containers and bottles, old and broken medical equipment.

10.3. WASTE MANAGEMENT TECHNIQUES

Waste management refers to collection, transportation, processing or disposal of waste materials to minimize their negative effects in environment.

(a) Professional garbage collection

The garbage is put in bins or garbage bags.

(b) Safe waste transportation

They use the trucks and lorries to transport waste for preventing the spilling while on transit.

(c) Proper waste processing

It refers to the biological, chemical and mechanical methods used to control:

****Changing chemical composition of waste and medical waste.***

****Removing environmental pollutants from industrial and municipal.***

****Treating sewage before discharging it is septic tanks.***

(d) Maximum reuse and recycling

Reuse means using waste product for another purpose.

Recycling is process of waste materials to make new products.

(e) Composting

Organic waste are decayed to form the manure and they used to add nutrients to the soil and improves yield.

UNIT 11:CIRCULATORY SYSTEM

Circulatory system helps us in the moving of the blood all over the parts of the body.

11.1. MAIN FUNCTION OF CIRCULATORY SYSTEM

The main functions of circulatory system include:

-Carry oxygen to body cells and remove carbon dioxide.
-Carry the digested nutrients to the cells of the body.
-Carry waste from body to excretory organs.
-Help to protect the body from diseases.
-Transport the hormones
-Transport the heat from body cells to the body.

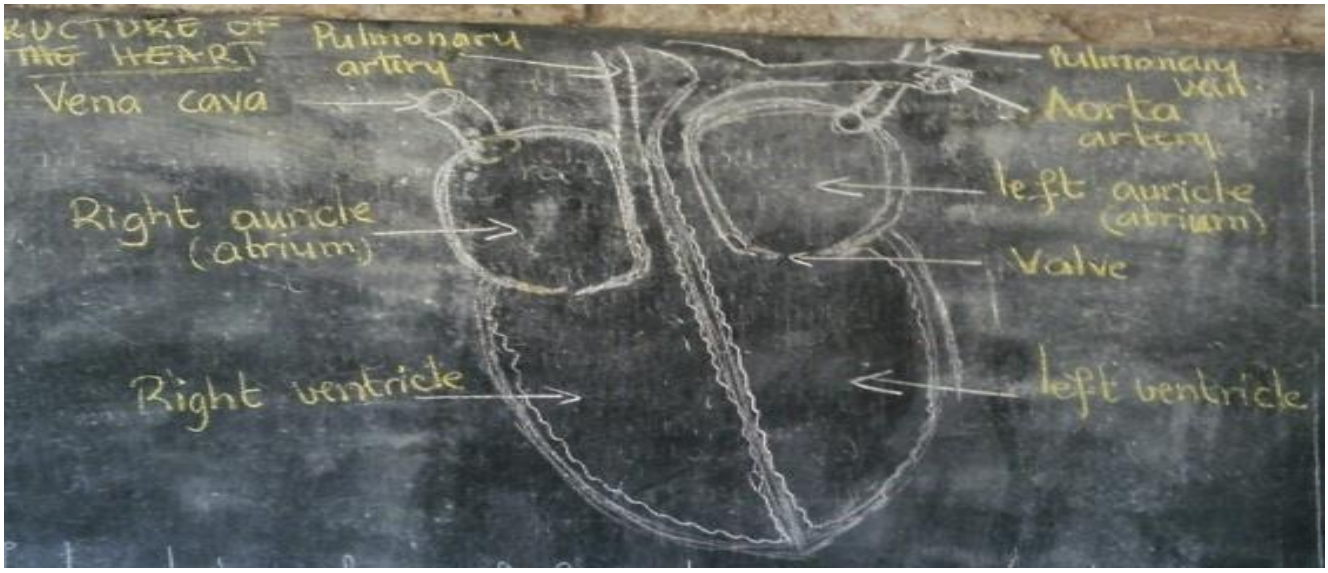
11.2. ORGANS OF CIRCULATORY SYSTEM

The circulatory system is composed of the heart, blood and the blood vessels.

- ***The heart is the muscular organ that pump the blood to all parts of the body.***
- ***Blood is the red fluid that flow in the body.***
- ***Blood vessels are the tubes through which blood flows.***

The other support organs in the circulatory system are the lungs.

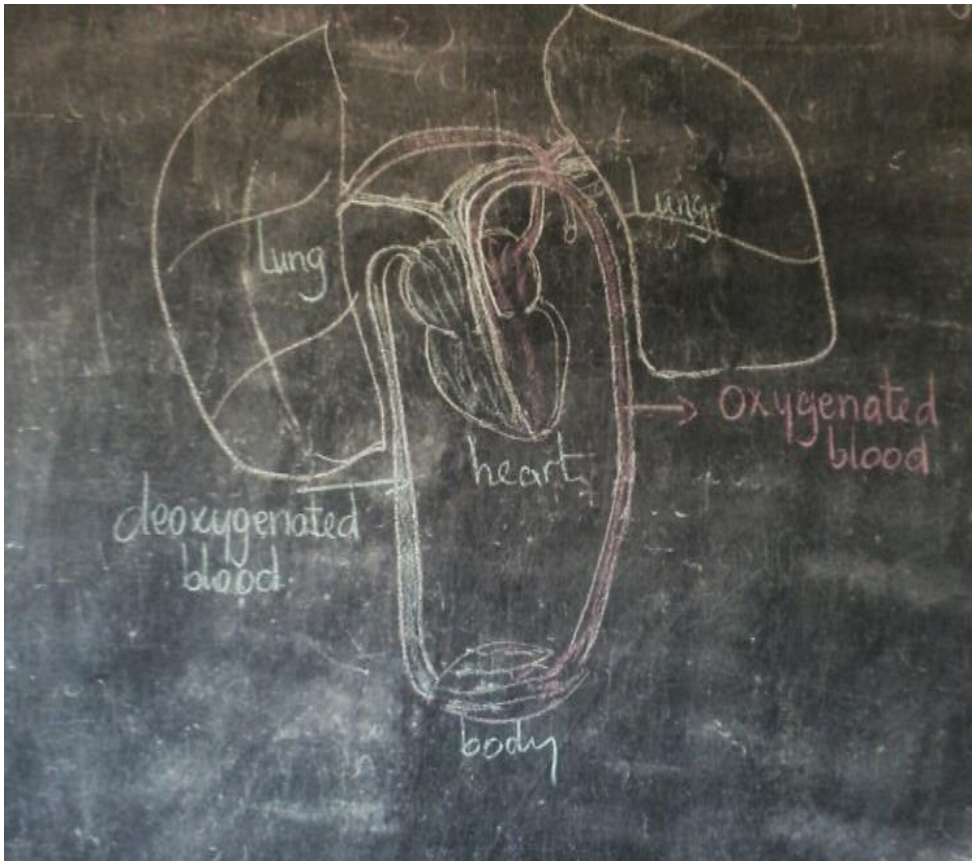
11.3. STRUCTURES OF THE HEART



The heart is made up of four chambers :2 upper chambers called auricles and 2 lower chambers called ventricles . The right side of the heart is served by the vena cava and pulmonary artery while left side is served by the aorta artery and pulmonary vein.

11.4. THE PROCESS OF BLOOD CIRCULATION & BLOOD VESSELS

The blood is pumped to all parts of the body.



