

**ASBAT EDUCATIONAL CONSULT**



---

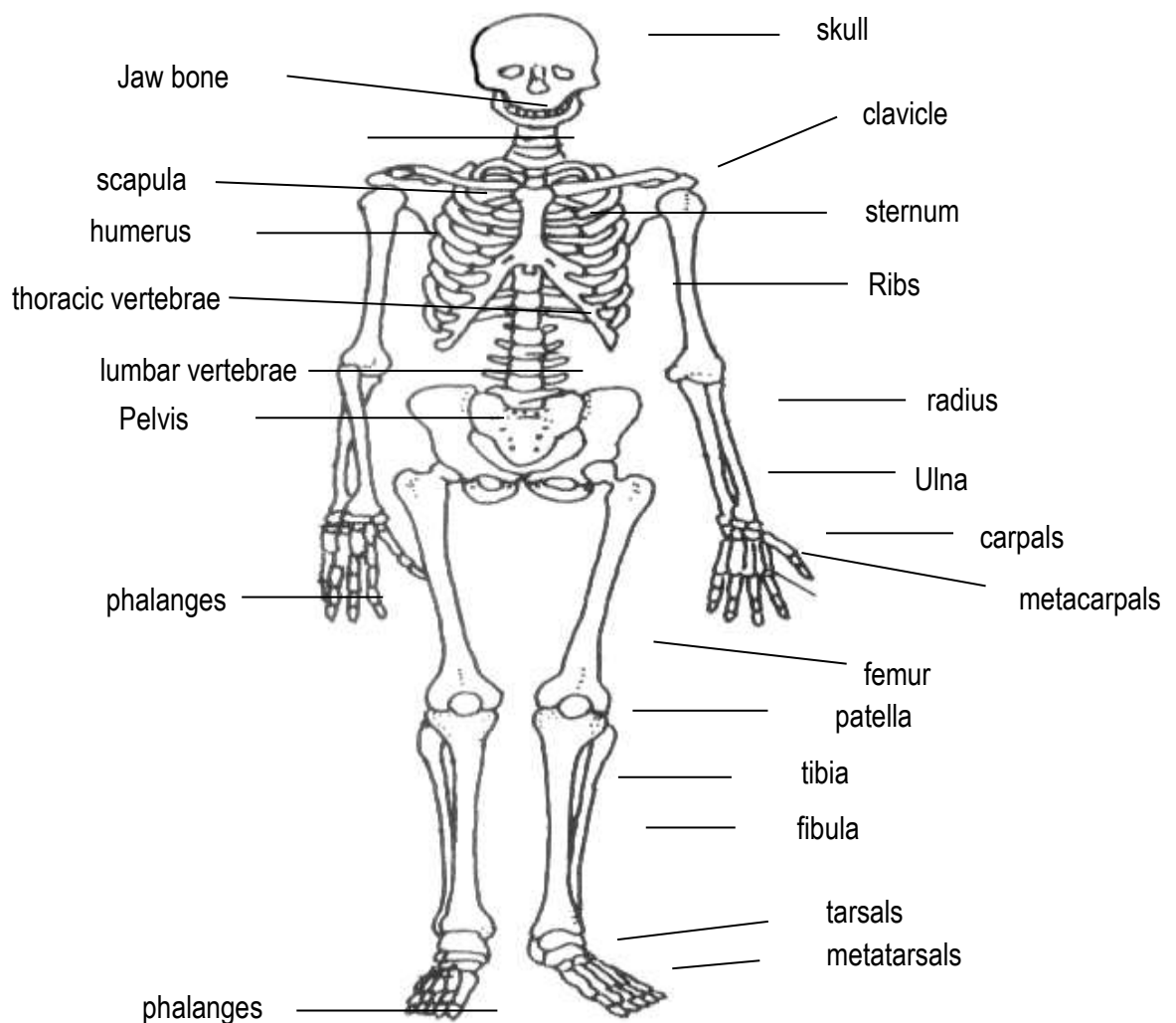
**SCIENCE**  
**LESSON NOTES TERM 1 2024**  
**0780243415/0705225627**

**P. 7**

## MUSCULAR – SKELETAL SYSTEM

- A skeleton is a supportive structure of an animal.
- Is a structure in the body that gives it shape, support and movement.
- Human skeleton is a frame work of bones in the body of a human being.
- The skeleton is hard because it contains non living mineral matter called calcium.
- The human skeleton is made up of 206 bones in total.
- The skull has 22 bones and the back bone has 33 bones.
- The largest, strongest and longest is femur the smallest is stapes in the ear.

