KAZO DISTRCIT LOCAL GOVERNMENT

EDUCATION AND SPORTS DEPARTMENT

P.7 SCIENCE LESSON NOTES TERM II 2023

LESSON ONE

TOPIC: EXCRETORY SYSTEM

S.TOPIC: EXCRETION AND ORGANS OF EXCRETION

Read and write (Excretion, waste products, Excreta, Excretor, carbon dioxide)

Definition of a system:

A group of organs specialized to perform a similar function.

Examples of body systems

- Digestive system
- Reproductive system
- Muscular and skeletal
- Circulatory system
- Respiratory system
- Excretory system

EXCRETORY SYSTEM

Excretion:

Is the removal of waste products from the body.

Excretory system: Is the body system that deals with the removal of waste products from the body.

Organs of excretory system and the wastes they excrete

- The skin (Excess salts, Lactic acid, Excess water as sweat)
- The kidney (Nitrogenous compounds e.g. urea, uric acid, excess water and excess salts all as urine)
- The lungs (carbon dioxide and water vapour)
- The liver (bile pigment)

ACTIVITY:

1. Define the following as related to excretion

a) Excretory system

b) Excretion

c) Excreta

2. Identify any five systems of the body

3. Identify the waste products removed from the body by the following excretory organs

a) Liver

b) Kidney

c) Lungs

d) The human skin

LESSON 2

TOPIC: EXCRETORY SYSTEM

S. TOIC: THE HUMAN SKIN

Read and write.

- Dermis
- Epidermis
- Pore
- Nerve

Illustration of the structure of the skin. Ref: (Baroque integrated sci BK 7 Pg 90)

Layers of the skin

The skin is made up of two main layers

- Epidermis
- Dermis

1. Epidermis:
   This is the outer most layer / region of the skin
   This epidermis is made of these sub layers
   I. Cornified layer
   II. The granular layer
   III. The malpighian layer

Cornified layer.

It is found in the top surface of the skin

It consists of dead cells that offer resistance to damage and bacterial invasion.

Granular layer.

Contains living cells that gradually give way to form Cornified layer

It reduces the loss of water by evaporation.

Malpighian layer

It is a layer of cells which actively divide to produce the epidermis

It contains a pigment called melanin which determines the color of the skin.

2. The dermis.
   This region is the inner layer of the skin and it stores fats under it.
   It contains the following parts
   - Capillaries
   - Sweat glands
   - Sweat duct
   - Hair follicle
   - Sebaceous glands
   - Sub cutaneous fat
   - Nerves

Note: Explain and allow the learners write the functions/ uses of the above identified parts

ACTIVITY:

1. Identify the main layers of the human skin.

2. Draw and label parts of the human skin

3. State the function/ use of each of the parts shown on your drawn skin

4. The epidermis is sub divided into other three layers. Identify these layers and tell what is found in each sub layer and the use (Ref Baroque integrated sci pupils BK 7 Pg 92)

LESSON 3

TOPIC: EXCRETORY SYSTEM

S.TOPIC FUNCTIONS OF THE HUMAN SKIN

Read and write.

- Excrete
- Regulate
- Protects
- Stores
- Manufacture etc

  Functions of the human skin
  - Excretes salts, water and some urea
  - Regulates body temperature
  - Stores fats
  - Makes vitamin D by the help of sun rays
  - Protects the body against germs and infections
  - It acts as a sense organ for feeling. (Ref- comprehensive sci pupils BK 7 Page 78-79 and Baroque pupils sci BK 7 Pg 92)

Body temperature control: (on hot times/ days)

- Blood vessel(s) widen(s) (vasolidate(s)) allowing more blood to flow near the surface and more heat is lost by radiation
- Sweat glands produce more sweat through which heat is lost by evaporation.
- Excretor muscles relax causing hair to lie flat on the body to allow wind easily sweep off heat.

On cold days:

- The blood vessels vasoconstrict(s) (narrow(s) and so blood is withdrawn from the surface limiting heat loss by radiation.
- Decrease in sweat is produced thus reducing heat loss by evaporation.
- Through shivering, heat is produced by contracting muscles
- Fats under the skin act as heat insulators
- Erector muscles contract causing hair to erect and trap air around the skin which acts as the insulator of heat loss.
- When hair erects, goose pimples appear on the skin.

ACTIVITY

1) State the general functions/ uses of the skin
2) Explain what happens within/ outside the skin during;
   a) Hot times/ days
   b) Cold times/ days

LESSON 4

TOPIC: EXCRETORY SYSTEM

S.TOPIC: DISEASES AND DISORDERS OF THE HUMAN SKIN

Read and write

- Disorder
- Disease
- Fungal
- Bacterial
- Viral

Diseases of the human skin

The skin diseases are put in groups according to their causes namely;

- Fungal skin diseases- caused by fungi
- Bacterial disease- caused by bacteria
- Viral diseases- caused by virus
- Parasitic diseases- caused by protozoa

Examples of fungal skin diseases

- Ringworms
- Athlete's foot

Bacterial skin diseases

- Abscers/ Boils
- Leprosy
- Impetigo

Viral skin diseases

- Chicken pox
- Herpes zoster
- Warts

Parasitic skin diseases

- Scabies

Disorders of the skin

- Burns and scalds
- Skin allergy
- Wounds
- Skin rash

- Bruises etc

Note: Teach about spread, signs and symptoms and prevention of skin diseases.

ACTIVITY

1) State and explain the examples of skin diseases according to their causes
2) Identify the signs and symptoms of the above identified skin diseases
3) Name any four disorders of the human skin.

LESSON 5

TOPIC: EXCRETORY SYSTEM

S.TOPIC: CARE FOR THE SKIN AND TOOLS/ ITEMS USED TO CLEAN THE SKIN

Rea and write

- Daily
- Regularly
- Care
- Clean

Ways of caring for the skin

- Bathe daily with warm clean water and soap
- Rub your body with a towel after bathing
- Wounds and cuts should be well covered with sterilized bandage
- Do exercises daily to keep it in good working conditions
- Eat a balanced diet to allow proper functioning of the skin

Tools/ items/ materials used in caring/ cleaning the skin

- Towel
- Soap
- Sponge
- Clean water

ACTIVITY

1) Name at least four tools used in cleaning the skin
2) Identify any two ways of caring for the skin

TOPIC 6

TOPIC: EXCRETORY SYSTEM

S.TOPIC: THE URINARY SYSTEM

Read and write

- Eliminate
- Waste
- Filter

Urinary system

This system is made up of organs that eliminate wastes from the body inform of urine.

Organs of the urinary system

- Kidney
- Ureter
- Urinary bladder
- Urethra

The structure of the urinary system (Ref. comprehensive primary school science BK 7 Pg 76 by Mukisa Rasuuli, Baroque integrated science pupils BK 7 Pg 97)

Cross- sectional structure of the kidney. (Ref Baroque integrated science pupils BK 7 Pg 97)

Functions of the parts of the human kidney

1) Renal artery: supplies oxygenated blood to the kidney
2) Renal vein: takes deoxygenated blood from the kidney to the venacava
3) Cortex: blood is filtered to remove urea, uric acids, excess salts and water
4) Medulla: its where selective re-absorption takes place by the nephrones
5) Pelvis: its where urine is collected from numerous nephrones
6) Urethra: it's a passage of urine to the urinary bladder
7) Urinary bladder: its an elastic and muscular sack that stores urine temporarily

ACTIVITY

1) Define a urinary system
2) Identify the major organs of the urinary system
3) Draw the structure of the human kidney and label its parts
4) State the function of each part shown on the human kidney
5) Name the parts of the human kidney where the following processes take place:
    a. Selective re-absorption
    b. Filtration of blood

LESSON 7

TOIC: EXCRETORY SYSTEM

S.TOPIC: GENERAL FUCTIONS OF THE HUMAN KIDNEY AND WASTE PRODUCTS EXCRETED

Read and write

- Excess
- Waste product
- Excreta
- Regulate
- Filter
- Remove
- Controls

Functions/ uses of the human kidney

- Filters blood
- Regulates amount of water in blood
- Controls the level of salt in blood
- Removes nitrogenous wastes from the body
- Produces the hormone which is important in production of red blood cells(RBCs)

NOTE: People tend to urinate a lot during cold days because the rate of sweating is low and therefore the only way to remove excess water and excess mineral salts is by urinating.

Waste products excreted by the kidney

- Uric acid
- Urea
- Excess salts
- Excess water

ACTIVITY

1) State the functions of the kidney in the human body
2) Name the waste products which are excreted from the body bt the kidney
3) Why do people tend to urinate a lot on cold days than on hot days?

LESSON 8

TOPIC: EXCRETORY SYSTEM

S.TOPIC: DISEASES AND SISORDERS OF THE HUMAN KIDNEY/ WAYS OF CARING FOR THE KIDNEY

Read and write

- Failure
- Control
- Treatment

Diseases of the human kidneys

- Cancer of the kidney
- Kidney failure
- Kidney
- Cystitis

Ways of caring for the kidney

- Eat food containing a balanced diet
- Drink water regularly
- Avoid stress
- Keep the body weight in check
- Eat food containing less salt
- Go for regular kidney and body check up
- Take regular excises
- Avoid drug abuse and misuse
- Do not hold urine for a long time

ACTIVITY

1) Identify some of the ways through which the kidney can be cared for
2) State the diseases that affect the human kidney
3) How do we call the condition by which the kidneys fail to remove urea from blood?

LESSON 9

TOPIC: EXCRETORY SYSTEM

S.TOPIC: THE LIVER AS AN EXCRETORY SYSTEM

Read and write

- Poisonous
- Detoxication
- Emulsify
- Regulate

THE LIVER

- The liver is said to be the most important organ in the body because it performs many functions compared to other body organs
- The liver is a large reddish brown organ below the diaphragm
- It's supplied with oxygenated blood by the hepatic artery and receives blood rich in digested food from the alimentary canal through the hepatic portal vein

Functions of the liver

- The liver regulates blood sugar
- It helps in excretion of bile pigment
- Stores vitamins and mineral salts
- It helps in detoxicating process
- It produces heat energy within the body
- It helps in the use of fats by converting them into glucose hat is needed by the body

Diseases of the liver (Ref comp primary science pupils BK 7 Pg 81 by Mukisa Rasuuli)

ACTIVITY

1) Briefly describe what a liver is
2) Identify the functions of the liver in relation to excretion
3) How is the bile pigment produced by the liver important in the human body?
4) Name the organ that;
    a. Produces the bile
    b. Stores the bile

5) Identify ways of caring for the liver

6) Identify any two diseases that affect the liver

LESSON 10

TOPIC: EXCRETORY SYSTEM

S.TOPIC: THE LUNGS AS EXCRETORY ORGANS

Read and write

- Carbon dioxide
- Air sac
- Respiration
- Exchange
- Gaseous exchange

THE LUNGS

- The lungs act as both respiratory and excretory organs
- They are respiratory organs because they allow oxygen in the body for the process of respiration
- They are also called excretory organs for they help to liberate carbon dioxide, water vapor which are waste products of respiration
- Its in the lungs where gaseous exchange takes place in the body in the air sacs(Alveoli)

