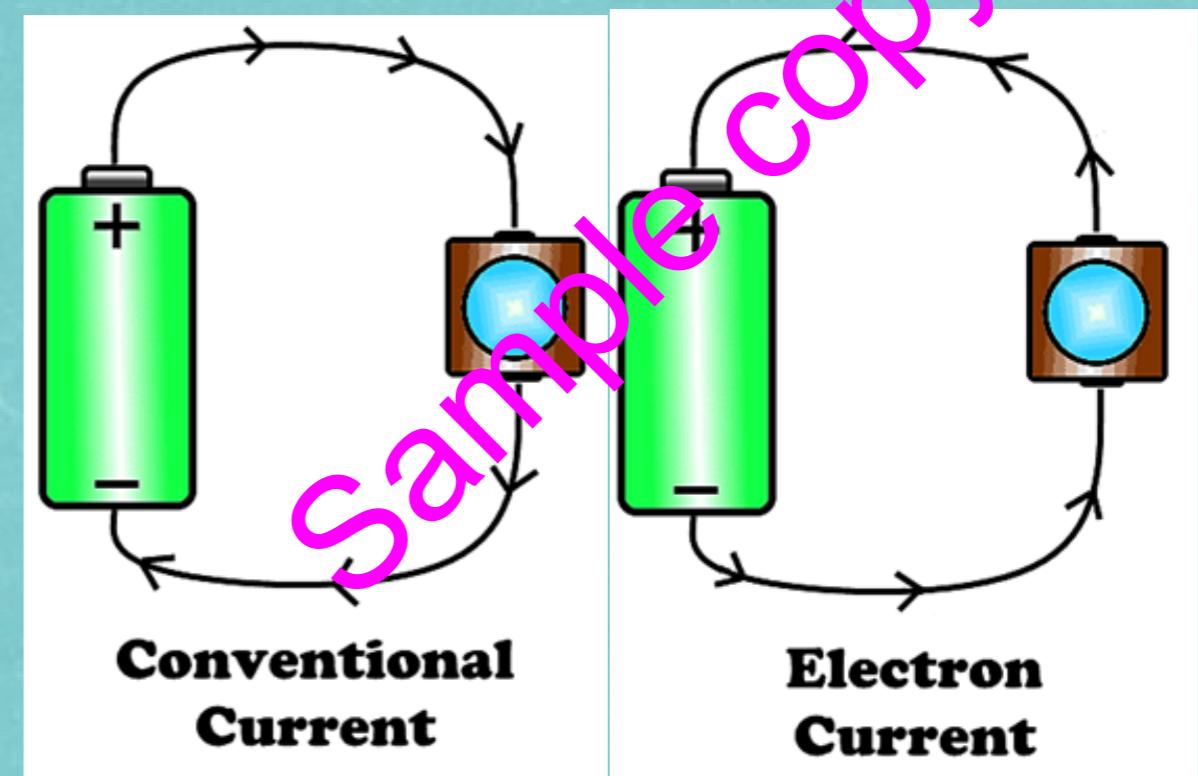


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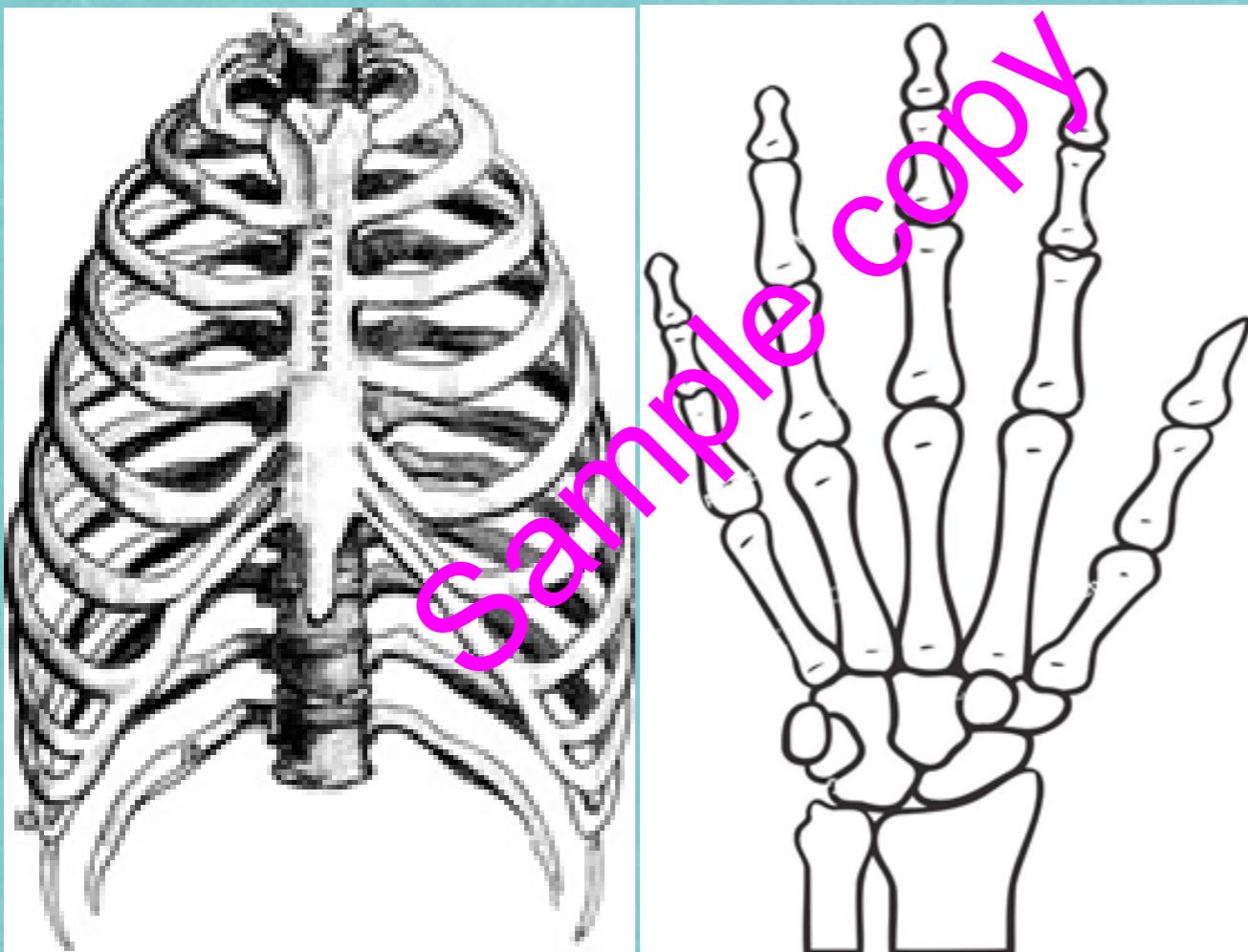
Self Study Module

Science



Student's Workbook

WAKATA



P.7 SELF STUDY MODULE - SCIENCE (STUDENT'S WORKBOOK)



P.7

Self-Study Module

Science

(Term 1 Workbook)

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- 2. Endoskeleton.** This is a type of skeleton found inside the body of a living organism.