***The right auricle** receives **deoxygenated** blood from **the body** through the **vena cava** and then the **right ventricle pumps** it through **pulmonary artery** to the **lungs**. The blood releases **carbon dioxide** to the **lungs and picks oxygen**. This process is called **pulmonary circulation** or **small circulation**. Then the **oxygenated blood** flows from the **lungs** back to the **heart** through the **pulmonary vein** into the **left auricle**. Then the **left ventricle pumps** the **oxygenated blood** through **aorta artery** to all parts of the **body**. This process is called **systematic circulation or long circulation**.*

11.5. THE BLOOD VESSELS AND COMPONENTS OF BLOOD

The blood flows** round the body through the tubes called blood vessels. There are **three** major **types of blood** vessels : (a) **Arteries

Arteries carry the blood from the heart to all parts of the body. The main artery is the aorta. All arteries carry blood rich in oxygen (oxygenated blood) except the pulmonary artery which carries deoxygenated blood.

(b) Veins

Veins carry blood from all parts of the body to the heart. The main vein is the vena cava. All veins carry deoxygenated blood except the pulmonary vein which carries oxygenated blood from the lungs to the heart.

(c) Capillaries

They are small blood vessels which connect arteries and veins. They also allow digested food substances and oxygen to leave the blood and enter tissues.

The blood is red fluid that flows into the body. The components of blood are four :

(a)plasma

It is the pale yellow liquid part of blood which have most water and contains the digested food substances, salt, urea, hormones and carbon dioxide.

(b) red blood cells

They contain a red colouring matter called haemoglobin which gives red blood and help to carry oxygen from the lungs to the body organs.

(c) white blood cells

They are the soldiers of the body. They fight and kill the germs which can cause diseases and help get better when we are sick.

(d)platelets

They help in clotting of blood(coagulation) for stopping bleeding from wounds and cuts.

11.6. CARING FOR OUR BODIES AND HEALTH

The people need to do the following for getting good health of body:

****Have enough sleep***
****Eat balanced diet***
****Exercise regularly***
****Live in clean environment***
****Take the rest when tired***
****Avoid injury the body to avoid external internal haemorrhage***
(haemorrhage is flowing of blood out of blood vessels)
****Get regular medical checkups***
****Avoid smoking , use of alcohol and drugs.***

11.7. DISEASES /CONDITIONS OF CIRCULATORY SYSTEM

The circulatory system needs care for function properly. If we do not take care ,it may be affected by diseases like:

1.heart attack

It occurs when blood supply to parts of the heart muscle is cut off. It can cause death.

2.high blood pressure

The blood flows through narrow arteries at high pressure. It can be caused by smoking ,being overweight, lack of exercise or taking too much salt in the diet.

3.stroke

The blood supply to parts of the brain is cut off. It can lead to paralysis or death.

4.Atherosclerosis(hardening of the arteries)

The arteries become clogged up by fatty substances which cause arteries to be harden and narrow and the blood interferes flowing to the heart.

5.deep vein thrombosis

The formation of blood clots in veins in the body mainly the legs. It causes pain and swelling in the affected area.

11.8. BLOOD PRESSURE MEASUREMENT

Blood pressure can be high(hypertension) or low(hypotension) ,for measuring that used blood pressure meter. For measuring the blood pressure using the hospital, pharmacy or at home.

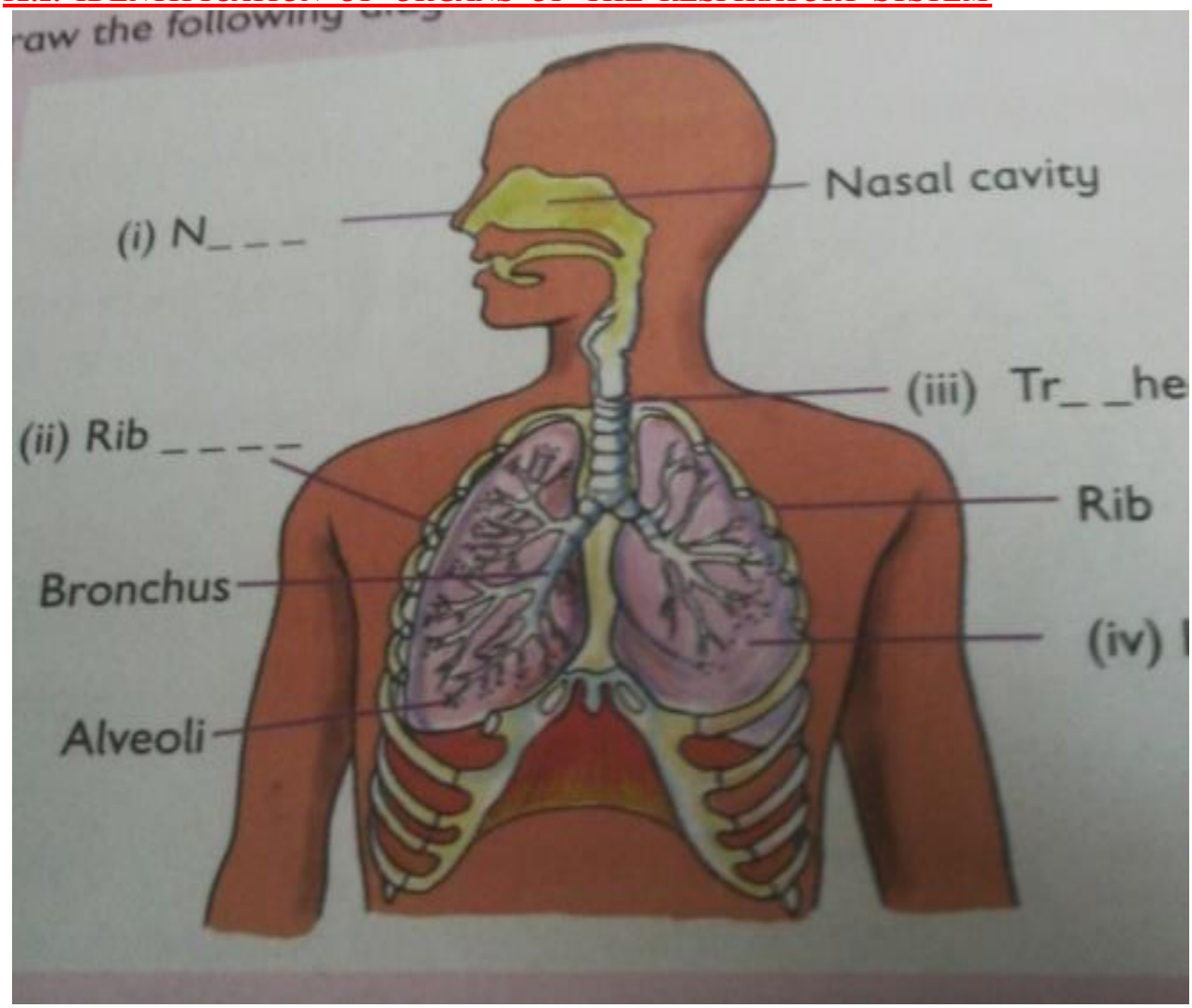
UNIT 12:RESPIRATORY SYSTEM

Breathe means respire is the moving oxygen into the lungs and carbon dioxide out of the lungs.

12.1. MAIN FUNCTION OF RESPIRATORY SYSTEM

We breathe in (inhale or inspire) oxygen and breathe out (exhale or expire) carbon dioxide. The human respiratory system is made up of organs responsible for taking in oxygen and removing carbon dioxide.

12.2. IDENTIFICATION OF ORGANS OF THE RESPIRATORY SYSTEM



The main organs of the respiratory system are:

. Nose: allow air to enter into the body
.Bronchi: connect bronchi to bronchioles
.Lungs: site of gaseous exchange.
.Trachea (windpipe): passage of air from nose to lungs

***.Bronchioles*: connect bronchi to airsacs(Alveoli)**
.Alveoli

12.3. MECHANISM OF RESPIRATION(BREATHING)

***Respiration has two movements*:**

(a) ***Breathing in (Inspiration/inhaling)***
During breathing in the ribs move upwards and outwards. The diaphragm contracts and moves downwards. The volume of the chest cavity increases and the lungs expand allowing in air.