ACTIVITY

1. State the excretory function of the lungs
2. State the structure in lungs where gaseous exchange occurs
3. Name the waste products of the body that are excreted by the lungs

LESSON 11

TOPIC: LIGHT ENERGY

S.TOPIC: LIGHT AS FORM OF ENERGY

Read and write

- Natural
- Artificial
- Energy
- Object
- Source

ENERGY

Is anything that enables man to do work

Forms of energy examples

- Light energy
- Sound energy
- Electricity
- Heat energy

- Chemical energy
- Mechanical energy
- Solar energy
- Magnetism

LIGHT ENERGY

Light is the form of energy which enables our eyes to see objects

OR Light is the form of energy which stimulates the sense of seeing

How we see objects with our eyes using light

ACTIVITY

1. Define the following key terms as used under light
   Energy
   Light energy
2. Describe how we are able to see
3. State the types of sources of light
4. Identify examples in each type of source of light identified above

LESSON 12

TOPIC: LIGHT ENERGY

S.TOPIC: LUMINOUS AND NON-LUMINOUS OBJECTS

Read and write

- Luminous
- No-luminous
- Incandescent
- Emit

Luminous objects/ luminous sources of light

These are sources of light which emit (send) or produce their own light. (they are also called direct sources of light)

Examples

- The sun
- The stars
- Red hot charcoal
- Fire flies

- Hands and fingers of some clocks and watches
- Some kinds of rocks
- Bulbs
- Erupting volcanoes
  NB: Among luminous sources of light, some give us light when they are red hot. These are called incandescents e.g. Sun, Stars, hot filament of bulb, hot charcoal

- We see objects when they reflect light into our eyes
- Light travels from the objects to our eyes
- Some objects give out their own light while others reflect light falling on them from other sources

Sources of light

- Natural sources of light
- Artificial sources of light

Natural sources of light

These are sources of light which exist naturally

Examples

- The sun
- Stars
- Erupting volcanoes
- Glow worms
- Fire flies
- Lightning

Artificial sources of light

These are sources of light which are made and controlled by man

Examples

- Electric bulb
- Torches
- Lamps (pressure lamps)
- Candles
- Fires
- Charcoal stove
- Functioning phone

- Lanterns
- Etc

Non- luminous objects/ sources of light

These are sources of light which do not emit their own light but just reflect light from other sources

Examples

- The moon
- The planets
- The plane mirrors

ACTIVITY

1. Define;
   Luminous objects of light
   Non-luminous objects of light
2. Identify examples of both luminous and non-luminous sources of light
3. Why is the moon not considered as the source of light?

LESSON 13

TOPIC: LIGHT ENERGY

S.TOPIC: IMPORTANCE OF LIGHT IN THE ENVIRONMENT

Read and write

- Sunlight
- Photosynthesis
- Hatch

Importance of light in the environment

- Light enables us to see objects
- Its used by plants to carry put photosynthesis
- Heat and light from the sun help the eggs of reptiles, amphibians and fish to hatch
- Our bodies use sunlight to make vitamin D
- Sunlight energy can be trapped and transformed into electric energy etc

ACTIVITY

1. How useful is the sunlight to plants?

2. How do reptiles, amphibians and fish make use of heat and light from the sun in their reproduction?
3. Identify the general importance of the light in the environment

LESSON 14

TOPIC: LIGHT ENERGY

S.TOPIC: TRANSMISSION OF LIGHT

Read and write

- Care board
- Travel
- Transmission
- Source
- Move

Transmission of light

Light travels in a straight line or straight lines to all directions from the source

Illustration of how light travels: (Baroque integrated science pupils BK 7 Pg 112)

- As a teacher ensure description about the illustration that shows the transmission of light

NB: We hear sound around corners because sound travels in waves but we cant see around corners because light travels in a straight line

ACTIVITY

1. How does light travel from the source
2. In the space, draw an illustration which shows that light in straight line from the source
3. Why are we not able to see around corners?

LESSON 15

TOPIC: LIGHT ENERGY

S.TOPIC: RAYS AND BEAMS OF LIGHT

Read and write

- Ray
- Beam
- Path
- Parallel
- Diverge
- Converge

Rays and beams of light

A ray of light: Is a line along which light travels

OR A ray is a path of light.

Representation of a ray of light

A beam of light

A beam of light is a group of light rays

OR a beam is a stream of light energy

Types of beams of light

There are three types of beams;

1) Parallel beams
2) Diverging beams
3) Converging beams

Illustrations of the types of beams and their definitions (Ref: Baroque sci pupils BK 7 Pg 114; Baroque teachers guide BK 7Pg 105)

ACTIVITY

1. Define the following terms as used under travel of light
    a) A ray of light
    b) A beam of light
    c) Parallel beams
    d) Diverging beam
    e) Converging beam
2. Illustrate the following in the space provided below
    a) A ray
    b) A beam of light called diverging beam
    c) A beam of light called converging beam
    d) A beam of light called parallel beam

LESSON 16

TOPIC: LIGHT ENERGY

S.TOPIC: EFFECTS OF DIFFERENT MATERIALS ON LIGHT AND SPEED OF LIGHT

Read and write

- Transparent
- Translucent
- Opaque
- Vacuum
- Tinted

Speed of light

The speed of light is about 300000 km/s in air and vacuum

Light travels faster than sound in air

Examples to prove that light travels faster than sound

- We hear thunder after we have seen lightning
- At a race track, we see the flash of starter's gun before we hear the bang
- The sound of an axe is heard after we have seen the axe strike when cutting

Effects of different materials on light

When light meets an object, one of he following will happen;

- Light can be absorbed, diffused or scattered.
- Light may be allowed through transmission

Materials which affect light are grouped into three

i. Transparent objects
ii. Translucent objects
iii. Opaque objects

Transparent objects

These are objects which allow most of the light to pass through and we can see through them clearly.

Examples of transparent objects

- Glass
- Water
- Air

Translucent objects

- These are objects which allow some light to pass through but we cannot see through them clearly.
- We cannot see through them because they diffuse or scatter light rays in all directions

Examples of translucent objects

- Frosted glass
- Waxed paper
- Tissue paper
- Cloth
- Light bulbs

Opaque objects

- These are objects which do not allow any light to pass through them.
- We cannot see through them because opaque objects absorb all light rays and form shadows.
- Opaque objects instead form shadows.

Examples of opaque objects

- Wood
- Stone
- Metals
- Walls
- Block

ACTIVITY

1) Define the following terms
    i. Transparent materials
    ii. Translucent materials
    iii. Opaque materials
2) Discuss what happens to light rays when they meet the above objects.
3) Explain how shadow is formed.

LESSON 17

TOPIC: LIGHT ENERGY

S.TOPIC: SHADOWS AND ECLIPSE

Read and write

- Shadow
- Eclipse
- Orbit
- Penumbra
- Umbra

Formation of shadows

- A shadow is region of darkness caused by obstruction of light by an opaque object.

Types of shadows

- Umbra
- Penumbra
- When the source of light is a small point, a sharp complete shadow is formed called a total shadow/ umbra
- When the source of light is big, a total shadow called umbra is surrounded by half or partial shadow called penumbra.

Eclipse

An eclipse is a shadow formed by the obstruction of light by either the moon or earth

The word eclipse means “cut off”

Note; the sun is stationery

The earth revolves round the sun on its fixed path called orbit.

The moon revolves round the earth but its orbit is not fixed.

Eclipse of the sun- solar eclipse

- It occurs when the moon comes in between the sun and the earth.
- When this happens the sun casts the shadow of the moon onto the earth.

Illustration of the eclipse of the sun (solar eclipse) (Ref Baroque int. sci BK 7 Pg 121)

Annular eclipse of the sun

- It occurs in the same way as the solar eclipse. But when the moon is far away from the earth and the umbra fails to reach the earth.
- When this happens the earth only receives the penumbra and the sun will be encircled by a ring.

An illustration in Baroque int. sci BK 7 Pg 121

Eclipse of the moon- Lunar eclipse

- The eclipse of the moon occurs when the earth comes in between the sun and the moon.
- This happens only when there is a full moon.
- The moon is in total eclipse, so it doesn't reflect any light.

An illustration of the eclipse of the moon (Ref Baroque int. sci p/s BK 7 Pg 121

ACTIVITY

1) What name is given to the eclipse of;
   The sun
   The moon
2) How are shadows formed?
3) Name the region of the shadow that;
   Gets total eclipse
   Gets partial eclipse

4) State any two characteristics of shadows.

LESSON 18

TOPIC: LIGHT ENERGY

S.TOPIC: REFLECTION OF LIGHT

Read and write

- Reflection
- Regular
- Irregular
- Diffuse

Reflection of light

Reflection is the bouncing back of light rays when they strike a shining opaque object.

Types of reflection

There are two types of reflection

Regular reflection

- It is the type of reflection where the beam of light is sent back in a defined direction.
- It is produced when light falls on a smooth shining surface e.g. mirrors
- We are able to view ourselves in plane mirrors because they are highly polished and give a regular reflection

(An illustration in Baroque int. sci p/s BK 7 Pg 125, comprehensive pri sci Pg 95-96)

Irregular reflection

- It is the type of reflection where the beam is scattered and thrown back in all directions
- Rough unpolished surfaces give irregular reflection/ diffuse reflection.
- We are unable to see clear images on walls because they give irregular reflection

(Illustration of irregular reflection in Baroque int. sci p/s BK 7 Pg 125

Reflection principle and its laws

ON- Normal ray

AO- Incident ray

OB- Reflected ray

i- Angle of incidence

r- Angle of reflection

o- Point of incidence

g- Glancing angle

The laws of reflection

- The incident ray, the reflected ray, the normal and the point of incidence all lie in the same plane.
- The angle of incidence is equal to the angle of reflection.

QN: The incident ray makes an angle of 60 to the mirror. What is the value of the angle of reflection?

ACTIVITY

1) Give the meaning of reflection.
2) In the space, draw the diagram showing
   Regular reflection
   Irregular reflection
3) State the law of reflection
4) How is the angle of incidence related to the angle of reflection?

LESSON 19

TOPIC: LIGHT ENERGY

S.TOPIC: SIMPLE CALCULATIONS UNDER REFLECTION OF LIGHT

Read and write

- Incident ray
- Reflected ray
- Perpendicular

Simple calculations

Find he value of angle a

The normal makes 90 to the mirror

40+a=90

40-40+a=90-40

a=50

(Ref Baroque int sci pupil's BK 7 Pg 126 and 127)

ACTIVITY

1) In the diagram below about reflection,
   Name the ray marked K
   Find the value of angle M

2) Study the diagram below and answer the questions about it.

a) Complete the diagram by missing ray
b) Name NOR

LESSON 20

TOPIC: LIGHT ENERGY

S.TOPIC: IMAGES AND OBJECTS

Read and write

- Image
- Plane mirrors
- Erect
- Inverted

- Virtual

Images and objects

An image is a light picture

Types of images

i. Real images
ii. Virtual images

Characteristics of images formed by plane mirrors

- The distance of the object from the mirror is the same as the distance of image behind the mirror
- The image is laterally inverted
- The image is the same size as the object
- The image is always upright/ erect
- The image is virtual i.e. cannot be cast on the screen

Uses of plane mirrors

- They are used to see certain parts of the body that we cannot see directly
- They are used in periscopes

  A periscope is an instrument which is used to see around corners by soldiers in trenches and in submarines

ACTIVITY

1) Define an image
2) State the characteristics of images formed by plane mirrors
3) Suggest any two uses of plane mirrors in day to day life.