### The structure of the skeleton



### Types of skeleton

- Exo skeleton
- Endo skeleton
- Hydrostatic skeleton.

### **Endo – skeleton:**

- is the type of skeleton found within the body of the organism.
- Endo skeleton is mainly found in vertebrate animals.

### **Regions of a skeleton**

1. Axial skeleton
2. Appendicular skeleton

### **Axial skeleton**

- It forms the foundation of the skeleton.
- Parts that make up the axial skeleton include: skull, back bone, thoracic region.

### **Appendicular skeleton**

- Is a region made of girdles and limbs.
- Girdles are pelvic and pectoral girdles.
- Pectoral girdle is found at the shoulder while the pelvic girdle is found at the hip.

### **Exo – skeleton:**

- is the type of skeleton found on the outside of the body of an organism.
- It forms a hard covering on the body of an animal called **cuticle**.
- It is commonly found on arthropods.
- The exo skeleton provides protection and support to the soft parts of animals.
- Animals with exo skeleton grow by **moulting/ecdysis**.

### **Hydro-static skeleton**

- Is the type of skeleton in the body cavity with fluid under pressure.

**NB:** The pressure of fluid and surrounding muscles are used to change the shape of an organism to produce movement.

- Hydrostatic skeleton is possessed by organisms with soft bodies such as: snails, earthworms, slugs, star fish, jelly fish, sea urchins, etc.

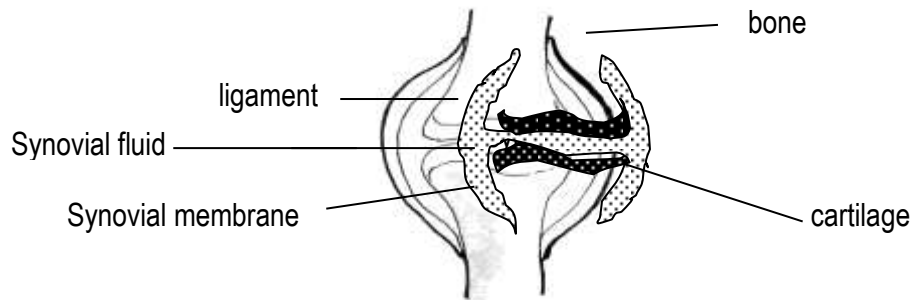
### **Functions of the skeleton**

- It gives the body shape and support.
- It protects delicate organs of the body e.g
  - spinal cord** – vertebral column
  - heart and lungs** – ribcage
  - eye** – orbit
  - brain** – skull
- It provides attachment for muscles to produce movement.
- The skeleton stores calcium and phosphorus
- The skeleton manufactures red blood cells, white blood cells and platelets in their marrow

## JOINTS

- A joint is a place where two or more bones meet in the body.

### Structure of a joint



### FUNCTIONS OF THE PARTS

- Cartilage:** It acts as a shock absorber, reduces friction.
- Ligament:** Joins a bone to a bone, prevents dislocation of bones.
- Synovial fluid:** Reduces friction at the joint.
- Synovial membrane:** Produces and stores synovial fluid.

**N.B** Ligaments reduce chances of dislocation.

### CATEGORIES OF JOINTS

- Movable joints
- Immovable joints

#### **Movable joints:**

- Movable joints are joints that allow movement.

#### **Immovable joints:**

- Immovable joints are joints that don't allow movement.