(b) ***Breathing out (Expiration/exhaling) during breathing out the rib cage moves downwards and inwards. The diaphragm moves upwards. It reduces the volume of the chest cavity and increase the pressure on the lungs. Air pushes out and lungs deflate.***

12.4. GOOD HEALTH PRACTICES AND BEHAVIORS

To maintain a health system, the following measures should be considered:
-Exercise regularly
-Avoid smoking or inhaling drugs such tobacco..
-Live in clean environment away from dust, smoke, and other pollutants
-Wear protective gear when spraying chemicals
-Get immunized against diseases like tuberculosis
-Ventilate well house to avoid staying in overcrowded rooms
-Clean the nose with clean handkerchief

12.5. DISEASES OF RESPIRATORY SYSTEM

***(a) Tuberculosis*: is caused by bacteria. It is spread from an infected person to a healthy one through the air. It affects the lungs but can also affect other parts of the body.**

****Signs and Symptoms***
.Persistent(prolonged) coughing
.Coughing up blood
. Chest pain and pain with breathing or coughing
.Blood stained sputum or spittle
.Loss of weight
.Fatigue and loss of appetite

****Prevention***
.Vaccine at the birth with BCG
.Vantilate well houses
.Boil milk before drinking
.Sprinkle water when sweeping
.Seek immediate treatment when sick.

(b) Cough :is an action the body takes to get rid of substances that are irritating the air passages.

Coughing can be triggered by:
(i) Respiratory tract infection
(ii) Allergy on substance like smoke and dust.

***(c) Asthma**: is caused by inflammation of the respiratory tract and make the narrow airways. It can be caused by smoke, dust, fumes, chemicals and other air pollutants.*

*Signs and symptoms

.Coughing with shortness of breath.
.Difficult in breathing
.Wheezing sound when breathing in
.Chest tightness or pains
**Control and prevention*
.Avoid substances that trigger allergy.
.Exercise regulary.

***(d)Bronchitis**: is the inflammation of the lining of the bronchi. It may be as result of exposure to smoke, dust, other pollutants.*

*Signs and symptoms

.Coughing up much yellow-grey mucus
.Wheezing, shortness of breath and having blocked nose
.Fever
.Chest discomfort
.sore throat

**Prevention*
. Avoid inhaling dust and smoke
.Live in well ventilated house
. Seek medical treatment when infected to stop the spreading .

***(e) Pleurisy**: is the inflammation of the pleural membrane (layer which cover the lungs and lines the rib cage). It can be caused by viral infection (influenza) ,by bacteria infection (pneumonia) or fungal infection or also by lung cancer or rib fracture.*

*signs and symptoms

.Extreme pain when breathing
.Shortness of breath
.Coughing
.Fever
.Chest pain
Treatment: it can be treated with antibiotics

12.6. SUFFOCATION(definition ,causes ,first aid)

***Suffocation** is difficult in breathing or inability to breathe. The victims cough non-stop and have difficult in speaking.*

Causes of suffocation

-choking: blocking of the windpipe by food that prevent flowing of air into lungs

-drowing : water prevents air from reaching the lungs

-carbon dioxide inhalation

-the hotness of some places

-drug overdose.

****first aids for suffocation***

-loosen the clothing around the neck

-take the victims to an opened place to take fresh air

-perform abdominal thrusts

-if the person is unconscious, lie on a flat floor for getting clean air and perform chest compressions

-make the resuscitation (mouth to mouth) if breathing is stopped

12.7.Effects of smoking

The smoke remains into the lungs toxically substances like

1.Tar: sticky dark brown substance which stains teeth, lungs and airways

2.Nicotine: substance which causes addition

3.Carbon monoxide: interferes oxygen transportation into blood All can also cause the lung cancer .

UNIT 13:REPRODUCTIVE SYSTEM

13.1. MAIN FUNCTION OF REPRODUCTIVE SYSTEM

-The main function is to create new life (survival of human race) They are internal and external reproductive organs:

13.2. MALE REPRODUCTIVE EXTERNAL ORGAN

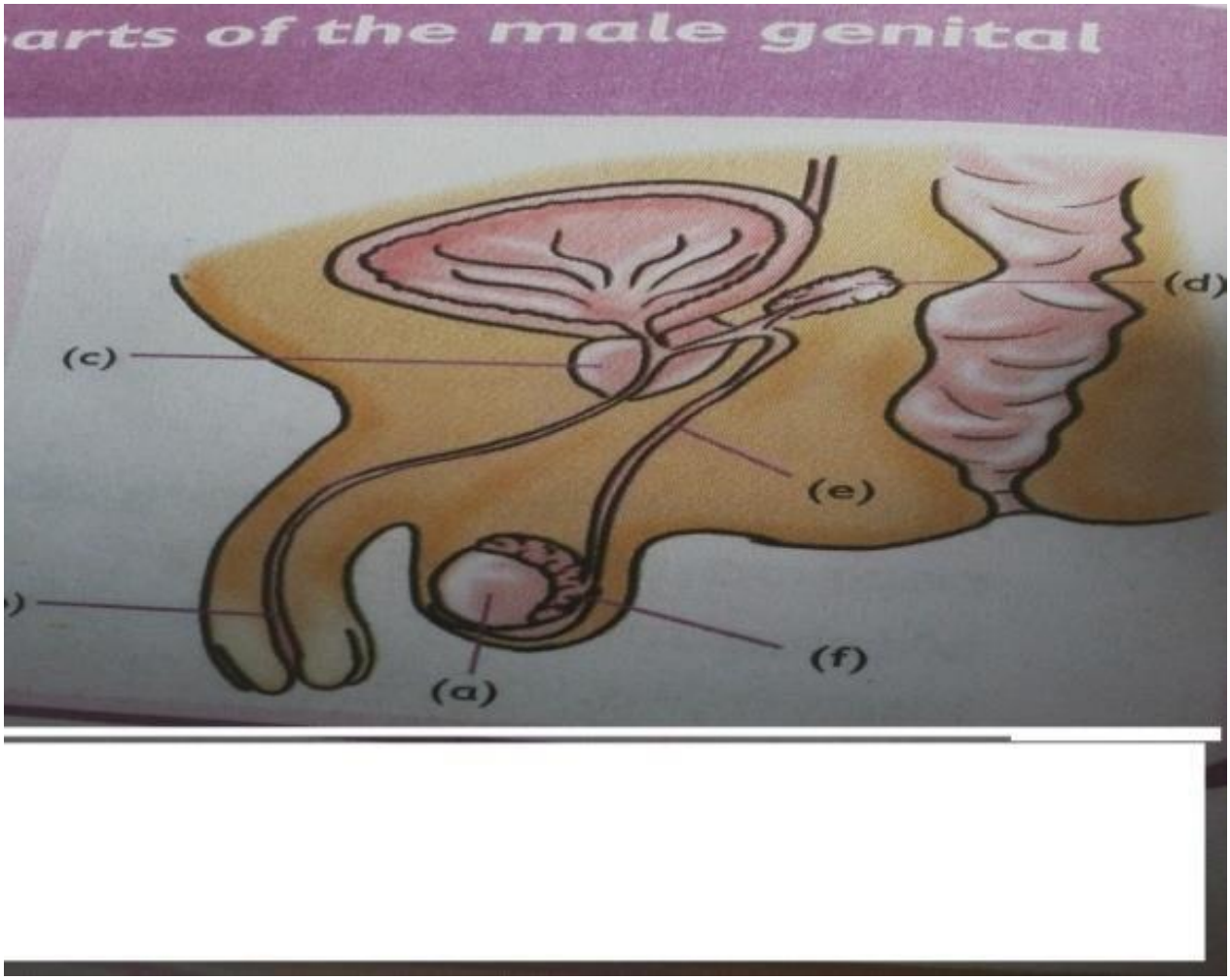
External parts:*scrotum: bag (skin) where testes are contained