LESSON 21

TOPIC: LIGHT ENERGY

S.TOPIC: THE PERISCOPE

Read and write

- Mirror
- Instrument
- Submarine
- Device

Uses of periscope

- A periscope is a device that uses laws of reflection to work.
- A periscope is used to see things behind big walls or under water to see what is happening on the surface of water.
- Periscopes are used by submarines to see without exposing themselves to the enemy
- They are used to see around corners.

Uses of reflection in the environment

- We are able to see ourselves in mirrors due to reflection e.g. dressing, bathing, combing hair.
- We are able to see things in the environment.
  The structure of a periscope (Baroque int. sci p/s BK 7 Pg 130)

ACTIVITY

1) Outline the importance of reflection in the environment.
2) State the uses of a periscope.
3) Mention any two groups of people who use periscopes

LESSON 22

TOPIC: LIGHT ENERGY

S.TOPIC: MIRRORS- CURVRD MIRRORS

Read and write

- Curved
- Concave
- Convex

Curved mirrors

These are mirrors which are sphere like in shape.

They obey the laws of reflection.

Types of curved mirrors

i. Concave mirrors
ii. Convex mirrors

Concave mirror/ converging mirrors

Characteristics of images formed by concave mirrors

- The image is larger than the object
- They are erect/ upright
- They are laterally inverted
- They are virtual(formed behind the mirror) so they cannot be cast on the screen

A beam of light on the concave mirrors

Uses of concave mirrors

- They are used by barbers as shaving mirrors
- They are used by dentists
- They are used in head lamps
- They are used in telescopes

Convex mirrors (Diverging mirrors)

They are made by silvering the inside of the sphere

(Illustration on page 101 comprehensive sci)

Characteristics of images formed by convex mirrors

- The image is smaller than the object(diminished)
- The image is upright- erect
- The image is laterally inverted
- The image is virtual- behind the mirror

A beam of light on a convex mirror

(An illustration in comp sci BK Pg 102)

Uses of convex mirrors

- They are used in driving mirrors of vehicles
- They form upright images

- They give a wide view of distant objects
- They are used in supermarkets to see what customers do
- Security mirrors in bus and cars

ACTIVITY

1) List down any two types of mirrors
2) Suggest the characteristics of images formed by concave mirrors
3) Suggest the characteristics of images formed by convex mirrors
4) State the uses of concave and convex mirrors

LESSON 23

TOPIC: LIGHT ENERGY

S.TOPIC: REFRACTION OF LIGHT AND LAW OF REFRACTION

Read and write

- Refraction
- Real
- Apparent depth
- Bending
- Density
- Transparent

Refraction of light

Refraction is the bending of light as it passes from one transparent medium to another.

E.g.

- From air to gas
- From air to water
- From glass to water

Refraction is caused by change in speed of light as it passes from one transparent medium into another which has different density.

BO is the ray of incidence it is in air

O is the boundary and point of refraction

NOR is the normal

I is the angle of incidence

r is the angle of refraction

OC is the refracted ray. It is in water

NB: When a ray of light passes from less dense medium to a more optically dense medium the ray bends towards the normal.

When the ray of light moves from a more dense medium to a less dense medium, it bends away from the normal.

<u>The law of refraction</u>

- The incident ray, the refracted ray is on opposite side of the normal.
- The incident ray, the refracted ray and the normal all lie in the same plane.

<u>Refraction of light through a rectangular glass prism</u>

IR is the incident ray. It is in air

RR is the refracted ray. It is within the glass

ERR is the emergent refracted ray. It is in air

I is the angle of incidence

r is the angle of refraction

Effects of refraction

- A swimming pool appears shallower than its real depth because of refraction. This is seen by placing a stone in a glass and they view it from the top.
  (An illustration: comp sci BK 7 Pg 103
- A ruler or a stick partly dipped at an angle into some water in a glass appears bent or broken due to refraction.
- Refracted stick fixed vertically and partially dipped in water appears to be shorter than its real length.
- A mirage is an optical illusion caused by the bending of light rays due to layers of air having different densities and temperature.

Effects of mirages

- Mirages may lead to accidents on high ways.
- Mirages cause false images along high ways.

ACTIVITY

1. Define refraction of light
2. State the law of refraction
3. Mention the effects of refraction
4. Suggest one way refraction of light affects the fisherman's work.
5. How is reflection different from refraction?

LESSON 24

TOPIC: LIGHT ENERGY

S.TOPIC: LENSES AND OPTICAL INSTRUMENT

Read and write

- Lens

- Convex
- Concave
- Diverge
- Converge

LENSES AND OPTICAL INSTRUMENTS

A lens: Is a transparent material with curved sides capable of refracting light.

Types of lenses

There are two types of lenses

- Convex lens(converging lens)
- Concave lens(diverging lens)

Illustrations of both concave and convex lens (Baroque integrated sci pupils BK7 PG 136)

Uses of lenses

- Lenses are used in optical instruments e.g. microscope, telescopes, magnifying glasses
- The human eye also uses a lens

Optical instruments

What are optical instruments? These are instruments which use either a lens, prism, plane mirror or curved mirrors

Examples of optical instruments

- Cameras
- Microscope
- Spectacles
- Magnifying glasses
- Telescopes
- Binoculars
- Projectors
- Etc

Effects of lenses on beams of light

The effect of lenses on beams of light is determined by the type of lens. E.g.

Convex lens: When a beam of light meets the convex lens, it's bent towards the principal axis and we say a beam has converged

Concave lens: When a beam of light meets the concave lens, the beam of light will diverge away from the principal axis

ACTIVITY

1. Define a lens
2. Name the two types of lenses
3. Using an illustration, show both a concave and convex lens
4. State the uses of lenses in our daily life
5. What is an optical instrument?
6. Identify nay three examples of optical instruments.

LESSON 25

TOPIC: LIGHT ENERGY

S.TOPIC: DISPERSION OF LIGHT

Read and write

- Dispersion
- Split
- Refraction
- Spectrum
- Rainbow

Dispersion of light

- Dispersion of light is the splitting of white light into the seven colours of the spectrum
- A spectrum is a band of seven distinct colours.
- A spectrum is formed when white light is split by the act of a prism.
- A prism is a device that splits white light into seven distinct colours(ROYGBIV)
- An example of a natural light spectrum is a rainbow
- Dispersion of light is due to refraction of light.

Colours of the spectrum

(An illustration: Baroque int. sci. p/s BK7 Pg 133)

Primary colours and secondary colours

- A primary colour is one that cannot be obtained by mixing other colours eg red, blue and green
- A secondary colour is a colour made by mixing two primary colours eg yellow, magenta, peacock

How to make secondary colours

- Red+ green=yellow
- Red+ magenta=white
- Blue+ yellow=cyan or peacock blue

ACTIVITY

1. Define the dispersion of light
2. What causes the dispersion of light?
3. Name the natural spectrum in nature
4. Name the most and least refracted colours of the spectrum
    I. Most refracted
    II. Least refracted
5. Mention the types of;

I. Primary colours
II. Secondary colours

LESSON 26

TOPIC: LIGHT ENERGY

S.TOPIC: THE PINHOLE CAMERA

Read and write

- Pinhole
- Diminished
- Inverted
- Real
- Image

A PINHOLE CAMERA

- A pinhole camera works on principal that light travels in a straight line
- This is why inverted images are formed on the screen

The structure of a pinhole camera (Ref: Baroque integrated sci p/s BK7 Pg 138) and comprehensive sci pupils BK7 Pg 106 by Rasuuli Mukisa)

Parts of a pinhole camera and their functions

a) The shutter- keeps out light when it's not needed
b) Diaphragm- controls the amount of light entering the aperture

c) Aperture- acts as entrance of light into the camera
d) Convex lens- converges the light rays to focus images on the retina
e) Film- it's where images are formed in a camera

Characteristics of images formed by lens camera

- The images are real
- The images are inverted (upside down)
- The images are diminishes(smaller than object)

Note: The size of the image formed is determined by the distance between the camera and the object

ACTIVITY

1. On which principal does a pinhole camera work?
2. Draw and name parts of a pinhole camera
3. Identify the functions of the parts of a pinhole camera
4. State the characteristics of images formed by a pinhole camera
5. What determines the size of the Image formed by pinhole camera?

LESSON 27

TOPIC: LIGHT ENERGY

S.TOPIC: THE LENS CAMERA (PHOTOGRAPHIC CAMERA)

Read and write

- Optical
- Diaphragm
- Film
- Focus
- Shutter

The lens camera (photographic camera)

The structure of a lens camera (Ref Baroque integrated sci. pupils BK7 Pg 138

Note: Show the parts of the lens camera

Parts and their functions

1. Film: it's a light sensitive part on which inverted images are formed.
2. Diaphragm: it regulates the amount of light that has been allowed into the lens
3. The lens: it focuses the image on the film. The film works as a screen.

4. The shutter: it uncovers the aperture for a fraction of a second thus admitting light into the camera. By doing this, the film is exposed to light.
5. Focusing ring: this adjusts the distance of the lens from the film.(it moves the lens either forward or backward)

Characteristics of images formed by a lens camera

- The images are diminished (smaller than the object)
- The images are real or they are cast on the screen/film
- The images are inverted(upside down)

How a camera works (Ref comprehensive science pupils BK7 Pg 106 by Rasuuli Mukisa)

ACTIVITY

1. Draw and label the parts of the lens camera
2. State the functions of the parts shown on the lens camera
3. Identify the characteristics of images formed by a camera
4. Briefly explain how a lens camera works

Regulation of the size of pupil

Ref to comprehensive science pupils BK7 Pg 109

6. Pupil: admits light into the eye

7. Cornea: it helps in refracting and converging light

   It's transparent and curved in nature

8. Retina: it's the part of the eye where the images are formed

   It's the part of the eye that can be compared to the film in the camera.

9. Lens: it also refracts light and focuses the image on the retina

10. Eye lashes: they form a net in front of the eye which helps to trap air borne particles.

11. Optic nerve: it transports the nerve impulses or nerve signals to the brain for interpretation.

12. Tear glands: these are glands which lie under the top eyelid.

    They secrete a solution containing;

    - Sodium
    - Hydrogen carbonate

- Sodium chloride

These glands have an enzyme which destroys and kills some bacteria

LESSON 28

TOPIC: LIGHT ENERGY

S.TOPIC: THE HUMAN EYE

Read and write

- Iris
- Retina
- Optic
- Nerve
- Pupil

The human eye

The structure of the human eye (Ref Baroque integrated sci pupils BK7 Pg 140)

Note: include also the font view of the eye

Parts of the human eye and their function

1. Conjunctiva
    - Is a thin layer which lies inside the eyelid
    - It is kept most and clean by slow continuous stream of liquid from the tear glands
2. Eyelids
    - They cover and protect the eye
    - Blinking of eyelids can be voluntary and reflex action
    - Blinking helps to distribute a fluid (tears) over the surface of the eye to prevent it from drying
    - Tears clean up the eye and kill some germs which enter the eye.
3. Sclerotic
    - It's tough non elastic coat around the eyeball
    - It supports and maintains the shape of the eyeball
4. Choroid
    - It has a network of blood capillaries supplying food and oxygen to the eye.
    - It's a pigmented black to reduce internal reflection of light with in the eye.
5. Iris
    - It regulates the size of pupil and controls the amount of light entering the eye.
    - It determines the colour of the eye.