**NB:** Immovable joints have bones that are tightly held together.

### TYPES OF JOINTS

- Hinge joint
- Ball and socket joint
- Pivot joint
- Gliding joints/ plane joints

**1. Hinge joints** are joints that allow movement in one plane

#### **Examples**

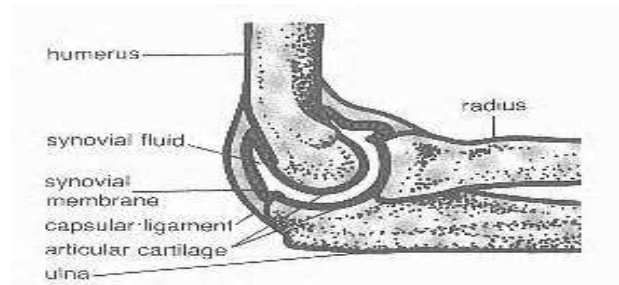
- knee joint
- elbow joint

#### **Places where hinge joints are found**

- at the knee
- at the elbow

## Elbow joint

### Structure of elbow joint/hinge joint



**2. Ball and socket joints** allow movement in all planes or directions i.e sideways, forward, backward and circular

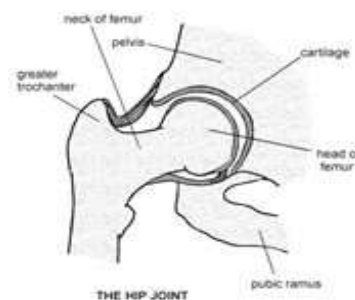
#### Examples

- shoulder joint
- The hip joint

**Places where ball and socket joint is found.**

- at the shoulder
- at the hip

### Structure of hip joint



**3. Pivot joints** are joints which allow rotation of certain parts of the body on other parts

#### Examples

- The neck vertebra
- The lumbar vertebra

**Places where pivot joints are found**

- At the neck

**4. Gliding joints** are joints where bones slide over one another easily

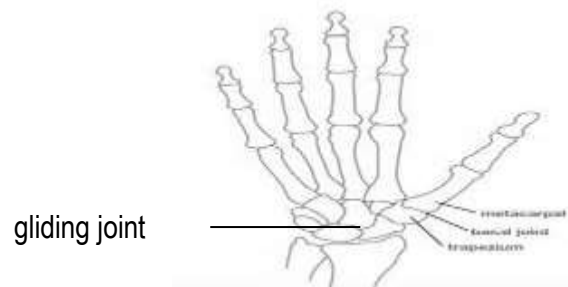
#### Examples

- ankle joint
- wrist joint

**Places where gliding joints are found**

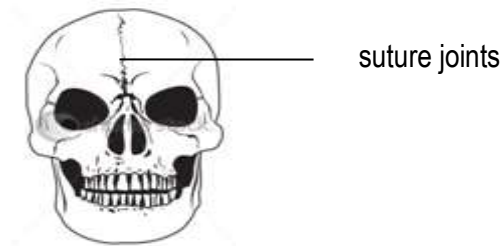
- at the ankle
- at the wrist

### Structure of a gliding joint



### Immovable joints

- Immovable joints are mainly found in the skull.
- Immovable joints found in the skull are called **suture joints**.



### Functions of joints

1. They allow movement of body parts.
2. Synovial fluid and cartilage prevent bone surfaces from wearing.

**How?** By lubricating the joint to reduce friction.

### Types of bones

#### **Long bones**

- These are found in the arms and the legs

#### **Examples**

- Ulna
- Femur/tibia
- Fibula
- Humerus
- radius

#### **Short bones**

- These include : carpals, tarsals, metacarpals, metatarsals, phalanges.

#### **Flat bones**

- Examples are; scapula bones of the skull, sternum, ribs, pelvis

#### **Irregular bones**

- These are found in the vertebral column i.e. the vertebrae, and the jaw bone.

#### **Round bones**

- Patella

### **Internal parts of a long bone**

### **MUSCLES**

- A muscle is an elastic tissue found in the body of an animal that contracts and relaxes to produce movement.
- Muscles are connected to bones by tendons

## **Types of muscles**

- Voluntary muscles.
- Involuntary muscles

### **Voluntary muscles**

- These muscles whose movement is controlled at will e.g. movement of arms and legs
- They are also called skeletal muscles because they are attached to bones.
- Voluntary muscles usually work in pairs.
- One muscle opposes the other.