****testes: they are two. They produce sperms.***

****Penis: tube organ that deposits sperms into vagina.***

13.3. MAJOR INTERNAL PARTS OF MALE GENITAL ORGANS

Internal parts:

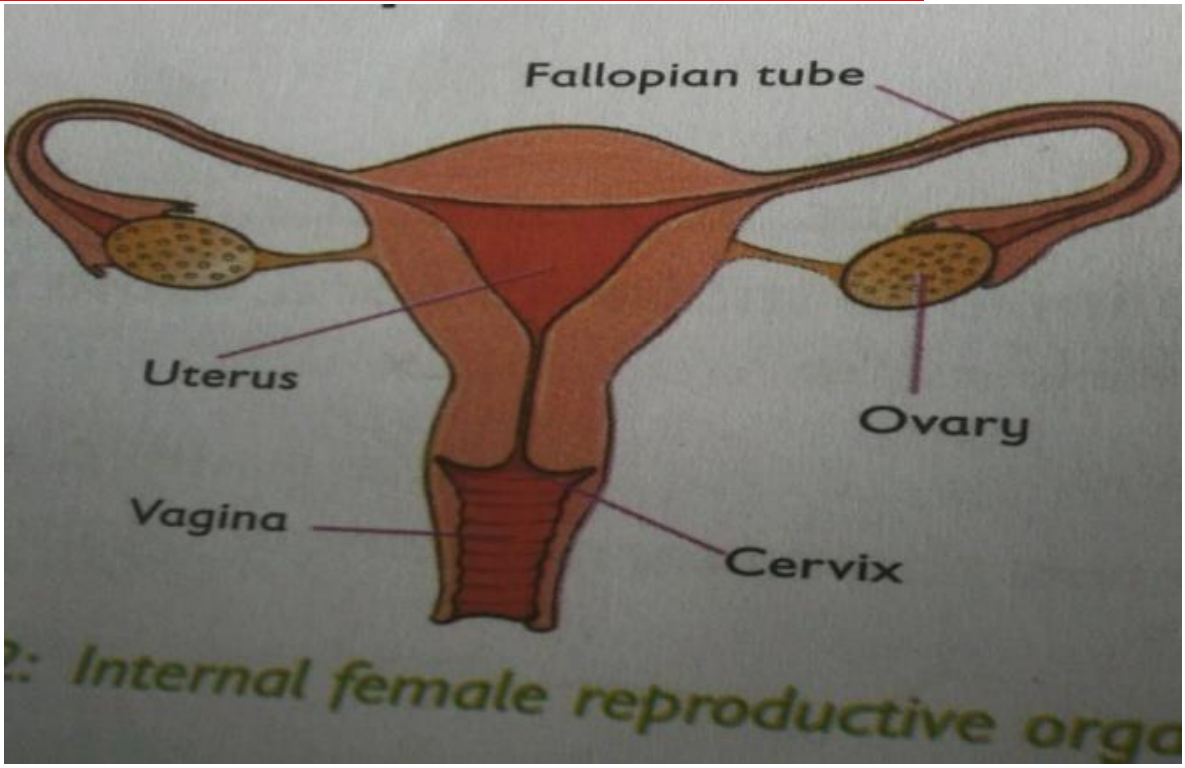


***a)Vas deferens*(sperm duct): tube carries sperms from the testes**
***b)Testes*: produce the sperms.**
***c)Seminal vesicle gland*: it produces seminal fluid which transport the sperms into.**
***d)Prostrate gland*: also produces seminal fluid**
***e)Urethra:* tube that carries the sperms and urine from the body to outside.**

13.4. MAJOR EXTERNAL FEMALE GENITALIA VULVA

The external female genitalia and their functions are:
***a)Labia majora:* they are thick folds of skin which protect softer tissues of vulva.**
***b)Labia minora*: they are nerve endings that provide sensation and lubrication during sexual intercourse.**
***c)Urethra*: tube that carries urine from the bladder to outside of the body.**
***d)Bartholin's glands*: they lie near entrance of the vagina. They secret mucus to lubricate the vagina.**
***e)Clitoris:* a fold of skin at the top of labia minora which provide the sensitive area on the vulva.**

13.5. MAJOR INTERNAL FEMALE REPRODUCTIVE ORGANS



The functions

1)Vagina(birth canal):

-receive the penis and the sperms in the vagina during sexual intercourse

-passage of baby during birth 2)Ovaries:

-they produce eggs(ova-ovum) for fertilisation and reproductive hormones.

3)Fallopian tube(oviducts):

They are tubes in which fertilisation takes place.

4)Uterus:

The pouch in which a fertilised egg(ovum) develops into foetus(baby) until it is born.

13.6. PREVENTING UNPLANNED PREGNANCY

What is pregnancy?

Pregnancy is when woman has a baby in her body. For this, there are many ways for woman to be pregnancy:

1.The ovarian cycles

When a female reaches puberty, the ovaries mature and start releasing egg(ova) that process is called ovulation.

It occurs once in 28days and so on. One ovary left releases an egg at a time at the second the right ovary does (ovarian cycle).

**** For boys, they reach puberty ,starting wet dreams(ejaculation) . Ejaculation occurs as result of the contraction and relaxation of the muscles of the penis and other related organs. Through ejaculation ,the sperms move out through liquid called semen. It takes place when the penis erects(it becomes hard and firmly for entering into vagina).***

2.the uterine cycle

In ovulation, the uterus starts undergoing of changes in preparation to receive a fertilised egg.

.formation a new cell(placenta)

.accumulation of blood to supply food and oxygen to foetus.

If there is no fertilisation, in 14days after ovulation, the new cell and blood break down and come out of the body through the vagina called menstruation.

If the ovulation takes place , the sperm meets with an ovum (zygote) in process called fertilisation in oviduct(fallopian tubes). After this process, the zygote moves down into uterus and fixes to the wall of the uterus through the process called implantation. Then the zygote starts to develop into embryo and after foetus(baby) through the process called gestation. Gestation period is nine months(280 days). While in the uterus, the foetus lies in a fluid called amniotic fluid and connect to mother with umbilical cord. After the gestation ,the baby is ready for birthing, the cervix relaxes and the birth canal (vagina) widens to allow the baby to pass through.

A)Ways of preventing unplanned pregnancy

The pregnancy is the time when a young one develops into a woman belly. It occurs after sexual intercourse.

The unplanned pregnancy is a pregnancy that is not planned for or is unwanted at the conception.

Unplanned pregnancy can be prevented by:

1)Abstinence: not engage in sexual intercourse

2)Having correct information about sex to avoid sexual exploitation.

3)Use of the contraceptives like condom, oral pills, coils, spermicides, injection, vasectomy …

B)Consequences of unplanned /early pregnancy

a. Health consequences

-laughed at others

-poor care to her child in her youngest

-excessive bleeding when abortion

-even death

b. Social consequences

-drop out without study as well

-rejection by family and society

-cause the using of drugs and alcohol overcome shame and disappointment

C)Dangers of illegal/ unsafe abortion

Abortion means removing the not developed pregnancy . The dangers of abortion are:

-haemorrhage and even death

-injury and damage the reproductive parts like cervix, uterus

-infection due to incomplete abortion or use of contaminated equipments

-injure the internal organs like bladder and rectum. This can result in stool and urine incontinence .