6. Suspensory ligament
    - Holds the eye lens in position by attaching it to the cillary body.

ACTIVITY

1. Draw and label the parts of the human eye.
2. State the function of each part of the human eye.
3. Which part of the human eye can be compared to the film part of the camera?
4. Name the part of the human eye which sends the nerve signals to the brain for interpretation.

LESSON 29

TOPIC: LIGHT ENERGY

S.TOPIC: CHARACTERISTICS OF IMAGES FORMED BY THE EYE

SIMILARITIES AND DIFFERENCES BETWEEN THE EYE AND CAMERA

Read and write

- Upside
- Diminish
- Real
- Focus
- Inverted

Characteristics of images formed by the eye

- The images are real
- The images are inverted
- The images are diminished

Similarities between the images formed by the eye and the camera

The human eye	The lens camera
➢ Image falls on the light sensitive retina	➢ Image falls on the light sensitive film
➢ Has a convex lens ➢ It is covered by a black layer choroid ➢ Iris controls the amount of light by regulating the size of the pupil	➢ Has a convex lens ➢ It is covered by a light proof box ➢ The diaphragm controls the amount of light by regulating the size of the aperture
➢ The image is real, inverted and diminished	➢ The image is real, inverted
➢ The cillary muscles determine the	➢ The focusing ring determines the

accommodation of the lens	distance of the lens from the film
➢ The eyelids keep out light	➢ The shutter keeps out light

Differences between the eye and the lens camera

The eye	The camera
Iris controls the amount of light entering the eye	Diaphragm controls the amount of light entering the aperture
Eyelid keeps out light	Shutter keeps out light
Image formed on the retina	Image formed on the screen
Lens is soft and elastic	Lens is hard glass
Distance between the lens and retina is fixed	The distance between the lens and the film changes
Thickness of the lens changes	Thickness of the lens does not change

ACTIVITY

1. Write down the characteristics of images formed by the human eye
2. State the similarities between the images formed by the eye and the lens camera
3. State the differences between the images formed by the eye and the lens camera
4. In which way does the function of the retina in a human eye similar to thsat of the film in a lens camera?
5. Which part of the human eye is compared to the shutter of a lens camera in terms of functions?

LESSON 30

TOPIC: LIGHT ENERGY

S.TOPIC: EYE DEFECTS AND THEIR CORRECTION

Read and write

- Defect
- Correction
- Spectacles
- Focus

- Converge
- Diverge

Eye defects and how to correct them

An eye defect is the inability for an eye to focus certain distances normally

Causes

- The eyeball being too long or eye lens being too thick. This causes the image from distant objects be brought to focus in front of the retina
- Eye strain
- Abnormal shape of the eyeball
- Abnormal shape of the lens
- Colour blindness

Examples of eye defects

There are four types of eye defects common in humans;

a) Short sightedness(myopia)
b) Long sightedness(hypermetropia)
c) Old age sight(presbyopia)
d) Astigmatism

Short sightedness

A short sightedness is a condition when a person can only see near by objects clearly but cannot see distant objects

This occurs when the eye ball is longer than the normal or when the lens is too thick and the objects close to the eye can be focused properly but the point of focus for distant objects is in front of the retina

Normal eye sight

Both near and distant objects can be focused on the yellow spot on the retina

Correction of short sightedness

Short sightedness is corrected by wearing spectacles with diverging lens (concave lenses

N.B: Reference for diagrams is Baroque int. sci. BK7 Pg 143, teachers copy Pg 127

Long sightedness

Long sight is a condition when certain people can see distant objects clearly but cannot see near by objects

The main cause:

- Small or short eye ball or to thin eye lens
- The above causes the image from close objects be brought to focus behind the retina
- Illustration

This occurs when the eye ball is shorter than normal or when the lens is too thin. Distant objects can be focused properly but the point of focus for close objects is behind the retina

Correction of long sightedness

Illustration for all diagrams Baroque int. sci BK7 Pg 144

Long sightedness is corrected by wearing spectacles with convex lens/ converging lens

Old age sight

When the lens loses its elasticity it can no longer change in shape

It becomes suitable for only distant vision (long sight. Old age sight people usually require reading glasses which have converging lenses. This happens in old age above 60 years.

Astigmatism

- It's the most common of all eye defects.
- It is ca
- Used by the surface of the cornea not being perfectly smooth or spherical.
- Astigmatism is corrected by wearing spectacles with cylindrical lenses.

ACTIVITY

1. Name any two types of eye defects
2. State the major cause for each of the following eye defects
    I. Long sightedness
    II. Short sightedness
3. How can each of the following eye defects be corrected
    I. Long sightedness
    II. Short sightedness
4. Below is an eye defect. Draw its correction

    a) Name the lens used to correct the above eye defect

LESSON 31

TOPIC: LIGHT ENERGY

S.TOPIC: DISEASES IOF THE EYE, SIGNS AND SYMPTOMS, CAUSES AND PREVENTION

Read and write

- Chlamydia
- Swelling
- Blindness
- Flies

- Iritis
- Sty
- Ulcer

Diseases of the eye, causes, signs and symptoms and prevention

A disease is an illness to the body caused by germ as a condition that is un normal

Eye diseases

1. Conjunctivitis
   This causes the swelling of the conjunctiva
   Types of conjunctiva
   Acute conjunctivitis } caused by either virus or bacteria
   Chronic conjunctivitis
   Gonorrheal conjunctivitis } caused by neisseria gonorrhea

   Signs and symptoms
   - The white part of the eye becomes pink
   - Watery discharge from the eyelid(the discharge contains mucus and pus)
   - Scratching and burning sensations in the eyelid
   - Looking at light causes pain

Spread

- By the house flies landing on the eyes of an infected person then later on a normal
- Sharing of towels with infected person
- Sharing of handkerchief with infected person

Prevention

- Wash your hands in the morning and evening with clean water and soap
- Don't shake hands with infected person whose eyes look infected
- Avoid sharing towels, basins and other materials with an infected person
- Use clean handkerchief when cleaning your eyes
- All sick people should seek medical treatment.

2. River blindness
   It is caused by tiny worms carried from one person to another by small hump-back flies called black flies or simulium flies.
   The worm is called onchocerca vulvulus
   Unlike mosquitoes, the simulium flies need fast flowing rivers where they lay their eggs.

Signs and symptoms

- Red watery eyes
- Nodules under the skin specially on hips and legs
- Severe body itching
- Tough rough skin

Prevention

- Control the vectors by spraying against the adult flies and its lavae
- Treatment of infected person at an early age.

Other diseases of the eyes

- Brepharitis
- Cataracts
- Corneal ulcers
- Glaucoma\iritis
- Sty

ACTIVITY

1. Identify the diseases of the human eye
2. State the cause, spread, signs and symptoms and prevention of the identified diseases.
3. Name the germ for the following eye diseases
    a) River blindness
    b) Gonorrheal conjunctivitis

LESSON 32

TOPIC: LIGTH ENERGY

S.TOPIC: CARE FOR THE EYES

Read and write

- Strain
- Expose
- Prints
- Welders
- Sunlight

Ways of caring for the eyes

- Don’t rub your eyes with dirty hands
- Don’t strain your eyes by reading;
  Small prints with too little or direct light

a) In moving vehicles
b) In wrong posture like in bed

- Don't expose your eyes to very bright light
- Always wash your eyes with clean water and soap early morning and evening
- Never look direct at the sun, it may spoil the eyes
- When reading, use a correct distance of where you are reading from(at about 30cm)
- Don't share towels or clothes with people who have sick eyes.

ACTIVITY

1. State the importance of using soap in cleaning our face
2. Why are boda boda riders encouraged to put on helmets while riding?
3. What can one do to prevent direct sunlight from entering into the eyes?

LESSON 33

TOPIC: MATTER AND ENERGY

S.TOPIC: ELECTRICITY AND MAGNETISM

Read and write

- Flow
- Electrons
- Atom
- Unit

Matter

Is anything that occupies space and has weight

Properties of matter

- Matter occupies space
- Matter has weight
- Some matter expands on heat. Etc

States of matter

- Solids
- Liquids
- Gases

Energy

Is the ability to do work

Types of energy

- Kinetic energy
- Potential energy

Kinetic energy: is energy possessed by body in motion

Potential energy: is energy possessed by bodies/ body at rest or stationed

Forms of energy

- Sound energy
- Light energy
- Electric energy
- Heat energy
- Magnetism
- Mechanical energy
- Chemical energy

Electricity (electric energy)

It is the form of energy produced by flow of electrons

Electrons: are negatively charged particles of an atom.

An atom: an atom is the smallest possible unit of matter that's can take part in a chemical change.

Note: Atoms join together to form molecules

Uses of electricity

Used in;

- Lighting
- Cooking
- Operating machines
- Heating etc

Advantages of using electricity

- It's quick or fast to use
- It's clean and has no smoke
- It's friendly to the environment

Disadvantages

- It can shock and kill people
- It can burn property

Types/forms of electricity

Static electricity

Current electricity

ACTIVITY

1. Identify the following terms as used under electricity
   Matter
   Energy
   Atom
   Electricity
   Electrons
2. State the advantages and disadvantages of using electricity
3. State the uses of electricity in our daily life
4. Identify the 2(two) types of electricity in nature
5. State the difference between potential energy and kinetic energy

LESSON 34

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : STATIC ELECTRICITY (EXAMPLES, ADVANTAGES AND DANGERS)

Read and Write

- Lightning
- Electrons
- Static
- Friction

Static electricity

This is the type of electricity where electrons do not flow.

Static electricity is produced by friction between insulators.

Lightning is an example of static electricity in nature.

Examples of static electricity.

- Lightning in nature
- Rubbing insulators against each other

Lightning and thunder

- Lightning is caused when clouds become heavily charged with static electricity by means of friction.
- This is when positively charged clouds rub against negatively charged clouds.
- When positively charged clouds meet negatively charged, a huge spark of light is seen and this is what we call lightning.
- During lightning the surrounding air becomes strongly heated, expands and contracts suddenly which causes a vibration that produces sound called thunder
- The continuous noise is due to the echoes.
- Lightning is seen before thunder is heard because light travels faster than sound in air.

Advantages of lightning in nature

- It converts atmospheric nitrogen into nitrates for plant to use.

Dangers caused by lightning

- It damages buildings
- It can cause fires.