Examples of organisms with endo skeleton are:
vertebrates like mammals, birds, reptiles, amphibians and fish.

- 3. Hydrostatic skeleton.** Is the type skeleton where the body is supported by fluid under body pressure

Examples of organisms with hydrostatic skeleton:

Worms like tape worms, earthworms, roundworms.

Mollusks: like snails, slugs,

Exercise 1.1

- 1.** What is a skeleton?

.....

- 2.** What does the term 'posture' mean?

.....

.....

- 3.** Name the joint that allows movement like a hinge.

.....

- 4.** Which joint is also known as a 'ball and socket' joint?

.....

- 5.** What are voluntary muscles?

.....



Axial skeleton

- This consists of the following parts;
- Backbone (vertebral column)
- Skull (cranium / brain case)

NB: The axial skeletal region forms the foundation of the skeleton

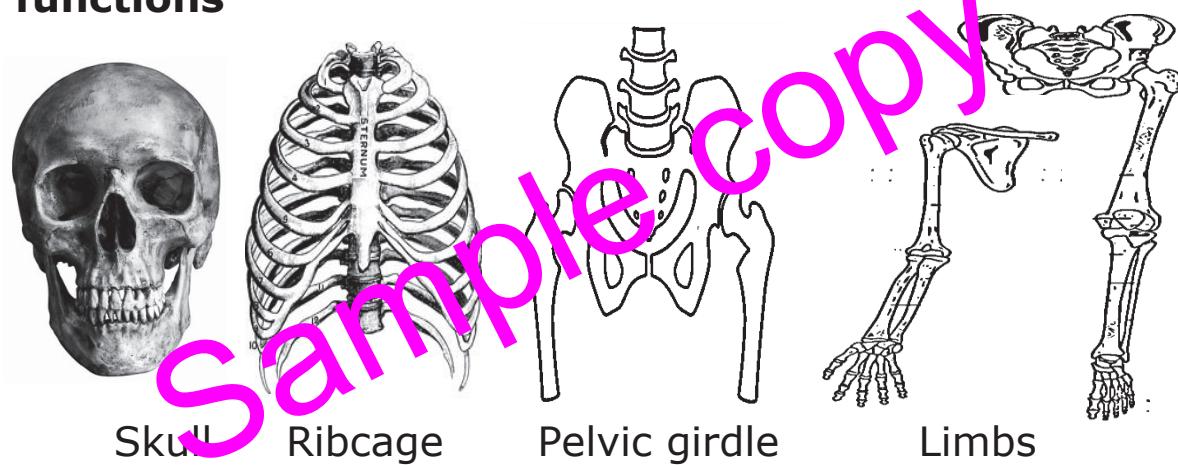
Appendicular skeleton: this consists of the following parts

- Limbs (fore limbs and hind limbs)
- Girdles (shoulder and pelvic)

Sections of the skeleton.

- The skull
- The ribcage
- The pelvic girdle
- The limbs

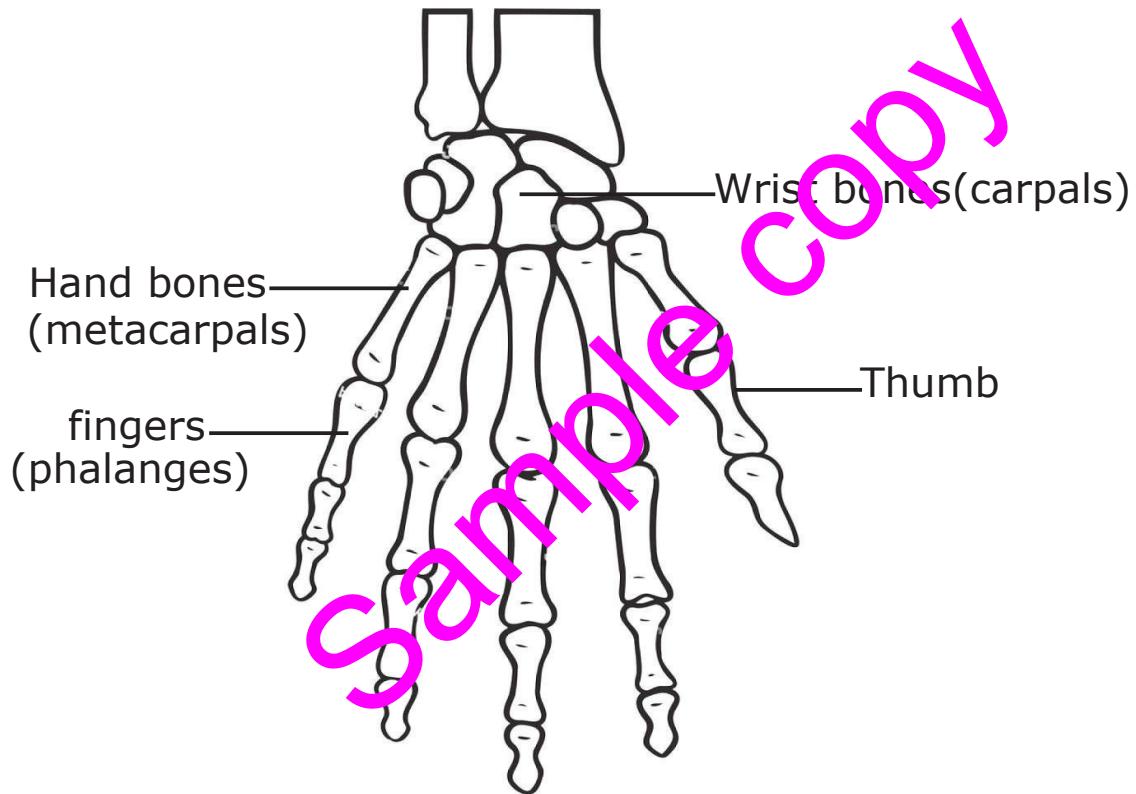
Diagrams of the above skeletal sections and their functions



Characteristics of immovable joints.

- Immovable joints don't have cartilages
- They don't have synovial membrane
- They don't have synovial fluid
- They don't have ligaments

Illustration of immovable joints



Types of joints.

There are four types of joints:

- Ball and socket joints
- Hinge joint
- Pivot
- Plane joints/gliding joints.