-may cause spontaneous abortion or complete infertility later on.

13.7. SEXUALLY TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs) are diseases that are passed from one person to another through sexual intercourse.

(i)Gonorrhoea

It is caused by bacteria called gonococcus. It is characterised by pain and burning sensation when passing urine. It produces a thick foul smelling discharge from the genitals.

(ii)Syphilis

It is caused by bacteria called treponema pallidum. It is characterised by appearance of painless sore on the genital. It can also attack eyes ,heart and the nervous system that lead to blindness or illness if not treated.

(iii)Chancroid (soft chancre)

It is caused by bacteria called haemophillus ducrey. It is characterised by appearance of painful sore called chancre on the genitals. There are lymph nodes around the genital swell and become painful.

(iv)Candidiasis

Caused by a fungi . Symptoms commonly appear in women. It is characterised by vaginal itching and production of a thick white-yellow discharge from vagina.

(v)Herpes simplex

Caused by virus. Is characterised by appearance of small blisters around genitals and anus. After appear around the mouth after a cold.

(vi) HIV and AIDS

HIV and AIDS is caused by HIV virus.
HIV means Human Immuno-deficiency Virus Human means that the virus attacks humans not animals
Immuno-deficiency means the virus stops the immune system from functioning well.

AIDS means Acquired Immune Deficiency Syndrome
Acquired means it passes from one person to another
Immune is protection of the body
Immune deficiency means loss of the body ability to fight infections
Syndrome means AIDS infection is characterised by different symptoms which may vary from person to person.
For knowing that the person is infected using a HIV test. HIV virus attacks and weakens the body's mechanism, the body becomes weak, it can be attacked by many diseases and the person becomes very sick known as opportunistic infections we say the person has AIDS.

(vii)Trichomonas

It is caused by bacteria called vaginalis trichomonas. It is rare and is characterised by scratching, white or grey-yellow vaginal discharge, smelly itching for the genital and pain during sexual intercourse.

13.8. MEANS OF TRANSMISSION OF COMMON STIs/HIV

They are the ways /methods of transmitting or getting the Sexually Transmitted Infections from one person to another.

13.9. IDENTIFICATION OF VARIOUS WAYS FOR STIs/HIV TRANSMISSION

STIs and HIV and AIDS can be transmitted in:
(i) through sexual intercourse with an infected person
(ii)sharing cutting tools and contaminated piercing like needles, razor blades… (iii)mother to baby during pregnancy, at birth or when breast feeding.
(iv)transfusion with contaminated blood
(v)contact with body fluids like blood, semen, fluids from wound or cuts

13.10. PREVENTION AND TREATMENT OF COMMON STIs/HIV

A)Prevention of STIs, HIV and AIDS
(i)Abstinence from sexual intercourse.
(ii)Faithful for the partner in married couples.
(iii)Creating public awareness about the diseases
(iv)Using condoms properly when having sex
(v)Not sharing cutting or piercing tools
(vi)Visiting health centres to know and take counselling about STIs and HIV status. (vii)Not contact with body fluids from infected people.
B)Treatment of STIs
-Visit a doctor if there is itching or unusual discharge from the vagina or penis
-Take the antibiotics for STIs caused by bacteria
-STIs caused by fungi are treated by applying antifungal creams or inserting tablet in the genital.
-STIs caused by viruses are not treated and it can take medication to reduce the severity of diseases.
-For HIV and AIDS ,take the drugs called ARTs(Anti-retroviral Therapy) that combine 3drugs in one pill.
The infected person takes the drugs everyday throughout his/her life. ARTs are obtained in nearby medical facilities. There is no cure for HIV and AIDS. ARTs slow down the growth of HIV viruses and stop make copies.

13.11. LIVING POSITIVELY WITH HIV and AIDS

HIV and AIDS is a viral disease and has no cure nor vaccine. The infected people should live positively with the virus like:
-take ARTs and any other drugs as instructed
-visit the doctor frequently for check-up
-carrying on with normal activities(avoid stress)
-eat balanced diet daily -exercise regularly.

UNIT 14:ENERGY MANAGEMENT

14.1. DEFINITION OF ENERGY

***Energy** is defined as the ability to do work. Energy is measured in units called Joules.*

14.2. FORMS OF ENERGY(and examples)

***Energy** is classified according to its source or according to work it does.*

(a)Mechanical energy

It is the energy of objects due to current position and ability to move. An object that has mechanical energy is able to do work. Eg: hammer,…

(b)Chemical energy

It is stored in substances. This energy is released during chemical reactions. Eg: dry cells, peat, battery, food, fuel…

(c)Thermal (heat) energy

It is produced by burning of fuels like firewood, charcoal, kerosene, plant remains and gas.

(d)Electrical energy

It is produced when there is flow of electric current in a conductor. Electricity also flow through electric wires and energy is produced when turbines are rotated by water or wind… Eg: dry cell, electric circuit…

(e)Elastic energy

It is a form of energy produced when a material is stretched or squashed.

(f)Electromagnetic energy

It is produced from objects in form of magnetic or electrical waves that travel through space.
Eg: x-rays, microwaves, radio waves, ultraviolet rays,…

14.3. ENERGY TRANSFORMATION / ENERGY CONVERSION

Energy transformations involves changing one form of energy to the other.
(a) Thermal energy ⟶ Mechanical energy
The fuel that is used to run machines and automotives is burnt in oxygen to produce heat(thermal energy). It makes the machines to move or work. Eg: kerosene in car,…

(b) Mechanical energy ⟶ Electrical energy
A windmill rotates to produce electricity. In hydroelectric plant, it used the water to turn large blades (turbines) connected to a generator. Eg: hydroelectricity, windmill…

(c) Chemical energy ⟶ Thermal energy

The body breaks down and transforms it from chemical energy to heat energy which keeps our body warm. The fuels as firewood, charcoal, gas or kerosene are burnt ,the chemical energy in them is transformed into heat energy. We use heat energy to heat water, cook, heat in homes, iron…

(d)Chemical energy ⟶ Electrical energy

The dry cells used in torch or radios change chemical energy into electric energy which flows through the wires. Eg: torch, radios,…

(e) Solar energy ⟶ Electrical energy

Energy from the sun trapped by solar panel cells and convert this energy into electrical energy.

(f)Electrical energy ⟶ Thermal electrical energy

Some electric appliances like electric kettle and electric heaters convert electrical energy into thermal energy.

(g)Electrical energy ⟶ Mechanical energy

Some machines operate by converting electrical energy into mechanical energy of motion(move).

Eg: electric trains, blender, electric fan,…

14.4. IMPORTANCE OF ENERGY

- facilitates movement of people and goods
-help plants and animals to grow
-provides light in homes for reading and cities
-provides heat for cooking
-provides heat for ironing clothes
-warms the homes in coldness
-helps to play music on radios and television
-uses to power vehicles for transporting
-uses in factories and industries to operate machines

14.5. SOURCES OF ENERGY

****the sun * the wind *the water***
**** the biomass(the biogas, waste from plant, animals and alcohol fuel)***
****the fuel like kerosene ,trees, charcoal, firewood, oil and gas***

14.6. RENEWABLE ENERGY

Renewable energy is obtained from a source that cannot be washed out or depleted when used frequently.