ACTIVITY

1. State any one example of static electricity in nature

2. How is static electricity produced?

3. Why is lightning seen faster before hearing thunder?

4. How is lightning important to crop farmers?

LESSON 35

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : PREVENTION OF DANGERS CAUSED BY LIGHTNING AND CURRENT ELECTRICITY

Read and Write

- Install
- Conductor
- Electrons
- Strike

Prevention of dangers caused by lightning

- Install lightning conductors on tall buildings
- Avoid standing under tall trees during rain storm
- Avoid swimming in open water during rain.
- Always put on rubber shoes.

Current electricity

This is the type of electricity where electrons flow through a conductor.

Types of current electricity

- There are two types of current electricity
- Direct current electricity (DC)
- Alternating current electricity (AC)

Direct current electricity (DC)

This is the type of current electricity which flows in only one direction that is from the source to the appliance.

Sources of direct current

- Dry cells
- Simple and wet cells
- Accumulators

ACTIVITY

1. Write in full

i)AC

ii) DC

2. List down two types of current electricity

3. How are tall buildings protected from the dangers of lightning?

4. Give one way you can prevent yourself against lightning when it is raining.

LESSON 36

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : ALTERNATING CURRENT ELECTRICITY AND ITS SOURCES

Read and Write

- Fuel
- Coal
- Petrol
- Diesel
- Turbines
- Nuclear
- Transform

Alternating current electricity. Is the type of current electricity which in both directions ie. Forward and back ward.

Sources of alternating current electricity

1. Hydro electricity. This is electricity produced by the powerful flowing water.

- At a power station, kinetic energy of moving water turns turbines which are connected to generators that produce electricity.
- Hydroelectricity can also be produced by tides along coasts.

2. Thermal electricity

This is type of electricity produced by burning fuel, coal or oil which contains stored chemical energy.

3. Atomic energy
It is the type of electricity produced by burning atomic uranium mineral.

4. Solar electricity.
It is the type of electricity got from the sun
It is got by using solar cells which trap heat and light from the sun that are sent to solar batteries to produce electricity

5. Geo thermal electricity
It is type of electricity produced by steam from hot springs.

ACTIVITY

1. Name any three examples of alternating current electricity

2. Name the type of electricity produced by fast flowing water.

3. Why are solar panel painted black?

4. Name the mineral needed in the production of atomic energy.

LESSON 37

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : ELECTRIC CIRCUITS AND SYSMBOLS USED (ENERY CHANGES IN ELECTRIC CIRCUITS)

Read and Write

- Current
- Flow
- Terminals
- Complete

Electric circuits

An electric circuit is a complete path through which an electric current flows. Current is the flow of electrons.

A simple electric circuit (Diagram on page 27 Baroque pupils book 7.

Parts of an electric circuit and their uses

- Ammeter. Measures electric current in a circuit
- Conducting wires is a medium for conducting current from the source to the appliance.
- Switch. Completes or breaks the circuit at ones will.
- Fuse. Is a safety device which breaks the circuit in case of too much flow of current.
- Dry cell. Store chemical energy that is changed to electric energy when the circuit is complete.
- The bulb has the ability to charge electric energy to heat and light energy.

NB: In a simple electric circuit, electricity /current flows from the positive terminal to the negative terminal.

Electrons flow from the negative terminal to the positive terminal.

Illustrations of flow of electrons and current.

Symbols used in an electric circuit (Ref. Baroque integrated science book 7 pg 28.

- Cell
- Switch
- Fuse
- Light bulb
- Ammeter
- Voltmeter.

Energy changes in a circuit

- When the circuit is complete, chemical change in a dry cell is changed to electricity.
- In a bulb, electricity is changed to heat and then heat to light energy.

Types of a circuit

a)Parallel circuit. Is the one in which all positive terminals are connected by one conductor and all negative terminals are connected by one another.

b) Series circuit. Is one in which the positive terminal of one cell is connected to the negative terminal of another cell to form a battery.

ACTIVITY

1. What is an electric circuit?

2. State the importance of the following devices used on an electric circuit.

i) A switch
ii) A fuse
iii) Ammeter

3. How is the function of the switch different from that of a fuse?

LESSON 38

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : SHORT CIRCUITS, DANGERS AND PREVENTION

Read and Write

- Spark
- Resistance
- Naked
- Bare
- Contact

SHORT CIRCUITS

- A short circuit is a path of electricity with low resistance to electric pressure.
- Is a short path taken by electricity
- A path with low resistance to flow of current
- An illustration about a short circuit on Baroque pupils book 7 pg 30, Trs copy pg 38.

Dangers of short circuits

- Short circuit may cause fire that may destroy property.
- Short circuit lead to destruction of electric appliances.

How to prevent short circuits

- Installation or wiring in a house should only be done by experts.

ACTIVITY

1. What is a short circuit?

2. State any two causes of short circuits

3. Suggest any two dangers resulting from short circuits.

4. Suggest any one way of preventing short circuits.

LESSON 39

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : INSULATION AND CONDUCTORS

Read and Write

- Conductor
- Insulator
- Electric shock
- Appliance

Insulators
Are materials which do not allow electricity to flow through them.

Examples of insulators

- Rubber
- Glass
- Rubber
- Dry cloth
- Dry wood

Insulators protect users from electric shock /circuit.

Conductors
These are materials which allow electricity to flow through them.

Examples of liquid conductors /non metallic conductors

- Water
- Acids
- Alkalis
- Carbon
- Wet wool

Examples of metallic conductors of electricity

- Silver
- Copper
- Lead
- Iron
- Zinc
- Tungsten

Note:
i) Distilled water does not conduct electricity because it lacks mineral salts.

ii) Copper is commonly used because it is cheaper.

iii) Silver is not commonly used because it is expensive.

NB.
Application of conductors

- When cooking
- When ironing.

ACTIVITY

1. Give the meaning of insulators of electricity

2. Why is distilled water said to be poor conductors of electricity.

3. Give a reason why electric wires are mostly covered with rubber?

LESSON 40

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : LECTRIC CELLS (PRIMARY CELLS)

Read and Write

- Conductor
- Positive
- Negative

Eclectic cells (primary cells)

These are cells that cannot be recharged once they are used up.

Examples of primary cells

- Simple cells/wet cells
- Dry cells

Parts of a simple cell (diagram, Baroque comprehensive p/science pg 31.

Copper rod. It acts as a positive terminal

Zinc plate. It acts as a negative terminal.

Dilute sulphuric acid. It acts an electrolyte

An electrolyte is a liquid that allow electricity to pass through eg. Lemon juice, sulphuric acid, salt solution, water etc.

A simple cell is not efficient because of two factors.

i)Polarization

ii) Local action.

Polarization is when bubbles of hydrogen gas cover the copper rod stopping the flow of electrons.

Local action is when bubbles of hydrogen gas are seen coming off the zinc plate.

Disadvantages of simple cells.

- It is bulky
- Can only be used in upright position.
- Produces electricity for a short time

Dry cells. (diagram, Baroque integrate science pupils book 7 pg 25,comprehensive p/science by Mukisa Rasuli pg 33).

Parts of a dry cell and their functions

1. Brass cap. It is the positive terminal conductor of electricity in a dry cell.
2. Pitch or top seal. It prevents ammonium chloride jelly from drying up.
3. Ammonium chloride paste. It helps in the transfer of electrons.
4. Electrolyte. It is made up powered carbon and manganese oxide. The powered carbon provides a partial conductor across the inside of the cell and,
   -Reduces the work of the cell in moving electrons
   -Reduces the internal resistance of the cell.
   -Absorbs hydrogen

5. Carbon rod. It is the positive element and non-metallic conductor of electricity.

6. Zinc can. It acts as the negative element and its container in which the contents of the cells are put. A dry cell stores chemical energy and converts it to electric energy.

ACTIVITY

1. State the functions of the following parts of a dry cell

(a) Zinc can

(b) Brass cap

2. Which part of a dry cell is a non-metallic and good conductor of electricity

3. Name the part of a dry cell which acts as;

i) Positive terminal

ii) Negative terminal

LESSON 42

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : SECONDARY CELLS

Read and Write

- Rechargeable
- Storage
- Accumulator
- Mobile phone
- Brass

Secondary cells

These are cells which can be recharged once exhausted by passing electric current through them.

Examples of secondary cells

- Lead acid battery
- Telephone battery

Secondary cells store electric energy in chemical form

Secondary cells are also called storage cells or accumulators because they don't produce electricity of their own, they just store.

ACTIVITY

1. Write down two examples of secondary cells

2. Name any two devices which use secondary cells

3. Why are secondary cells called storage cells?

LESSON 43

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : AN ELECTRIC BULB

Read and Write

- Appliance
- Increase
- Resistance

An electric bulb
It is an electric appliance that charge electricity to heat and light energy

(Diagram of an electric bulb Ref. comprehensive primary science by Mukisa Rasuuli pg 35.

Parts of an electric bulb

i) Brass cap enables the bulb to be fixed in the lamp holder.
ii) Sealing tube-enables air to be removed from the bulb and this prevents the filament from combining with oxygen.
iii) Coiled filament. Changes electric energy to heat and then light energy. Filament is coiled to increase resistance to electric pressure. The filament is made up of tungsten which has a high melting point.
iv) Tungsten is got from a mineral called wolfram
v) Glass bulb holds a mixture of two gases. Argon and nitrogen

ACTIITY

1. Name two types of gases which occupy the glass envelope

2. Mention any two forms of energy produced by an electric bulb if the switch is closed.

3. Give the use of the following parts of an electric bulb

i) Coiled filament

ii) Brass cap

4. Why is the filament of an electric bulb coiled?

LESSON 44

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : AN ELECTRIC TORCH AND HOW IT WORKS

Read and Write

- Break
- Switch
- Fasten
- Convert

An electric torch and how it works
A torch uses dry cells. In most cases the dry cells are placed in series.
(Diagram of a torch, Baroque integrated science pupils book 7 pg 29)

The torch works on the principle that electricity travels in a complete circuit.
Uses of parts of a torch

- The switch –breaks and completes the circuit at one own will.
- The bulb- Changes electric energy into heat energy, electric energy into light energy and heat energy into light energy.
- The dry cells- change the stored chemical energy into electric energy
- The reflector directs light into a diverging beam.
- The cover and spring complete the circuit and also keep the cells tightly closed and firm.

However a torch can fail to work if the following take place

- When the bulb is not fixed properly
- When the dry calls are hot arranged properly
- When the cover is not fixed on properly.

If a torch starts working properly and later it stops working, then it means any of the following could have taken place.

The bulb could have blown
The dry cells could have become exhausted.

ACTIVITY

1. Name the energy changes that take place when the torch is in function.

2. How is the function of a switch similar to that of a cover and spring

3. List the factors that can lead a torch fail to work if the switch is pressed on.

LESSON 44

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : DEVICES CONNECTED TO ELECTRICITY

Read and Write

- Plug
- Dynamo
- Generator
- Produce

Devices connected to electricity

1. Generators. A generator produces electricity by changing mechanical energy in the form of kinetic energy to electric energy. This is done by rotating coils of wire in a strong magnetic field.

A generator can be made to produce more electricity by;

- Increasing the number of turns in the coil of wires.
- Increasing the magnetic field
- Increasing the speed of rotation.