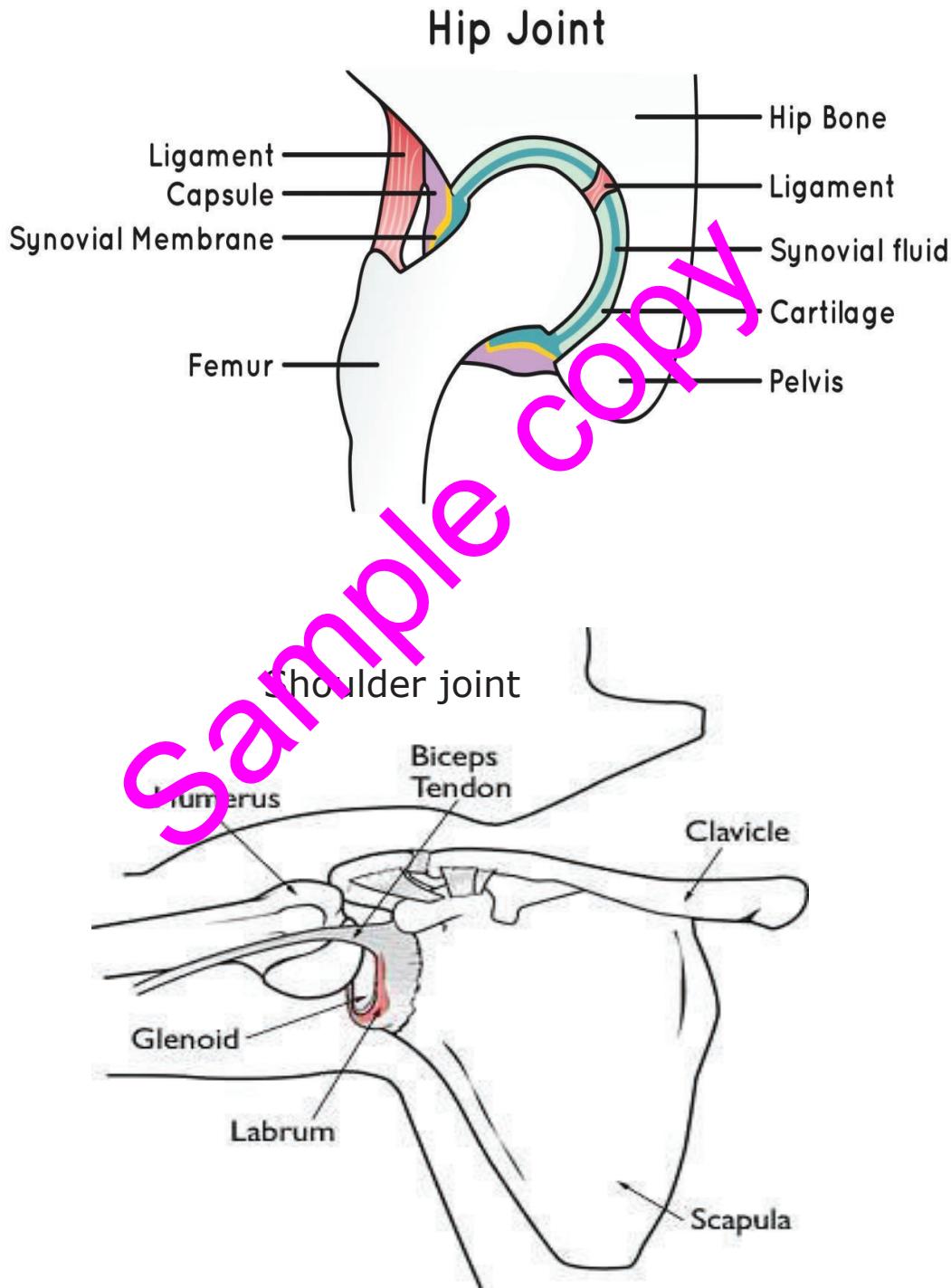
1. Ball and socket joint. This is a type of joint which allows movement in all planes.

Examples of ball and socket joints in the body.

- Shoulder joint

- Hip joint

A diagram of a ball and socket joint.

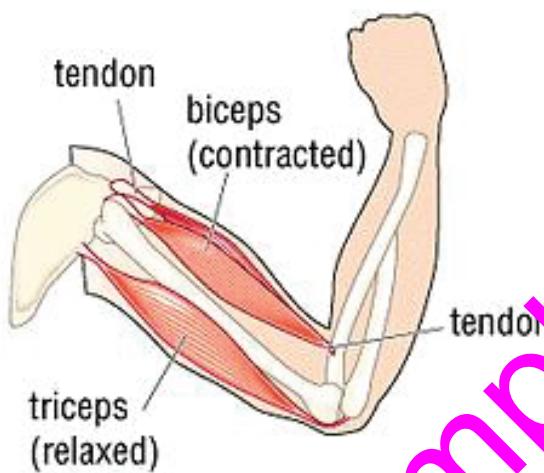


Examples of antagonistic muscles include;

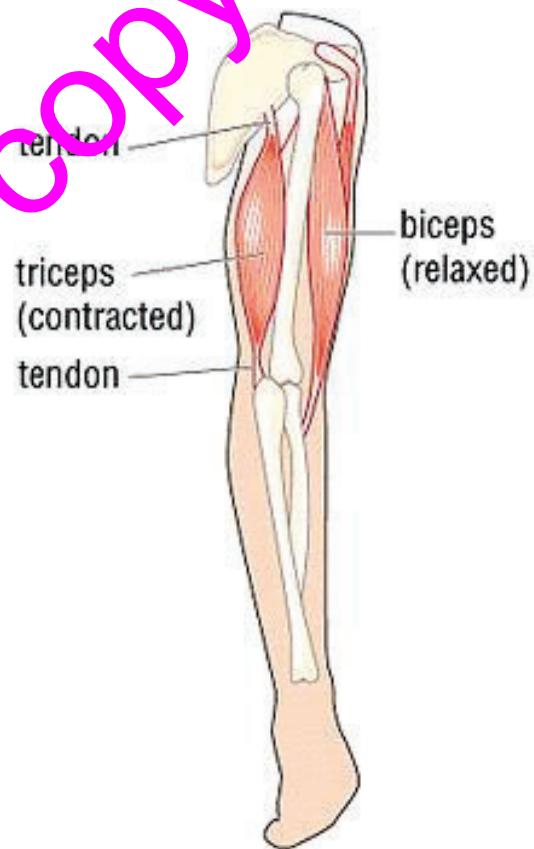
(i) Biceps (flexor)

(ii) Triceps (extensor)

When the arm is bent



When the arm is straight



Tendons and ligaments.

1. Tendons are tissues in the body that connect bones to muscles.
2. Ligaments are tissues in the body that connect bones to bones.

Exercise 1.3

1. How many bones does a baby have at birth?

.....