14.7. SOME RENEWABLE ENERGIES

a)The sunlight: energy from the sun to produce electricity
b) wind energy: it turns generators to produce electricity
c) rain energy: flowing water from lakes and rivers possesses mechanical energy which rotates turbines to generate electricity in hydro-electric power stations.

d) ocean waves: are caused by wind as blows across the ocean by electricity generators placed near oceans.

e) geothermal energy: heat from interior of Earth. The steam rotates turbines to generate electricity used for heating building and homes. f)trees are source of fuel for cooking

14.8. SOLAR ENERGY

(a)the sunlight

Energy from the sun (main source) is also known as solar energy.

Solar panel

It is the material used to transform solar energy into thermal energy. Solar energy can be absorbed and transformed into electrical energy. The solar panel contains photovoltaic cells that absorb sun rays and transform them to electrical energy. The electrical energy can be transformed into chemical energy and stored in batteries that serve as storage centre.

Maintenance of Solar installation

1.Ensure that the solar panel is held firmly in safe position.

2.Ensure that it is exposed to maximum sunlight by removing all litter that may fall on it.

3.Inspect all panels regularly.

4.Replace or repair faulty parts of the solar panel.

The appliances that use solar energy include a solar drier, a solar heater.

14.9. USE OF SOLAR ENERGY & BIOGAS

a)Uses of solar energy

-used by plants to make their food (photosynthesis)

-source of warmth and light

-used to dry clothes and harvested crops

-used to heat water in solar boilers b)

Biogas

It is the energy obtained from the decomposing organic matter like dung, urine,…

Production of biogas

The mostly biogas is made from animal droppings and dung. That gas is prepared in a special tank called a biogas digester. After getting biogas, it is collected in tank for use.

Domestic uses of biogas

-Biogas uses for cooking and lighting homes and remained solid waste used as manure.

Advantages of installing biogas

-help to minimise environment pollution

-is a clean source of energy because it does not produce smoke

-remained waste used to fertilise soil

-saves wood fuel

14.10. ADVANTAGE OF USING RENEWABLE ENERGY

-it never runs out

-it is environment friendly

-it is reliable

-it is cheaper and more economical than other sources

-it requires less maintenance -it stabilizes energy price.

UNIT 15:MAGNETISM

15.1. TYPES OF MAGNETS

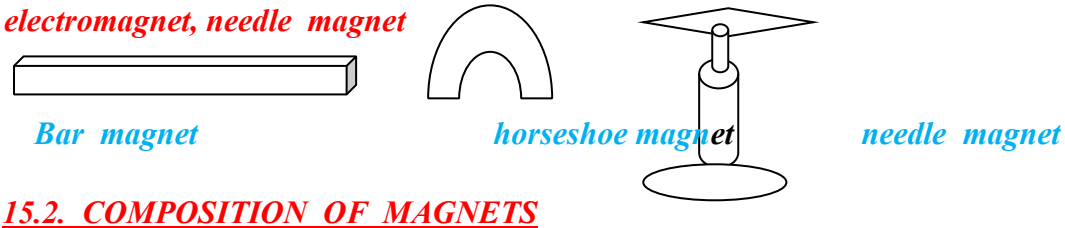
A magnet is a type of metal which can attract other metals like iron, steel… There are two types of magnet:

A)Natural magnets

These are magnetic materials that occur naturally. Eg : lodestone The earth is magnetic itself.

B)Artificial magnets

They are human- made magnets. They may be temporary (short time for their properties) or permanent (long period for their properties).eg : bar magnet, horseshoe magnet, electromagnet, needle magnet



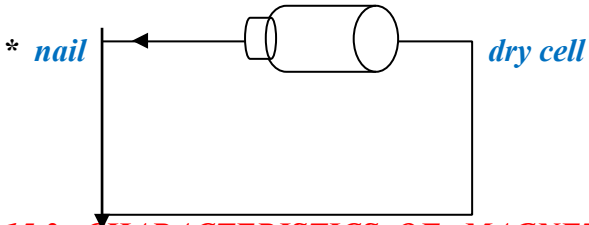
Bar magnet horseshoe magnet needle magnet

15.2. COMPOSITION OF MAGNETS

The nails become the magnetised through stroking and are able to pick magnetic materials like needle. Magnets are made from iron or steel, because both are magnetic materials. Iron is used to make temporary magnets because it is easily to lose its magnetic force while steel is used to make permanent magnets because it is hard to magnetise but is able to retain its magnetism for long.

*For making temporary magnet using nail

-rub the permanent magnet against the paper clip or nail
-continue rubbing the paper clip or nail with magnet for about 50times.
-take the paper clip or small nails



15.3. CHARACTERISTICS OF MAGNETS

1.Magnets are strongest at the poles
2.Magnets have two poles: the north pole and south pole
3.Like poles of magnet repel while unlike poles attract 4.Magnetic forces can pass through non-magnetic materials but cannot pass through magnetic materials
5.Magnets can lose their magnetic force if stored wrongly, heated or hammered.

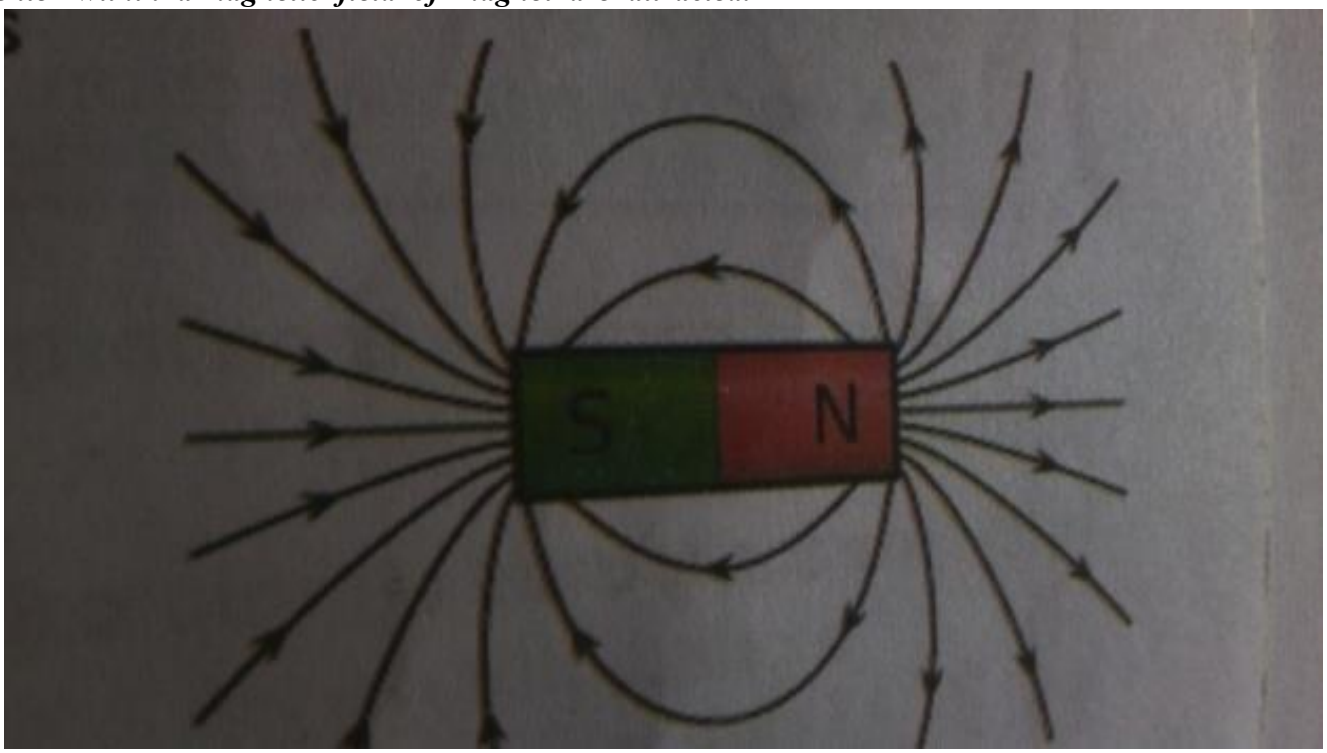
15.4. MAGNETIC FORCES AND MATERIALS

Magnetic forces are attracting or repelling forces between a magnet and magnetic material or a magnet and a non-magnetic material respectively.