2. Dynamos
A dynamo produce electricity by converting mechanical energy in the form of kinetic energy of a rotating coil into electric energy.
A small simple kind of dynamo is found on bicycles and bigger ones on vehicles. Those in vehicles help in recharging the batteries.
Diagram of a bicycle dynamo rf. Comprehensive primary science by Mukisa Rusuuli pg 39.

3. Electric motors
- Electric motors are the reverse of generator and dynamos.

Generators and dynamos use mechanical energy to produce electricity while motors use electricity energy to produce mechanical energy.

Motors are used to start engines of cars to move some buses, trains, lifts, fans vacuum cleaners, egg beaters etc.

ACTIVITY
1. Mention any two devices that change mechanical energy to electric energy.

2. How are motors different from generators in terms of energy produced?

3. Suggest two ways generators can be made to produce more electricity.

LESSON 47

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : SAFETY PRECAUTIONS IN HUNDLING ELECTRICITY

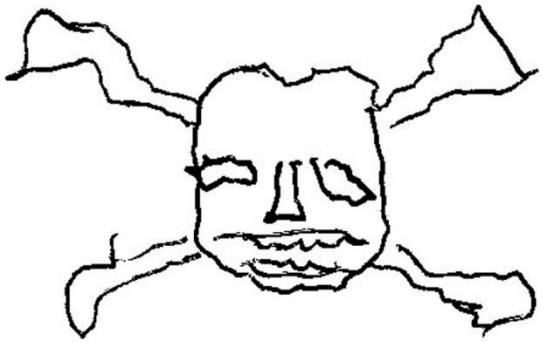
Read and Write

- Appliance
- Live
- Danger
- Shock

Safety precautions in handling electricity /electrical appliance

- Switch off electrical appliance in case of problem
- Do not touch live bare wires of electricity
- Never throw objects on main power line.
- Have all electric repair done by experts
- Never operate electrical appliance with wet hands
- Never push metallic objects into electric sockets

The illustration showing the danger caused by electricity



ACTIVITY

1.Why are we encouraged to put on gloves when handling repairs in electricity?

2. State any other 3 examples of insulators apart from rubber

3. Identify safety precautions in handling electricity.

LESSON 48

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : MAGNETS /MAGNETISM

Read and Write

- Force
- Able
- Push /pull
- Substance
- Piece

MAGNETS

A magnet is a piece of metal that has ability to push or pull (attract) magnetic substances

Magnetism
It is the force in the magnets that allows it to push /pull other magnetic substances.

Properties of magnets

- A freely suspended magnet faces North-South direction.
- Magnets are strong at poles
- Like poles of magnets repel and unlike poles attract each other
- Magnetic lines of force run from North pole to South pole
- Magnetism of a magnet can pass through non magnetic material
- When a magnet is broken into pieces, each piece becomes an independent magnet with both south and north poles.

Note: All illustrations of the above properties of magnets ref. baroque integrated science pupils book 7 pg 36 -37.

Magnetic substances are materials which a magnet can attract. Examples

- Iron
- Steel
- Lead
- Cobalt

Non-magnetic substances are materials which a magnet can't attract. Examples;

- Rubber
- Plastic
- Paper

- Cloth
- Wood

ACTIVITY

1. Define the following terms as used under electricity and magnetism

i) Magnetism

ii) A magnet

iii)Magnetic substance /magnetic

iv)Non magnetic substance /non magnetic

2. Using illustrations, identify the properties of magnets

3. State 3 examples in each of the cases below;

a)Magnetics

b) Non magnetic

LESSON 49

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : TYPES OF MAGNETS AND EXAMPLES

Read and Write

- Pole
- Attraction
- Artificial
- Temporary

Types of magnets

- Natural magnets
- Artificial magnets

Natural magnets

These are magnets that exist on their own in nature without man making them.

Examples of natural magnets

- Lodestone (magnetite)
- The earth.

Artificial magnets

- These are magnets made by man
- They are named according to their shapes. These include; Horse shoe magnet, Bar magnet, Needle magnet, Cylindrical magnets, Electromagnets.

Types of artificial magnets

These are;

- Temporary magnets –are magnets which lose their magnetism easily eg. Electro magnet
- Permanent magnets
- Permanent magnets retain their magnetism for long time.

Examples of permanent magnets

- Horse shoe magnet (diagram)
- Bar magnet (diagram)
- Cylindrical magnets (diagram)
- Needle magnet (diagram)

Advantages and disadvantages of temporary magnets.

Advantages

- They are used in electric bells

Disadvantages

- They lose their magnetism easily.

ACTIVITY

1. List down two types of magnets

2. What are natural magnets?

3. Identify any two examples of natural magnets

4. Give the difference between permanent magnets and temporary magnets.

LESSON 50

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : MAKING MAGNETS AND TERMS RELATED TO MAKING MAGNETS

Read and Write

- Stroke
- Induce
- Pole
- Force
- Magnetic

Terms related /used in magnets and magnetism

a) Poles of magnets. These are ends of a magnet
b) Magnetic field. Is the area around the magnet where the force of magnetism is formed
c) Magnetic line of forces. These are lines around the magnet through which magnetism runs from North to South Pole.

NB: Draw illustrations of the above.

Ways /methods of making magnet

i) Shocking method
ii) Induction method
iii) Electrical method

Note: All the above methods should be accompanied with illustrations.

ACTIVITY

1. Define the following terms as related to magnetism

a) Poles of magnets

b) Magnetic field

c) Magnetic lines of forces

2. Using illustrations show how the above terms can be justified in magnets.

3. Using diagrams and illustrations show /demonstrate the 3 methods of making magnets.

LESSON 51

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : DESTROYING AND PROTECTING OF MAGNETS

Read and Write

- Strong
- Hitting
- Rust
- Leave
- Like and unlike
- Hit
- Demagnetize

Ways of destroying magnets. The following are the commonest methods by which magnets are destroyed.

- By strong heating
- By hammering /litting
- Leaving magnets to East-west direction for long time
- Leaving magnets in water to rust
- Keeping magnets without iron keepers
- Keeping magnets with similar poles together for longtime.
- Passing a magnet is alternating current voltage several times

Ways of protecting magnets from demagnetization

- Painting them to prevent them from rusting
- Keeping them in iron keepers
- Storing them while facing in the North-South direction.
- Storing them while unlike poles together
- Protecting them against strong heat.

ACTIVITY

1.Define “demagnetization” as related to magnets

2. Identify ways of destroying magnets

3. State any three ways of preventing magnets from losing magnetism

LESSON 52

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : USES OF ELECTRICITY IN THE MODERN WORLD

Read and Write

- Amplify
- Pick
- Magnetic

Uses of magnets in the modern world

- They are used in compasses to show direction
- They are used in telegraphs and telephones
- They are used in generators to produce electricity
- They are used in industries to pick up heavy metallic magnetic objects
- They are used in electric bells.
- They are used in hospitals to remove magnetic materials from eyes.

ACTIVITY

1. How do doctors (oculists) make use of magnets when dealing with eyes?

2. What is the best direction in which a magnet should keep?

3. State the uses of magnets in the modern

LESSON 53

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : AN ELECTRO MAGNET

Read and Write

- Magnetise
- Lose
- Powerful
- Electro

An electro magnet

This is a temporary magnet made by the flow of current through a soft iron in a solenoid.
The iron becomes magnetized when electric current passes through the coil.
When the current is switched off, the magnet loses its magnetism.

Ways of increasing the strength of an electromagnet

- Increasing the voltage
- Increasing the turns in the solenoid

Advantages of using electromagnets

- Its strength can be increased

NB.
An electro magnet can be demagnetized by passing it through alternating current

Examples of equipment that use electromagnets

- Electric bell
- Sound amplifiers
- Generators

Uses of electric magnets

- They are in lifting heavy metallic scrap during smelting
- Used in electric bells

ACTIVITY

1. Write down any two equipment that use electro magnets

2. List down any two ways of increasing the strength of an electro magnet.

LESSON 54

TOPIC : ELECTRICITY AND MAGNETISM

SUB-TOPIC : AN ELECTRIC BELL

Read and Write

- Gong
- Flow
- Lose
- Withdraw

An electric bell

The structure of an electric bell Ref. to Baroque integrated science book 7 page 41 for the illustration and how an electric bell works.

Parts of an electric bell and their function Ref, to Baroque integrate science book 7 pg 41 for functions of parts.

- Batteries /source of power /electricity
- Bell switch
- Steel spring
- Contact screw
- Soft iron bar
- Hammer
- Gong
- Coils of solenoid

NB
In determining poling on an electromagnet. The end where current enters the solenoid becomes the South Pole and the end where it leaves it becomes the North Pole.

ACTIVITY

1. Describe how electric bell works can
2. Draw and label the parts of an electric bell
3. Identify 2 places where electric bells are installed.
4. How useful are the following parts on an electric bell

a)Gong
b) Hammer
c) Switch

LESSON 55

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : FRICTION

Read and Write

- Oppose
- Motion
- Surface
- Force

Friction
Friction is the force that tends to oppose motion between objects

Types of friction

- Static friction
- Dynamic friction
- Viscosity friction

Advantages of friction
Friction helps us in;

- Walking without slinding
- Movement of vehicles
- Lighting of match boxes with match box stick
- Braking of moving vehicles
- Climbing trees
- Writing using a pen etc.

Disadvantages

- Reduces speed of movement
- Reduces the efficiency of machines
- Delays work
- Causes unwanted heat and noise
- Makes one use a lot of effort.

Ways of increasing friction. Refer to comprehensive science pupils book 7 pg Baroque integrated science book 7 pg 64.

Ways of reducing friction. Refer to comprehensive science pupils book 7 pg Baroque integrated science book 7 pg 64

ACTIVITY

1. What is friction?

2. Identify the types of friction

3. Name the ways of how friction is useful

4. State the ways of reducing and increasing friction.

LESSON 56

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : MACHINES

Read and Write

- Simplify
- Complex
- Device
- Simplify
- Reduce

Machine

It is a device or tool used to simplify man's work

How machines simplify work

- By reducing the force used to do work
- Changing the direction of forces
- Increasing the speed of doing work

Types of machines

- Complex machines
- Simple machines

Common terms used in machines

1. Work. Is the product of force and distance moved by the load? Work done = Force X Distance. Work is measured in Units called Joules.
2. Force. Is a push or pull exerted on an object? Force is measured in Newton's (N)

NB. 1kg of force = 10N

3. Power. Is the rate at which energy is changed from one form to another ie. Rate of doing work. Its measured in Walts of Kilowatts (kw). 1kw = 1000w
4. Mass. It is the quantity of matter contained in a body. Its measured in grams.

ACTIVITY

1. Define a "machine"

2. Name the 2 type of machines

3. Identify and explain the following terms used under machines

a)Work

b) Force

c) Power

d) Mass.

4. Identify the standards units of the following,

a) Work

b) Force

c) Power

d) Mass.

LESSON 57

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : SIMPLE MACHINES (GROUPS OF SIMPLE MACHINES)

Read and Write

- Device
- Simplify
- Rate
- Load

Levers are a rigid bar (rod) turning freely at a fixed point called pivot.