### **The pair of voluntary muscles is made of:**

1. Antagonistic muscles(extensors)
2. Agonistic muscles(flexors)

**Antagonistic muscles** extend the size of the angle formed by the limb and the example are **triceps muscles**.

**Agonistic muscles** decrease or reduce the size of the angle formed by the limb and an example are **biceps muscles**.

**Voluntary muscles** are always attached to the skeleton and help to maintain body posture.

### **Examples**

- The biceps of the hand connect the scapula to the radius
- The triceps of the hands connect the scapula, humerus and ulna.
- Involuntary muscles are muscles whose movement cannot be controlled at will. E.g. movement of the stomach, intestines, heart etc.

### **Characteristics of voluntary muscles**

- They work under instructions of the brain.
- They contract rapidly.
- They get tired quickly.
- They are fibrous.
- The movement of involuntary muscles is automatic i.e. we have no control over them

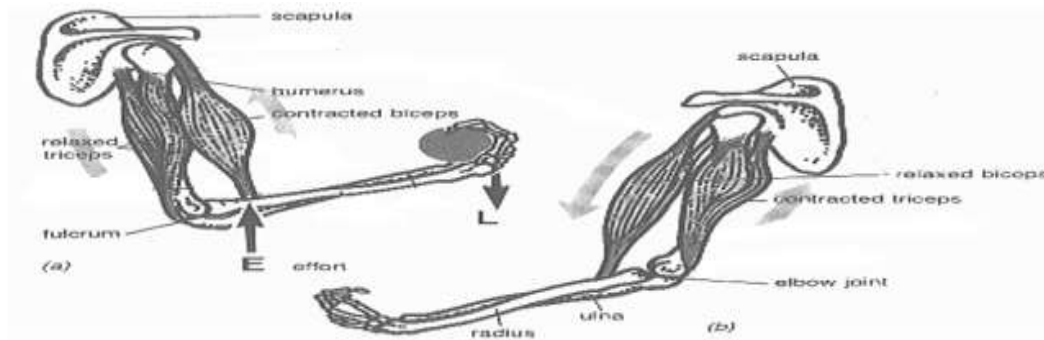
### **Examples**

- Muscle of the stomach and walls of the alimentary canal
- Muscles of the reproductive system
- Muscles of the blood vessels
- Muscles of the excretory system
- cardiac muscles
- Inter costal muscles
- Sphincter muscles.

### **Antagonistic muscles**

- These are pairs of muscles that produce opposite movement at the same time.
- When one contracts the other relaxes. e.g. biceps and triceps
- Biceps is the flexor muscle in the upper arm which bends the fore arm
- Triceps is the extensor muscle in the upper arm which extends (straightens) the fore arm

## BENDING OF THE FORE ARM STRAIGHTENING OF THE FORE ARM



### Functions of muscles

- They join some bones together in the body.
- They produce movement

**How?** By contracting and relaxing.

- They help in respiration.
- They maintain and change body posture.

### POSTURE

- Posture is the way of positioning the body when an action is taking place.
- We should maintain good posture in everything we do to maintain the muscular – skeletal system in good health and proper working condition

### Importance of good posture

- It keeps body organs of the abdominal cavity in the right position.
- It promotes proper development of the bones and muscles.
- Prevents backache.

### Dangers of poor posture

1. it leads to deformity of the skeleton.
2. It causes backache.

### Diseases of the skeletal/muscular system

#### Polio

- It is spread through contaminated food and drinks.
- It is caused by a virus
- It leads to high fever, lameness and paralysis of the limbs.
- Polio is controlled by immunisation and drinking boiled water.

#### Tuberculosis of the bones

- It is caused by a bacteria called mycobacterium
- It is spread through taking in contaminated milk from a tubercular cow.
- It mainly affects the spine leading to long lasting backache and paralysis of the legs
- It is controlled by drinking well boiled milk, early treatment of infected people.