Materials that are attracted by the magnet are called magnetic materials such as iron ,steel ,chromium and nickel. The objects made from these metals are attracted by magnets. The materials that are not attracted by magnets are called non-magnetic materials like wood, soil, plastic, plant materials.

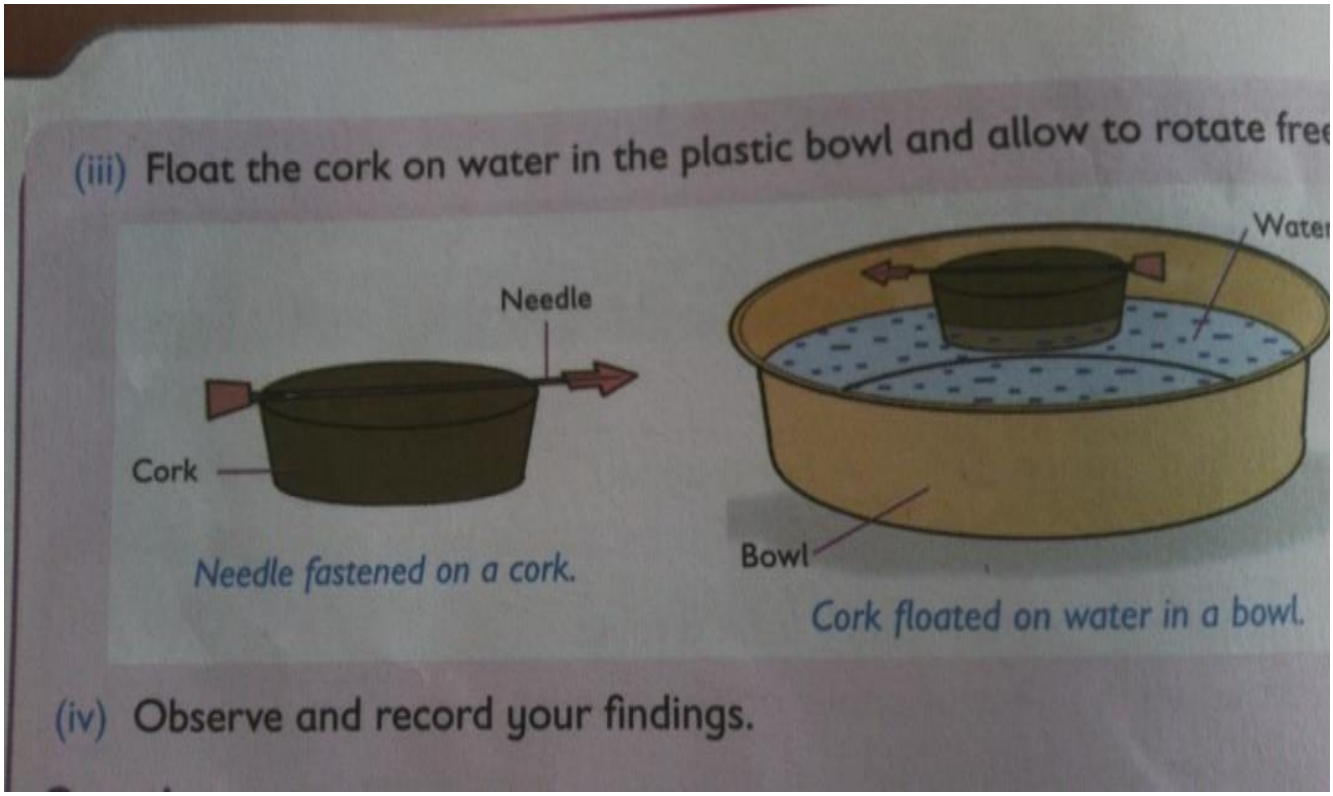
15.5. DEFINITION OF MAGNETIC FIELD

The magnetic field is where or space magnetic force act for attracting the things around the magnet. The magnetic forces operate within a magnetic field. Magnetic objects that enter within a magnetic field of magnet are attracted.



15.6. MAGNETIC COMPASS AND ITS USES

A magnetic compass is an instrument containing a magnetised pointer. The pointer shows direction. It is commonly used by ship captains to help in navigation on seas and oceans. The needle will rest in a North-South direction.



15.7. USES OF MAGNETS

- used in radios, televisions and mobile phones to attract sound
-used in separating mixture of magnetic and non-magnetic materials
-used in generation of electricity
-used in electronic motors. Motors are used to convert electric energy to motion
-songs and pictures are stored in CD,VCD,DVD in magnetic form
-used in hospitals to remove magnetic objects from the body -used to find lost items like needles, keys and pins.

UNIT 16:STATES OF MATTER

16.1. DEFINITION OF MATTER

Matter is any thing that has mass and occupies space. Everything around us is made up of matter. Matter can exist in form of gases, liquid or solid.
Volume is the where that putting something.
For measuring volume of substance:
-record the measurements length, width, and height
- Volume = Length x Width x Height (V=L x W x H) is measuring in cm3 for regular solids
-Volume of liquids uses measuring tube and the process called displacement. -Volume in gases uses flask and measuring cylinders Mass is the capacity or weight of substance.
For measuring the mass, we use a beam balance or weighing scale.

16.2. IDENTIFICATION OF DIFFERENCES BETWEEN THE THREE STATES OF MATTER

Matter exists in three states as solids, liquids and gases and they differ in shape and volume.

property	solid	liquid	gas
Volume	Has a define fixed volume	Has a define fixed volume	Does not have a fixed/ definite volume
Shape	Has a define shape	No define shape	No define shape
Arrangement of particles	Particles held in a fixed position	Particles are fairly close	Particles are far apart

16.3. IDENTIFICATION OF CHANGES BETWEEN THE THREE STATES OF MATTER IN WATER

Matter can change from one state to another state. Change in states of matter caused by decrease or increase in temperature.

(a)Melting

Ice is water in frozen state(solid). The ice cubes melt when heated, they change and become liquid.

This process is called melting . it requires increase in temperature.