Main parts of the lever

- Load
- Effort
- Fulcrum
- Effort arm
- Load arm

Classes of levers
Levers are grouped according to position and arrangement of load, fulcrum and effort. They are classified into 3 groups.

- First class lever
- Second class lever
- Third class lever

First class lever

It is where the fulcrum lies between load and effort

Examples;

- Crowbar
- Lid opener
- Beam balance
- See saw
- Pliers
- Scissrus etc.

Second class lever. Is the class of lever where the load lies between the fulcrum and effort.

Examples,

- Wheel barrow
- Nut cracker
- Human foot
- Bottle opener
- Oar of boat

Note: Refer to Baroque text book for drawing.

ACTIVITY

1. Define a lever

2. Name the main parts of the lever

3. Identify the 3 classes of lever

4. Give the meaning of each of the above classes of lever and give examples in each case

LESSON 58

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : THIRD CLASS LEVER

Read and Write

- Effort
- Load
- Pivot
- Turn

Third class lever

This is the lever where the effort lies between the load and the fulcrum.

Examples of third class lever are,

- Pair of tonge
- Pair of tweezers
- Fishing rod
- Spade when in use.

Advantages of using third class lever

- The effort moves through a short distance.

(Diagram, Baroque integrated science pupil's book 7 pg 71

ACTIVITY

1. Mention examples of machines under third class levers.

2. Give advantages of using third class levers.

LESSON 59

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : MOMENTS –THE LAW OF LEVERS

Read and Write

- Turning
- Principle
- Law
- Clockwise
- Anti clockwise

Moments

This is the turning effect of a force about appoint.
A forcing acting on appoint left of the pivot tends to turn it anti clock wise while a force acting on the right tends to turn the lever clockwise.

- For the lever to balance or be in equilibrium the left side moments must be equal to the right side moments.
- The law of levers. The sum of clockwise moments equals the sum of anticlockwise moments or the product clockwise moments is equal to the products of anticlockwise moments ie Load X Load arm =Effort X Effort arm.

Worked examples on levers

A man weighs 80kg and sits 4m away from the pivot. Where will his wife who weighs 60kg sit in order to balance the lever.

Solution

Load X Load arm = Effort X Effort

Load = 80kg
Load arm = 8m
Effort = 60kg
Effort arm Xm
80 X 4 = 60 X
320 = 60X
320/60 = 60/60

32/6 =X

The wife should be 51/3 M from the fulcrum. Ref. Baroque pupils book pg 72.

ACTIVITY

1. Give examples of machines under third class lever.

2. State the law of levers/ moments.

LESSON 60

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : MECHANICAL ADVANTAGE

Read and Write

- Ratio
- Simplify
- Load
- Effort

Mechanical advantage (MA)
Mechanical advantage is the number of times a machine simplifies a given work . Mechanical advantage is the ratio of the load to effort ie.

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

NB: If the mechanical advantage of the machine is greater than 1 less effort is used. Where as when the MA is less than one 1 a lot of effort is needed.

Example,

An effort of 40N is applied to a lever to overcome a load of 200N. Calculate the MA of the machine.

Solution

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

$$= \frac{200N}{40N}$$

$$= 5.$$

Meaning that the work was made easy 5 times

ACTIVITY

1. Define mechanical advantage of a machine

2. Calculate the mechanical advantage in the following situations

a)L = 60 and E = 30

b) L = 64 and E 32

c) L = 120 and E 40

LESSON 61

TOPIC : SIMPLE MACHINES AND FRICTION

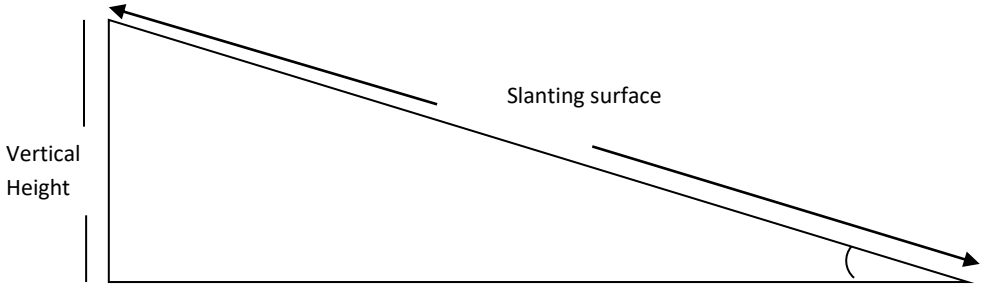
SUB-TOPIC : SLOPES AND INCLINE PLANES

Read and Write

- Planes
- Slope
- Slanting
- Level

Slopes and inclined planes

An incline plane is a sloping /slanting surface connecting a lower level at a higher level



The vertical height of the inclined plan is the distance moved by the load while the slanting surface is the distance moved by the effort.

- Star case
- Winding road
- Ramp
- A ladder leaning against the wall.

NB: Calculation about slopes. Ref comprehensive science pupils book 7 pg

ACTIVITY

1. Define inclined planes?

2. How are inclined planes and slopes able to simplify work?

3. State any 2 ways of how slopes and inclined planes are useful

4. Give 4 examples of slopes and inclined planes.

LESSON 62

TOPIC : SIMPLE MACHINES AND FRICTION

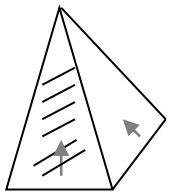
SUB-TOPIC : WEDGES

Read and Write

- Double
- Scissors
- Chisel
- Bullet

Wedges

What is a wedge?
A wedge is an inclined plane with two slopping surfaces i.e. Double inclined plane.



Give the examples of wedges, illustrate them

- An axe
- A panga
- Bullet
- Chisel
- Knife
- Scissors
- Nails

Uses of wedges

- For splitting logs of wood
- For cutting objects
- For sewing
- For digging

ACTIVITY

1. Name examples of wedges common in our homes

2. Identify activities done using wedges.

LESSON 63

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : SCREWS

Read and Write

- Fasten
- Thread
- Rod
- Pitch
- Wound

SCREWS

A screw is an inclined plane wound round a rod. Screws help to make work easier because they work like inclined planes

The structure of the screw Ref. Baroque integrated science pupils book 7 page 77.

Parts of the screw

- Rod
- Pitch
- Threads

Examples of screws

- Motor car jacks use screws to lift heavy vehicles
- Engineers vices used in mechanics to hold metals, use screws
- Bolts and nuts have screws inside them

Uses of screws

- For covering bottles and jar lids
- Used in drilling machines etc.

ACTIVITY

1. Define

2. Draw and label the parts of the screw

3. Identify any three 3 examples of screws

4. State the use of screws in our dairy life

LESSON 64

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : WHEEL AND AXLE

Read and Write

- Axle
- Votate
- Knob
- Fix
- Shaft
- Rotate
- Radius

Wheel and axle

What are wheels and axles?
These are machines composed of 2 rotating wheels fixed together.

The wheel is fixed on a small wheel axle or shaft into which it rotates.

Structure of a wheel and axle. Refer to comprehensive science pupils book 7 page 67.

Examples of wheel and axles

- Car steering wheel
- Handle of bicycle
- Pedal
- Egg beater
- Wind lass

Advantages of wheel and axle. Ref to comprehensive science pupils book 7

ACTIVITY

1. Define “wheel and axle”

2. Draw and name different examples of wheel and axle

3. Identify any 5 examples of wheel and axles

4. State any 2 ways how wheel and axle are useful in our daily life

LESSON 65

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : PULLEYS (SINGLE FIXED AND SINGLE MOVABLE)

Read and Write

- Effort
- Load
- Fulcrum
- Rod
- Block
- Rope
- Chain
- Groove
- Rim

A PULLEY

A pulley is a freely rotating wheel with a grooved rim.
A rope of chain passes over the pulley and its prevented from slipping of by the grooved rim.
The frame which holds the pulleys is called Block

Types of pulleys

- Single fixed pulley
- Single movable
- Block and tackle (fixed movable pulley)
  Note: Structures for the types of pulley (Ref. Baroque integrated science pupils book 7 pg 81-82

Calculations under single movable and single fixed pulley

Single movable pulley	Single fixed pulley

Ref. Baroque integrated science pupil's book 7 pg 81-82

ACTIVITY
1. Define a pulley?
2. Identify the 3 types of pulleys
3. Calculate the force (effort) needed to lift the load of;

a) 50kgf
b) 20kgf

LESSON 66

TOPIC : SIMPLE MACHINES AND FRICTION

SUB-TOPIC : USES OF PULLEYS

Read and Write

- Rim
- Groove
- Chain
- Rod

Uses of pulleys

- They are used in breakdown vehicles for towing vehicles with mechanical problem
- They are used in lifts of buildings
- They are used in scaffolds by painters to paint high buildings
- They are used in cranes used by builders who build buildings to heavy blocks, cement, bars and concrete.
- They are used to lift soil from pits of latrines.

ACTIVITY

1. What is a single movable pulley?

2. Name any 2 activities in our daily life where single fixed pulleys are used.

3. State the other uses of pulleys in our day to day activities.

LESSON 67

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : TYPES OF ENVIRONMENT AND COMPONENTS OF THE ENVIRONMENT

Read and Write

- COMPONENT
- SURROUNDING
- DEPEND
- ENVIRONMENT

Environment

Environment is man and his surroundings.

Components of the environment

- Plants
- Animals
- Water bodies
- Air
- Soil

NB:
plants and animals are examples of organic components of the environment.

1. Biotic /non physical environment. This is the type of environment which consists of living things e.g. Plants, animals, human beings, bacteria, fungi and viruses.
2. A biotic /physical environment. This is the type of environment which consists of non living things e.g. Soil, water, air.

NB: All components of the environment depend on each other mostly for survival

Interdependence
This is the situation where living things depend on each other so as to survive.

This is a situation where living things depend on non living things.

How animals depend on plants

- Animals depend on plants for food

- Animals depend on plants for shelter /habitat
- Animals depend on plants for herbal medicine
- Animals depend on plants for oxygen.

How animals depend on other animals

- Animals depend on other animals for protection for those that ore in herds.
- Some animals get food from other animals e.g. Scavengers
- Some animals use other animals for transport.

How plants depend on animals

- Plants get carbon dioxide from animals
- Plants obtain manure from animals
- Animals help in pollination of plants
- Animals help in and fruit dispersal

ACTIVITY

1. Define the word “environment”

2. What is the meaning of “interdependence?”

3. State any two ways how animals depend on plants

4. State any two ways how plants depend on animals.

LESSON 68

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : ANIMALS DEPENDING ON OTHER ANIMALS

Read and Write

- Surrounding
- Depend
- Component
- Survival

How animals depend on other animals

- Animals depend on other animals for protection.
- Some animals get food from other animals eg. Scavengers.
- Some animals use other animals for transport

How plants depend on other plants

- For support
- Plants depend on other plants for habitat
- Some plants provide other plants with shade
- Leguminous plants fix nitrogen in the soil which is used by other plants.