POSTURE.

- ✓ It is a way a person positions his body when sitting, standing or walking

The correct sitting Posture.

- ✓ Sit up straight on the chair.
- ✓ Place both feet on the floor.
- ✓ Put all your weight on both bottoms.
- ✓ Do not tighten your ankles and knees.

Right



Wrong



Right



Wrong



Importance of correct posture

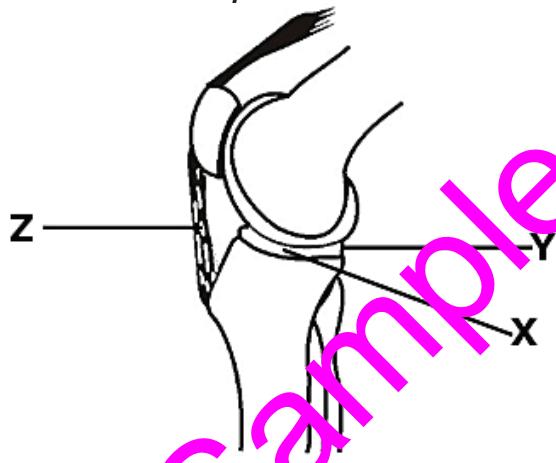
- (i) Prevents body aches.
- (ii) It prevents one from growing bent bones.(skeletal deformation)

- 21.** Why are molars and premolars described as having cusps or ridges?

.....
.....

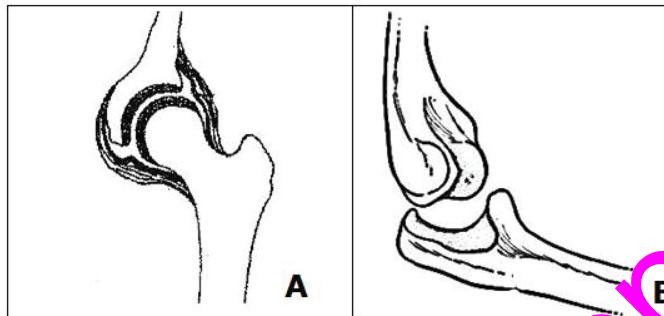
Examination type questions

- 1.** *The diagram below shows a human joint. Use it to answer the questions that follow.*



- (a) Name the parts marked with letters **Y** and **Z**;
- (i) **Y**
- (ii) **Z**
- (b) Give any **one** function of the fluid found in the place marked with letter **X**.
-
- (c) What type of joint is shown in the diagram above?
-

- 5.** *The diagrams below show two types of joints. Study and use them to answer the questions that follow.*



- (a) Identify the types of joints shown above.

A

B

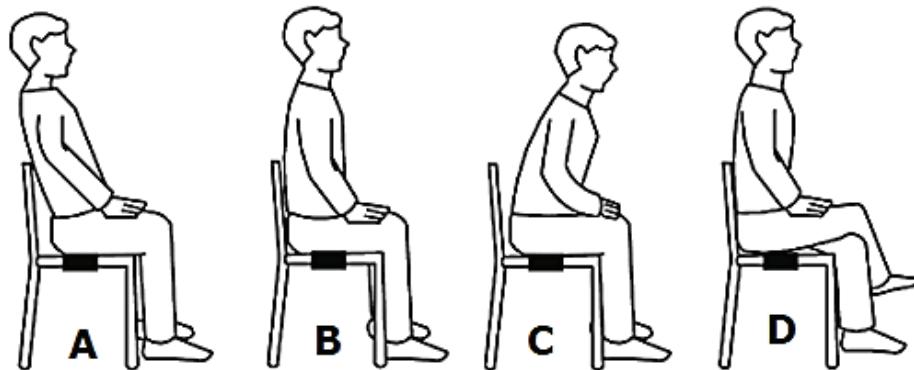
- (b) Give any **one** example of joint **A** in the body.

.....

- (c) Name the substance in the human body that helps to reduce friction around the joints.

.....

- 6.** **The diagrams below show different sitting postures.**



- (a) Identify a good sitting posture from the above.

.....

TOPIC 2: ELECTRICITY AND MAGNETISM

VOCABULARY

- | | |
|----------------------|-------------------------|
| • Electricity | Fuse |
| • Circuit | Switch |
| • Insulator | Magnet |
| • Dynamo | Electro – magnet |
| • Device | |

Electricity

Electricity is a form of energy produced by the flow of charges.

Sources of electricity

- Cells i.e. Dry cell, Simple cell, chemical batteries, solar cell accumulators.
- flowing water
- The sun.
- Fossil fuels.
- Wind.

ELECTRIC CELLS

Types of cells

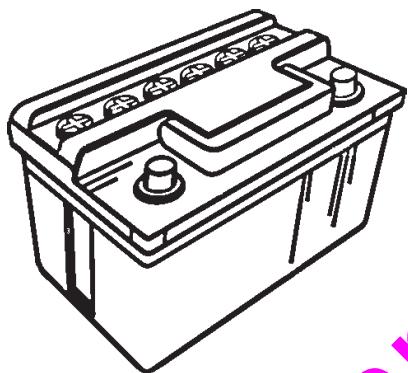
- 1. Primary cells** e.g.), Dry cells, a simple cell(wet cell)
- 2. Secondary cells/accumulators/storage cells.**
E.g. lead batteries, solar cells.



Chemical Battery

A Car battery is an example of chemical batteries. It has the positive (+) {anode} and negative (-) terminals {cathode} called **electrodes**. Chemical batteries convert **chemical energy** into **electric energy**.

Car battery



Advantage of using a chemical battery.

It can be recharged and used again when it has run down.

Running water

It produces hydro-electricity {H.E.P}.

For example electricity produced at Nalubale AND Bujagali Dams in Jinja.

Electric circuit

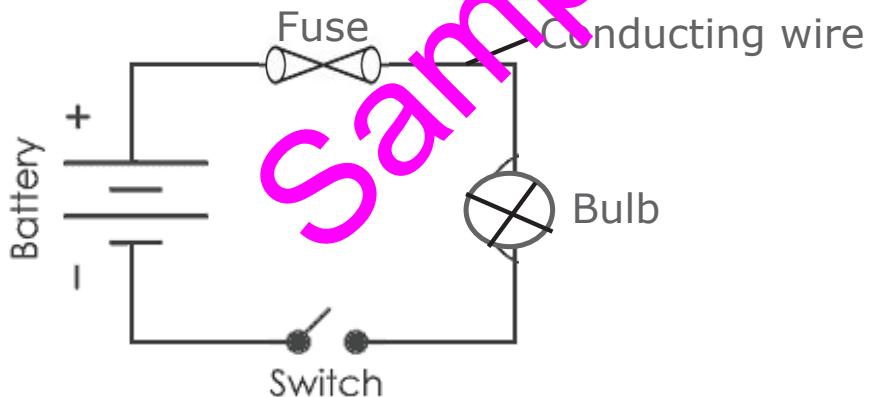
An electric circuit is a complete path through which electric current flows.