#### Tetanus

- It is caused by bacteria from the soil
- The bacteria enter the body through fresh cuts and wounds
- It attacks muscles making them stiff and makes breathing difficult
- In newly born babies it enters through the umbilical cord if cut with dirty unsterilised instrument
- It is controlled through immunisation.



## **Rickets**

- It is a deficiency disease that affects bones especially during pregnancy when the mother did not eat enough foods rich in Vitamin D, calcium and phosphorous
- It leads to weak bones, common fractures, oxbow legs, knock – knee legs and poor teeth
- It is controlled by eating enough foods rich in Vitamin D, calcium and phosphorus in the diet.

## **Disorders of the skeletal and muscular system**

- fractures
- sprains
- strains
- dislocations

## **How to maintain the skeletal system in proper working conditions**

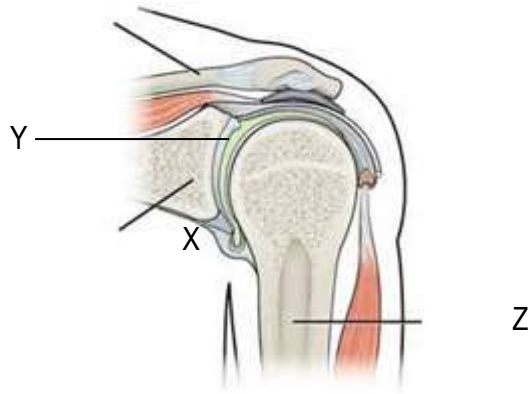
- Eat foods rich in a balanced diet with more of foods rich in vitamin D, calcium and phosphorus.
- Take children for immunisation against tuberculosis, polio and tetanus early enough
- Have regular physical exercises
- Maintain proper body posture
- Avoid playing rough games like fighting, hitting, climbing trees
- Be so careful when using the road

## **Importance of regular physical exercise**

- They strengthen muscles.
- They promote proper circulation of blood
- They make digestion of food more efficient
- They break fatigue (body weakness)
- They make joints flexible
- They control obesity (promote weight loss)
- They increase energy production by the muscles
- They reduce the risk of heart diseases.

## **Self testing exercise**

1. What is a skeleton?
2. Mention 3 importance of the human skeleton.
3. Identify two types of skeleton.
4. Which types of skeleton is found in most vertebrates.
5. The longest bone in the human body is \_\_\_\_\_ while the smallest bone is \_\_\_\_\_
6. Study the diagram carefully and answer questions that follow.



7. Name parts.

a) x

b) z

8. Give the function of part y.

9. To which groups of bones does bone x belong.

10. Identify the movable joint shown in the diagram.

11. The biceps and triceps are examples of antagonistic muscles in the human body. Explain what happens to each of the muscles during the situations below.

	Biceps	Triceps
(i) flexion (bending)		
(ii) Extension (straightening)		