ACTIVITY

1. State any two ways how animals depend on other animals

2. Suggest any two ways how plants depend on other plants.

LESSON 69

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : INTERDEPENDENCE

Read and Write

- Component
- Environment
- Depend
- Surrounding
- Carbon dioxide

Interdependence of things in environment

1. Non living things on other living things.

- For protection against soil erosion by plants
- Bacteria help in soil formation
- Earth worms help in soil aeration

2. How plants depend on non living thins

- Plants obtain food from the soil

-plants use water and carbon dioxide as raw materials for photosynthesis.

- Plants depend on wind for pollination

-Plants depend on wind for dispersal

3. How animals depend on non living thins

- Insects live in the soil as habitat

-Birds use space to fly and hunt /look for food

-Some animals use stones for construction

- We breathe in (oxygen) for respiration

- Animals drink water to survive.

ACTIVITY

1. Define environment

2. Describe

a) How non living things depend on living things
b) How plants depend on non living things
c) How animals depend on non living things

3. State the habitat of the following

a) Earth worms
b) Man
c) Lion
d) Dogs

LESSON 70

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : FOOD CHAIN

Read and Write

- Chain
- Web
- Consumer
- Decomposer.

Food chain

A food chain is the way how organisms in the environment get their food.

A food chain is the flow of energy from one aorganism to another.

A food chain is the feeding relationship between organisms in the environment .

Illustration

Grass –Goat –Leopard –bacteria

Grass represents the producer

Goat represents the primary consumer

Leopard represents the secondary consumer

Bacteria represents decomposer.

1. Producer is the organism that makes food.
2. Primary consumer is an organism that feeds directly on producer.
3. Secondary consumer is an organism that feeds on primary consumer. They are mainly carnivorous.
4. Decomposer is an organism that causes decay /rotting.

Food web. Ref. comprehensive science by Mukisa Rasuuli

ACTIVITY

1.Use the food chain below

Cabbage -caterpillar -hen –man -bacteria.

Name

i)The producer

ii) The primary consumer

iii)The secondary consumer

iv)The decomposer.

LESSON 71

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : GROWING CROPS ANDTREES (AGROFORESTRY)

Read and Write

- Environment
- Producer
- Agro forestry

Agro forestry

It is the growing of crops keeping livestock and planting trees on the same farm.

Important of agro forestry

- Trees prevent rain from litting the soil directly hence controlling soil erosion
- Trees provide shade to other crops and animals
- Some trees are used as boundary and hedges
- Trees provide wood fuel
- Fruit trees provide to the farmer
- Crops residues can be used as feeds to livestock

Examples of indigenous trees and exotic trees

Indigenous

- Muvule
- Mangoes
- Jack fruit
- Ennongo
- Mutuba

Exotic trees

- Cypress
- Gingko
- Pine
- Cedar
- Podo
- Eucalyptus
- Fir

ACTIVITY

1. Define Agro forestry

2. State the advantages of agro forestry

3. State 5 examples of exotic trees

4. Identify 3 examples of indigenous trees.

LESSON 72

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : SELECTING TREES FOR PLANTING AND NURSERY BED

Read and Write

- Seed bed
- Nursery bed
- Seedling

Selecting of planting materials
- Trees grow from seeds or cuttings

Qualities of good for planting

- Seeds should have high germinating rate
- They should be free from pests
- They should be free from diseases
- They should not be broken
- They should be obtained from healthy parent plants /trees

Starting a nursery bed

A nursery bed is a place where seedlings are prepared from
In starting a tree nursery bed, the following are needed.

- Poles
- Hoes
- Haltering can
- Polythene papers
- Ground space
- Dry grass
- Water source
- Seeds or cuttings

ACTIVITY

1. What is a nursery bed?

2. State the difference between a nursery bed and a seed bed

3. Identify the qualities of a good seed or seeds for planting

4. State any 5 requirements for starting a nursery bed.

LESSON 73

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : PROCEDURES FOR PREPARING A NURSERY BED FOR TREES AND CARE FOR SEEDLING

Read and Write

- Nursery bed
- Seedling
- Seed bed

Procedure for preparing a nursery bed for trees

- Clean and dip up the area
- Add compost manure to the soil you have dug up
- Put seeds in the soil
- Construct a shade and cover it with grass
- Watering should be every evening to allow water stay soil for long.

Care for seedlings

- Constantly water the seedlings
- Remove any weeds
- Spray the seedling to control pests
- Thin out the diseased or those infected with pests
- Fence off the nursery bed to protect it against animals
- Hardening off should be done when about to transport the seedlings.

ACTIVITY

1. Identify ways of preparing a nursery bed

2. Describe the ways of caring for seedling

3. Give the meaning of the term “herding off”

LESSON 74

TOPIC : INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB-TOPIC : TRANSPLANTING AND CARE FOR TREES

Read and Write

- Seedling
- Watering
- Hardening off
- Pruning

Transplanting
Transplanting is the transfer of seedling from the nursery bed to the small garden.
Transplanting is done in the evening because of the following reasons.

i) Reduce the rate of transpiration
ii) Control weathering /wilting
iii) Give roots time to set in and start absorbing water.
iv) Reduce evaporation of water from the soil.

Caring for trees

This can be done through
1.Slashing

- Spraying with herbicides
- Planting cover crops
- Mulching
- Mechanical weeding using a hoe
- Uprooting

Practices in tree growing

- Weeding
- Mulching
- Pruning
- Thinning etc.

ACTIVITY

1. Give the meaning of the following practices in tree growing

i) Weeding
ii) Mulching
iii) Pruning
iv) Thinning

3. Suggest two reasons why transplanting should be done in the evening.

TOPIC: INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB TOPIC: METHODS OF HARVESTING TREES

Read and write

- Tip
- Trunk
- Stump
- Shoot

Method of harvesting trees (Ref. Baroque Pupils Bk7. Pg. 167)

1. Pollarding
2. Loopping
3. Coppicing
4. Selective felling of trees

ACTIVITY

(a) Draw and name the method of harvesting trees.
    1.
    2.
    3.
(b) Give any one advantage of harvesting trees by
    (i) selective felling
    (ii) Pollarding
    (iii)Coppicing

LESSON 77

TOPIC: INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB TOPIC: Preparing wood for different uses.

Read and write

- Shade
- Carbon dioxide
- Poles
- Evaporate
- Bark
- Split
- Warping

Preparing wood for different uses

- Timber for building and furniture is sowed into plants of specific sizes
- They are placed together on flat surface to ensure they remain straight
- Wood for firewood needs to be split and allowed to dry because wet wood does not burn well. Splitting of wood allows water to escape and evaporate easily to allow drying process.
- Wood meant for fencing and electricity poles should have their barks removed and chemicals used for treatment.
- This prevents attack from pests and diseases

Storage of wood

- Wood like timber should be stored in a cool dry place to avoid warping or bending
- Timber should be properly seasoned i.e. allow to dry in a cool dry place and chemicals applied.
- Fire wood should be stored in a dry place to avoid getting damp.

ACTIVITY

1. Give any two ways harvested trees are used.
2. Why should harvested trees be kept in a dry cool place?
3. How best should wood be stored
4. What is selective felling?

LESSON 78

TOPIC: INTERDEPENDENCE OF THINGS IN THE ENVIRONMENT

SUB TOPIC: WOOD LOT

Read and write

- Shade
- Carbon dioxide
- Purify
- Specie

Wood lot.

This is a small are that has been set aside for growing trees

Importance of the wood lot project.

- Trees provide firewood for cooking
- Trees provide timber for building and making furniture
- Trees are habitant of many insects, small mammals.
- Trees help to conserve soil and water
- Trees help to purify water

Factors to consider when starting a wood lot project

- Selection of multipurpose trees, species
- Drought resistant varieties
- Trees that mature faster in short time

Record keeping

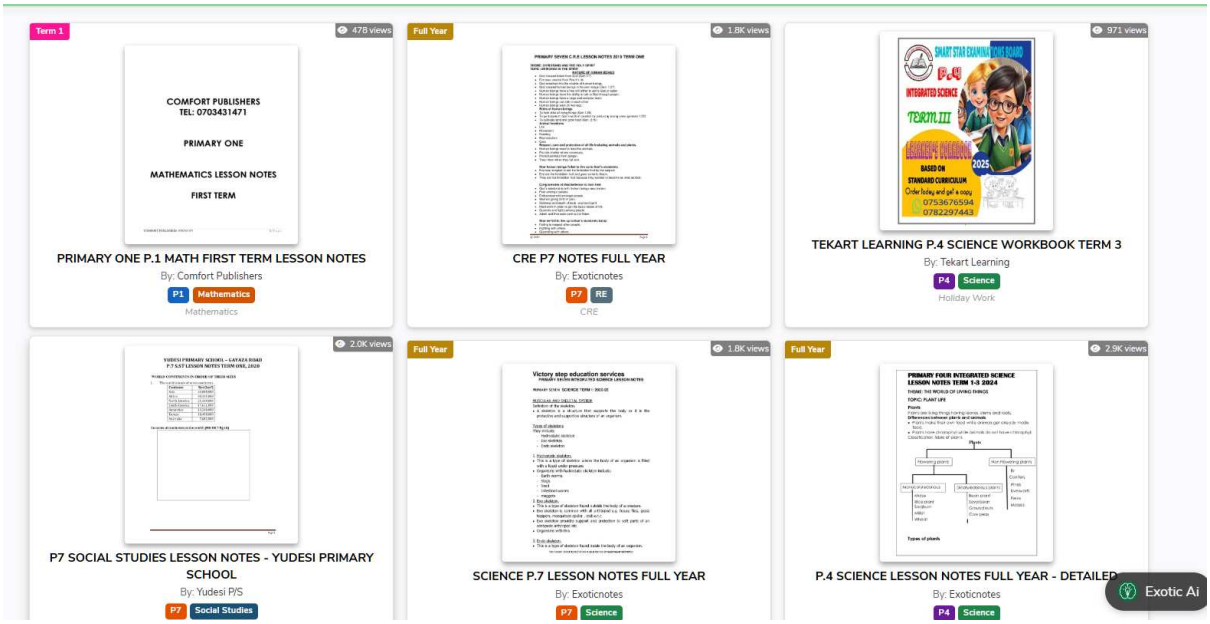
Under tree growing the following records should be made on.

- Type of crop to grew with in trees
- The type of trees to be grown
- Number of trees to be planted
- Spacing of tree and crops
- Time you spent to raise the trees and crops
- Time seeds spend in the nursery garden time.

ACTIVITY.

1. Define the advantages of wood lot project
2. State the advantages of wood lot project
3. Identify some of the factors to consider when starting a wood lot project.
4. Identify some of the records that can be taken in agroforestry

This document was downloaded from https://exoticnotes.com



Do you need more LESSON NOTES for Primary (All classes)?

Click
https://exoticnotes.com/notes/primary/

If you need LESSON NOTES for SCIENCE (P.1 – P.7)
Click
https://exoticnotes.com/notes/primary/science/

If you need LESSON NOTES for English (P.1 – P.7)
Click
https://exoticnotes.com/notes/primary/english/

If you need LESSON NOTES for Mathematics (P.1 – P.7)
Click
https://exoticnotes.com/notes/primary/mathematics/