Components of an electric circuit.

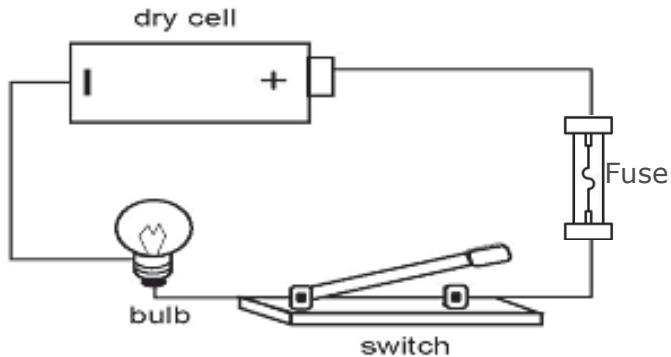
- An electric switch.
- An electric bulb
- ammeter
- Dry cells
- The conducting wire.
- Fuse

A simple electric circuit.

In symbol form



In diagram form



Uses of each component of a conducting wire

- (i) **Earth (yellow or green):** Minimizes excess current to prevent us from electric shocks.
- (ii) **Neutral (Blue/black):** Takes back current to the source.
- (iii) **Live (Red/brown):** brings current from the source to the appliance.
- (iv) **Insulation:** prevent electric shocks.

Exercise 2.5

1. Define a conductor of electricity.

.....
.....

2. List **five** examples of conductors of electricity.

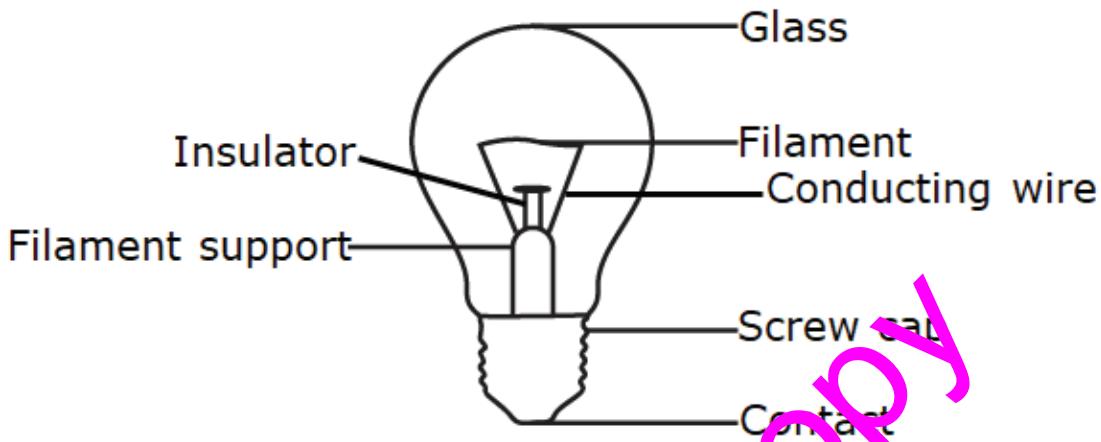
.....
.....
.....
.....
.....

3. Why is wet wood a good conductor of electricity, while dry wood is not?

.....
.....



The Electric Bulb.



Uses of parts of a bulb

- 1. Filament:** It produces light.
It is made of **tungsten** from a mineral called **wolfram**.

Adaptation of the filament for its function.

- ✓ It has a high melting point.
- ✓ It is coiled to increase electric resistance

- 2. Conducting wire:** It conducts electricity to the filament.

- 3. Glass:** Protects the inside parts of the bulb.

It prevents nitrogen and argon gases from escaping.

It is transparent to allow light to pass through.

- 4. Filament support:** It supports the filament.

- 5. Contact:** It allows electricity into the bulb.

- 6. Insulating material:** It separates the conducting wires.

25. Why is it dangerous to push metallic objects into sockets?

.....

26. Why should untrained individuals avoid repairing electrical appliances?

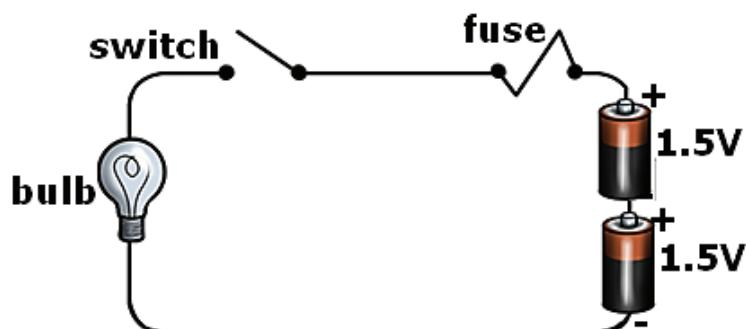
.....

27. What should you do if you see a fallen electric wire on the ground?

.....

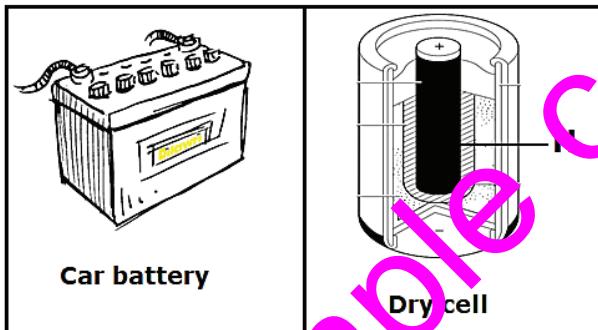
Examination type questions.

1. Study the diagram below and answer questions that follow.



(a) Calculate the voltage in the circuit above.

-
.....
8. *The diagrams below show sources of electrical energy. Study and use them to answer the questions that follow.*



- (a) What type of energy is stored in both the car battery and the dry cell?
.....
- (b) State the function of the part of the dry cell marked **H**.
.....
- (c) Why does a car battery last longer than a dry cell in terms of usage?
.....
- (d) State the energy changes that take place when a dry cell is in use.
.....

- 12.** (a) What is do you understand by the term **electrical resistance**?

.....

.....

- (b) Give the importance of the components of electric circuit below.