(b)Evaporation/ Boiling

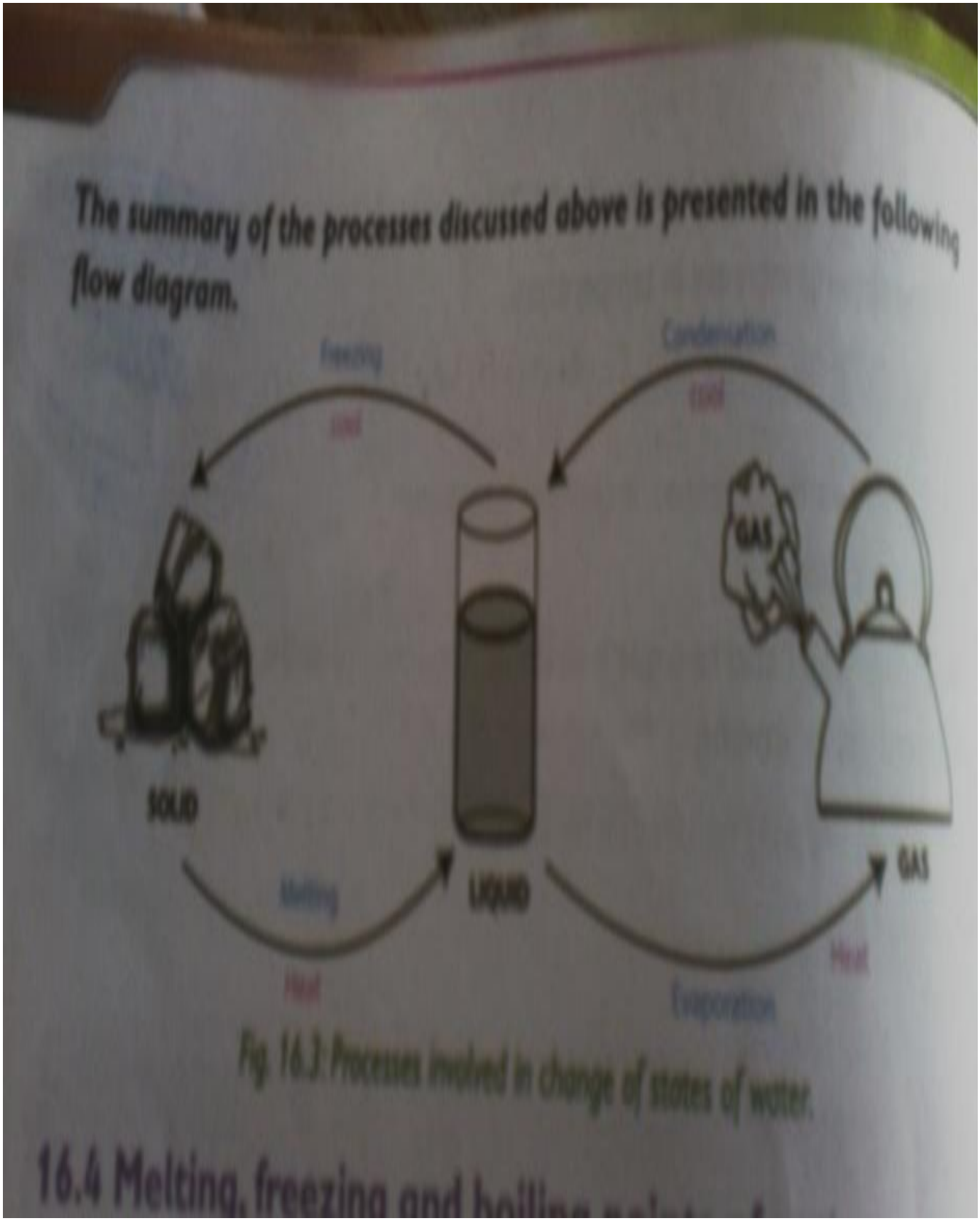
When liquid water is heated, it changes into water vapour or steam. This change of liquid to gas is called evaporation or boiling. It requires increase in temperature

(c)Condensation

When the water vapour is cooled, it changes back to liquid water again. This is called condensation. It requires decrease in temperature.

(d)Freezing

When liquids are cooled to certain temperature, they become solids. Water put in a freezer cools and becomes ice. This is called freezing. It requires decrease in temperature



16.4. MELTING,FREEZING AND BOILING POINTS OF WATER

(a) Melting point

Melting point *is the temperature at which a solid completely changes into a liquid. The melting point of water is 100C at 1 atmosphere pressure. At 100C ,the ice melts and to a liquid.*

(b)Freezing

Freezing point is the temperature at which all liquid changes into solid. Liquid water changes to ice when the temperature drops to 0C at 1 atmosphere pressure. The freezing point of water is the 0C.

(c)Boiling

Boiling is the change in state from liquid to gas due to heating. When water is heated to its boiling point, it changes to become water vapour. The boiling point of pure water is 100C at sea level but at about 93C at a higher altitude area.

16.5. CHANGES IN STATES OF WATER IN THE WATER CYCLE

A water cycle is also called a hydrological cycle. There is a constant circulation of water between the atmosphere, plants, the earth's surface and water bodies (oceans).
Evaporation : the sun heats water from bodies and plants, make water vapour and rises up into atmosphere through evaporation.
Condensation: Water vapour condenses in the lower atmosphere to form rain clouds and fall from these clouds as rain.

16.6. TRANSFORMATION OF STATES OF MATTER

1. Transformation of states of matter in iodine
Sublimation and deposition
The iodine changes of state from solid to gas(vapour) on heating. When iodine crystals heat, they become iodine vapour.
When iodine vapour cools it forms iodine crystals known as deposition.(gas change into solid)

2.Transformation of state of matter in naphthalene
Not only water that transforms from solid to liquid state then gaseous state, Naphthalene also behaves this way.
Melting : when it is heated, it melts to form liquid.
Evaporation : liquid transforms into gaseous when heated
Condensation: gaseous changes into liquid when cooled
Freezing: liquid changes into solid when exposed to low temperature.

UNIT 17: urinary system

17.1. Main function of urinary system

The urinary system is made up of organs that eliminate waste from the body in form of urine.

17.2. Organs of urinary system

The major organs of the urinary system are:

(i)The kidneys(2) : purify the blood
(ii)The bladder: stores urine until it gets out when is full
(iii)The ureters : transport urine from kidneys to bladder
(iv)The urethra: carries the urine outside the body

17.3. Kidney and its functions ***The parts of kidney are:***
1.Renal artery : carries the blood from the body to the kidney 2.Renal vein : transports the blood purified to the body
3.Pelvis :
4.Medula: contains the purified blood
5.Cortex: where the blood is purified.
The kidneys are the organs shaped like beans and situated at the back of abdominal cavity near the spinal column.
The main functions of kidneys are:
-filter the blood to remove waste products from the body. The major waste products are urea and uric acid.
-help to maintain the correct amount of water and salt from blood in the body

17.4.Hygiene of urinary system
-bathing regular to prevent germs
-taking plenty of clean water
-exercise regular
-eating right quantity of food, too much protein and salt overwork the kidneys
-avoid drinking too much alcohol for over work of kidneys
-abstain from pre-marital sex
-avoid excessive drinking of juice which have artificial preservatives, food flavourings, sweeteners and other chemicals for over work of kidneys

17.5. Beverage
The beverage refers to any type of drink we take apart from water.
There are two types of beverage
A)Alcoholic which make people drunk like beer, wine, primus, miitzig ,Vodka, Whisky, Gin, Liquor …
B)Non-alcoholic which do not make people drunk such as milk, soda, tea, fruit juices, Cereal drinks… refresh and quench thirst

17.6. Importance of beverage

-. eg: fruit juices like orange, lemon, mango juice,… -
stimulate the working of organs like heart, brain -feel
warm such as tea, coffee, cocoa and cola, …
-add the nutrient to the body. Eg: milk, egg drinks and cereal drinks -replace
lost fluids. Eg: tea, coffee, cola, milk drink and cereal drinks.

17.7. Alcoholism

Alcoholism is a condition caused by the continued and habitual drinking of too much alcohol. A person who is unable to stop the habit of drinking too much alcohol is called alcoholic.

17.8. Effects of alcoholism

a) Individual:

-lose appetite for food and becomes malnourished
-engage in irresponsible sexual behaviours which can lead to sexually transmitted diseases
-lose respect in the community.
-not observing personal hygiene
-develop problems with organs like brain, liver, kidney, stomach and heart.

b)Family

-lead to violence or constant fighting in the family
-lead to failure of parents to provide the basic needs like clothing and education -lead to divorce or broken marriages

c)Community

-increase in crime rate eg: rape and muggings
-spread of sexually transmitted diseases like HIV/AIDS -poverty
-accidents.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END !!!..