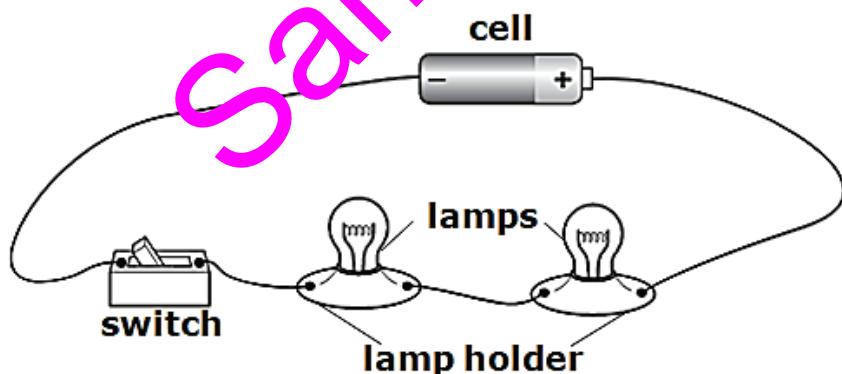
(i) **Voltmeter**

(ii) **Ammeter**

- (c) Why is a fuse made of thin wire with low melting point?

.....

- 13.** A P.7 student connected an electrical circuit as shown below.



State what will happen to the brightness of the lamps if the student;

- (a) adds another lamp

.....

- (b) replaces one of the wires with a wire that is 4 times longer.

.....

MAGNETISM

Is the property of a magnet which enables it to attract or repel other magnetic materials.

Magnet

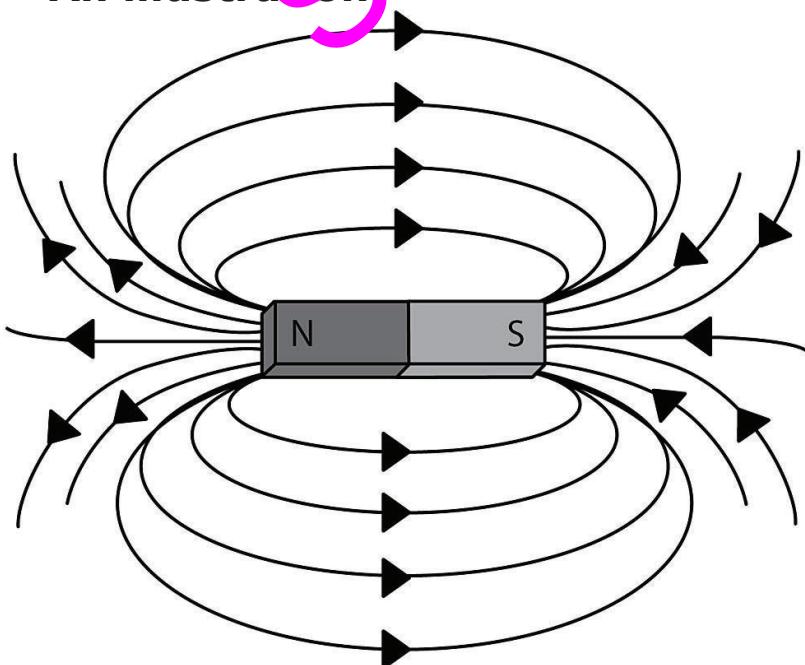
Is a material that produces a magnetic field.

A magnetic field: Is any region around a magnet where the lines of flux/force act.

Properties of magnetic fields.

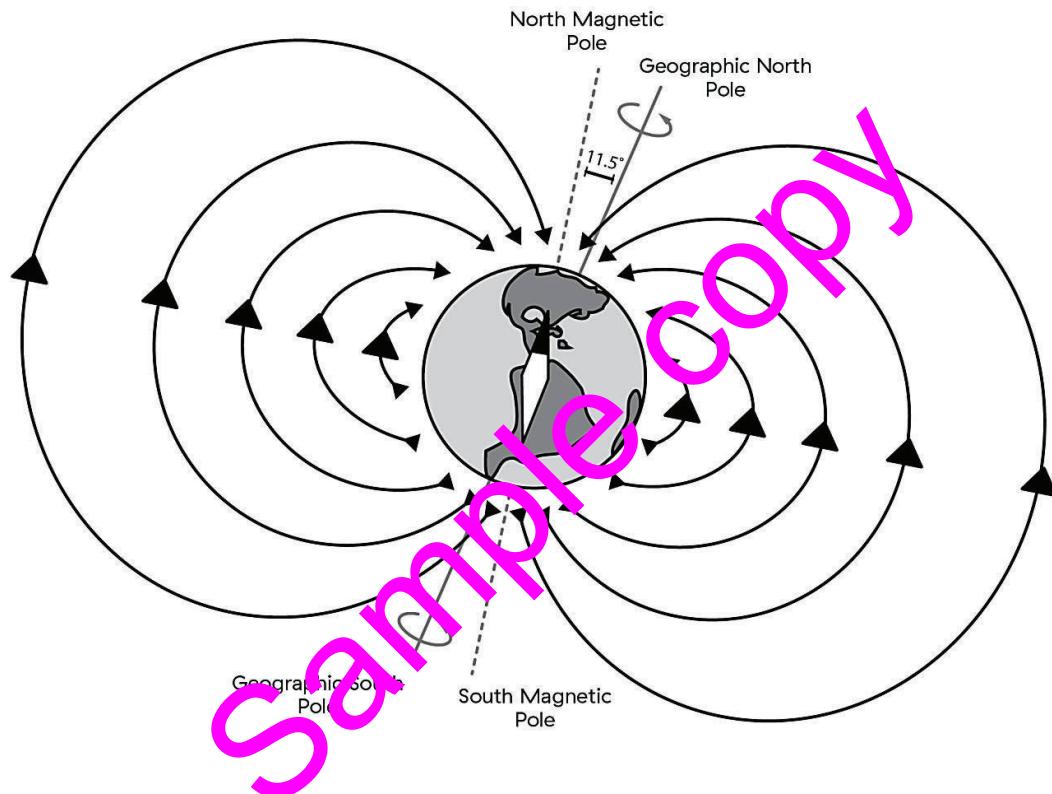
- Magnetic fields originate from North Pole and end at the South Pole.
- The lines of flux do not intersect with each other.
- A line of force/flux is continuous i.e. starts from the North Pole and ends in the South Pole.
- There is no force within the magnet itself.

An illustration



Examples of natural magnets.

- **The Earth;** It is a huge natural magnet. Its magnetic field is weak, that is why you can't feel it.



- **Lodestone/magnetite;** Lodestone is a magnetic ore which occurs naturally in the earth. It was discovered near the ancient city of magnesia in Asia Minor. It was the first magnet to be discovered by people.
- **Pyrrhotite:** It is also a natural magnet with a weak magnetic field.
- **Basalt:** It is a natural magnet formed when molten lava hardens

- **Uses of magnets in modern world of work.**
- Magnets are used in compasses by sailors, pilots and explorers.
- Electromagnets are used in industries to collect heavy scrap iron.
- An electric bell is also built on the principle of magnets.
- Magnets are used in telecommunication devices.
- Electric motors which produce electricity use magnets.
- They are used in loud speakers.
- They are used on doors of fridges.

Exercise 2.9

1. Name **three** methods of making magnets.

.....
.....

.....

2. What is the stroke method of making magnets?

.....

3. What is the difference between single stroke and double stroke methods?

.....
.....



How it works

- When the contact is made the soft iron becomes magnetized.
- It pulls the soft iron strip with the hammer.
- The hammer hits the gong producing sound.
- When the strip is pulled the soft iron loses its magnetism and the contact is broken because current is not flowing.

Generating electricity using a dynamo.

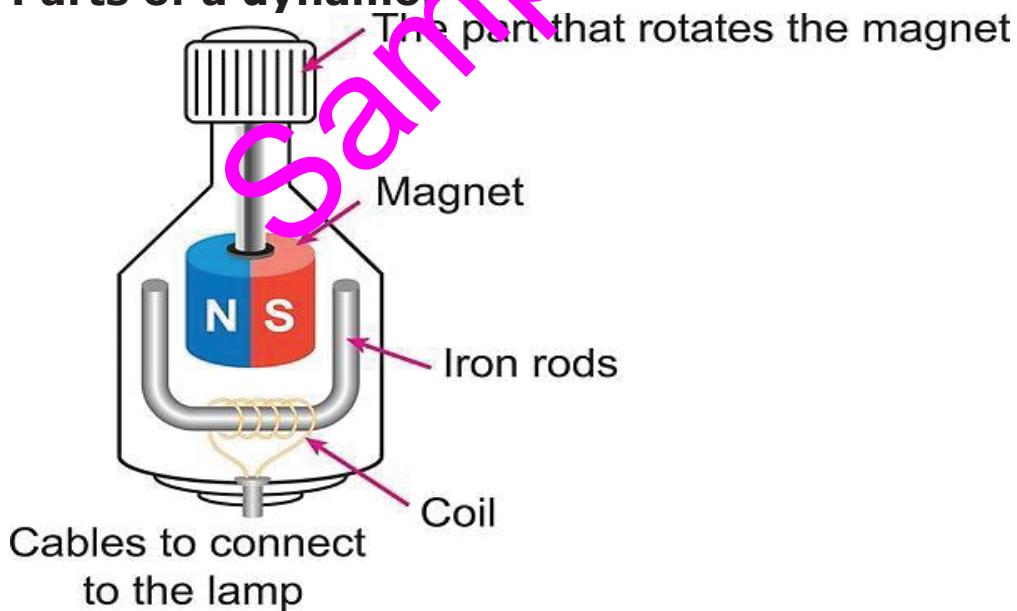
Dynamo.

A dynamo is a device which converts mechanical energy into electrical energy.

A dynamo uses **a permanent magnet** and a coil of wires on electro magnets

During the turning, the **mechanical energy** is turned into **electric energy**.

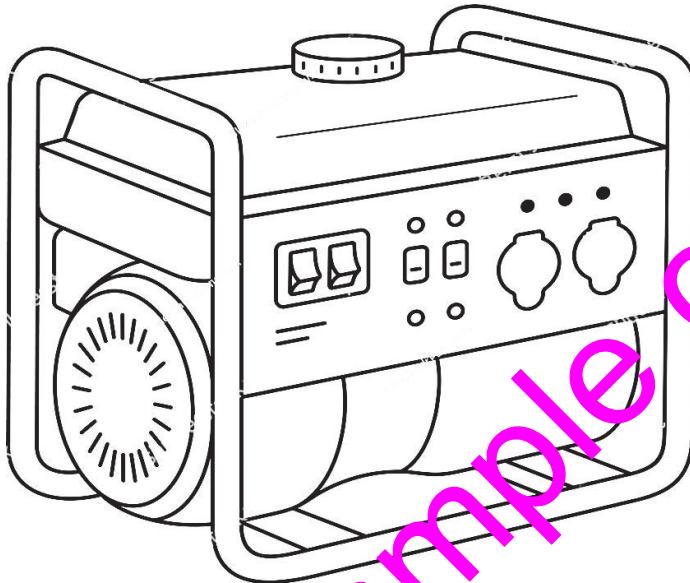
Parts of a dynamo



Generator

The type of current electricity produced is alternating current (**A.C**)

They change **Mechanical energy** to **electric energy**.



Uses of dynamos and generators

- Provide electricity for light.
- Provide energy to run machines.
- Provide energy for cooking
- Generators are used in hospital theatres incase power goes out.

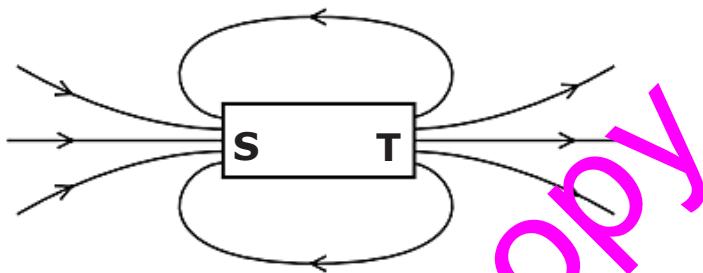
Exercise 2.91`

1. Name **three** appliances that use electricity.

.....
.....
.....

Examination type questions.

- 1.** The diagram below shows a bar magnet. Use it to answer question that follows.



Why do you think the pole marked **T** is a North Pole?

- 2.** (a) Give one reason why a magnet cannot attract pieces of wood.

.....

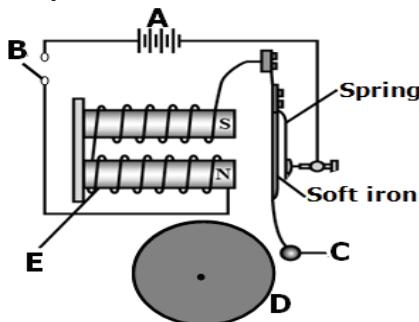
- (b) Give any three practices that can lead to destruction of a magnet.

(i)

(ii)

(iii)

- 3.** Study the diagram of an electric bell below and use it to answer questions that follow



- (d) What will happen to the magnet made above if the number of cells is increased?
-
.....

6. (a) Mention any **two** methods of magnetization.

(i)

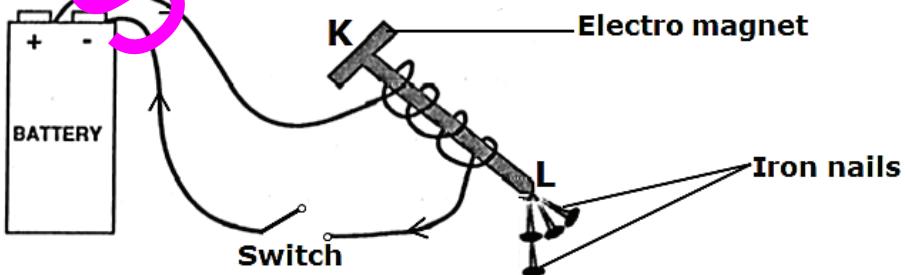
(ii)

- (b) Give **two** ways of increasing the strength of magnets made by electricity.

(i)

(ii)

7. Use the diagram below to answer questions that follow.



- (a) Name the pole marked **K**.

.....

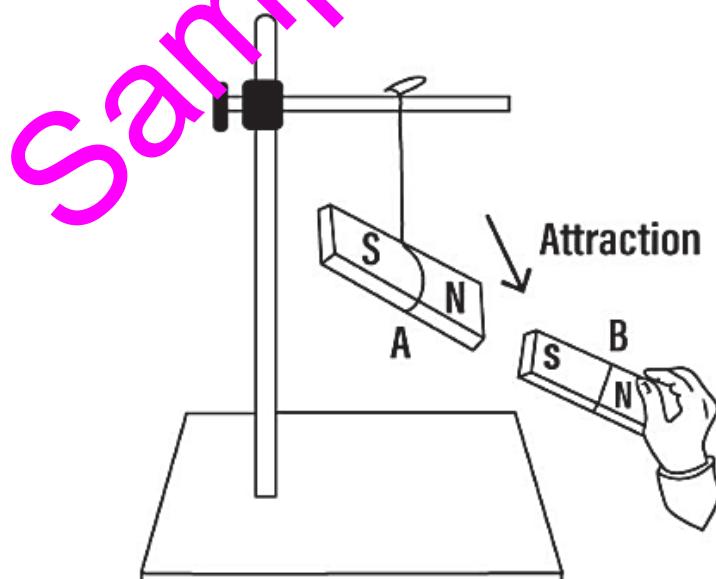
- (b) Why would the iron nails fall when the switch is opened?

.....

.....

- (b) Which property of magnets is illustrated in the diagram?
.....
- (c) State **one** way in which the magnet above can be made to lose its magnetic properties.
.....

10. Diagram below shows a property of a bar magnet. Use it to answer questions that follow.



- (a) Which property of a bar magnet is shown above?
.....
- (b) What will happen when magnet **B** is moved closer to magnet **A**?
.....

TOPIC 3: ENERGY RESOURCES IN THE ENVIRONMENT.

VOCABULARY

- **Resource**
- **Hydro**
- **Tidal**
- **Fossil**
- **Coal**
- **Petroleum**
- **Bio gas**
- **Bio fuel**
- **Wood fuel**

A RESOURCE

This is anything that people uses to satisfy their needs.

ENERGY RESOURCE

It is anything that provides people with useful energy.

TYPES OF RESOURCES.

1. Renewable resources. – Things that can be replaced naturally when used up.

Examples: Plants, animals, land(soil), water, air,

2. Non renewable resources.- Things that cannot be replaced when used up.

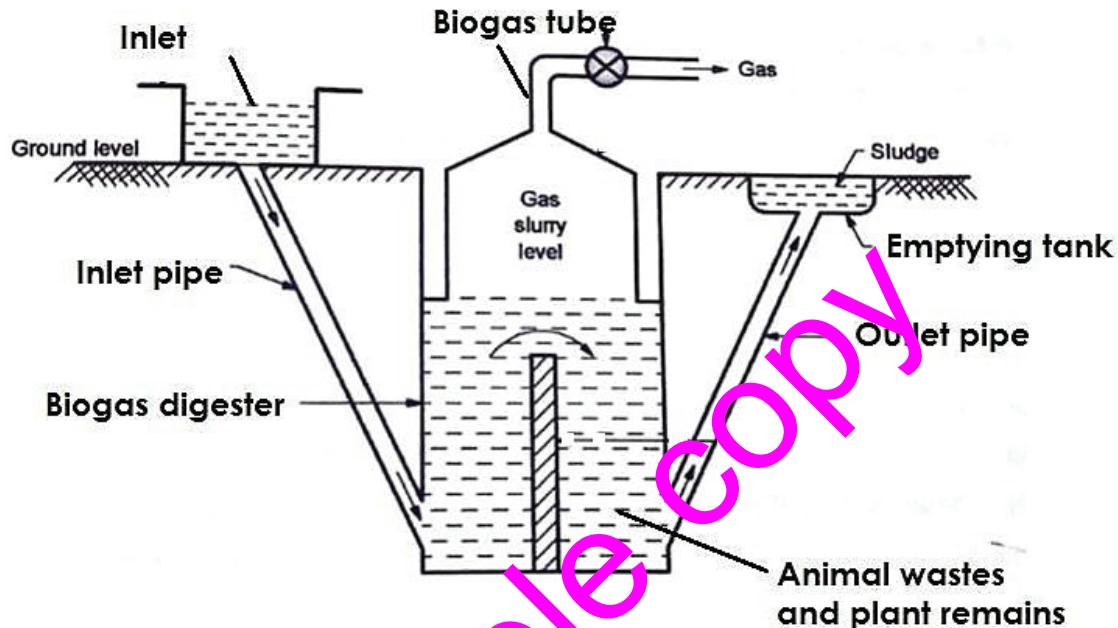
Examples: Minerals, rocks, fossil fuels.

Energy resources.

-Sun, Water, Minerals, Air or wind, Plants and Animals.



Structure of Biogas digester



Uses of the parts.

- Inlet: For inserting in plant and animal matter.
- Inlet pipe: allows plant and animal matter into the digester
- Outlet: For removing old used up matter to the garden.
- Emptying tank: Where used up matter is collected before it is taken to the garden.
- Biogas tube: It traps biogas and takes it to the heating or lighting equipment.

Uses of biogas

1. For cooking
2. For lighting
3. For heating.

Examination type questions.

- 1.** (a) Mention any **two** examples of energy resources.
(i)
(ii).....
 - (b) How does the use of charcoal saving stoves help to conserve the environment?
.....
.....
 - (c) Apart from light energy, state any other form of energy got from the sun.
.....
-
- 2.** (a) List down any **two** living components of the environment.
(i)
(ii).....
 - (b) Suggest any **two** ways how non-living components of the environment are important to man.
(i)
(ii).....



- (c) What do bacteria play during the formation of bio gas?
-

- (d) Which gas forms the largest percentage of bio gas?
-

6. *The diagram below is of a clay lined stove. Use it to answer the questions that follow.*



- (a) How does the stove above reduce the number of trees cut for fuel?
-

- (b) What fuel does the stove above use?
-

- (c) How is the fuel in (b) above made?
-

- (d) Why is part marked R usually kept open when the stove in use?
-

END