12. Give one example for each of the following types of bones.

13. short bones - \_\_\_\_\_

14. irregular bones - \_\_\_\_\_

15. long bones - \_\_\_\_\_

16. flat bones - \_\_\_\_\_

17. Identify one form of immovable joint in the human body and state where its found

18. Mention any 3 forms of movable joints you know.

19. How is the movement in the joint at the shoulder different from that at the knee?

20. Give any 3 diseases and 3 disorders of the muscular skeletal system

21. Mention 4 ways of keeping the muscular skeletal system in proper health conditions

22. Differentiate between the following

i. a ligament and a tendon

ii. a sprain and a strain

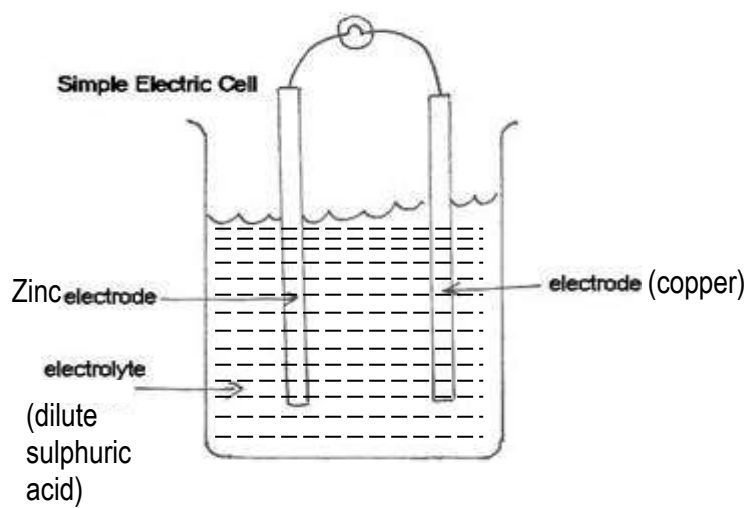
iii. a fracture and a dislocation

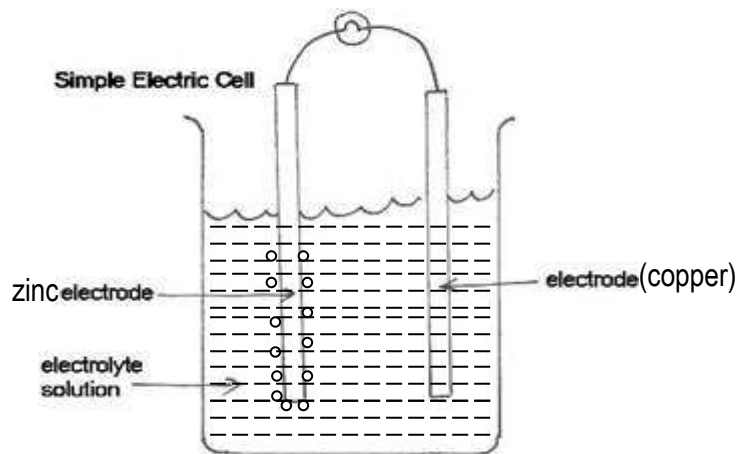
23. How are regular physical exercises important to the skeletal system? (Give 2 ways)

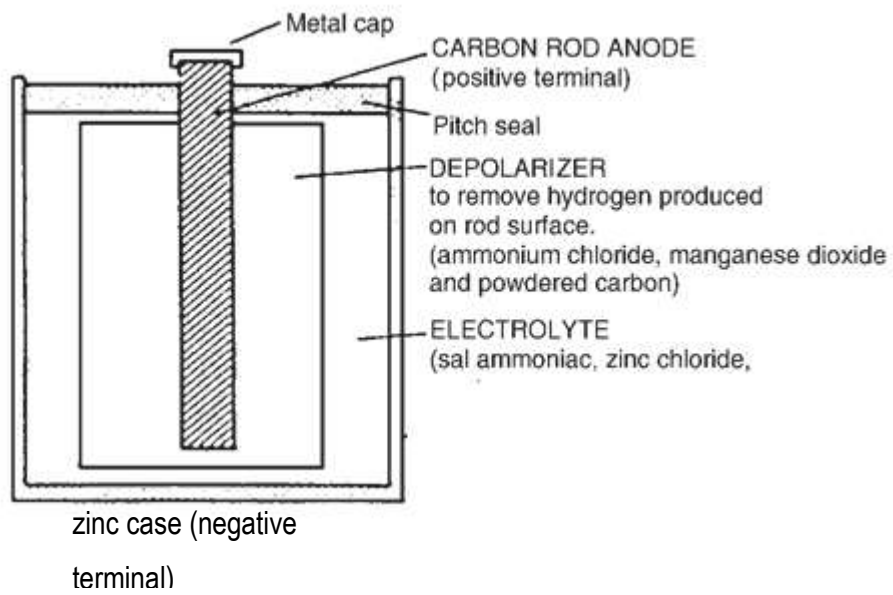
This is a product of **ASBAT Education Consult**|  
Located at Plot 3, KTS Road, **Makerere University**|  
Contact Us:0780243415 / 0705225627 | For More  
Resources, Visit: [www.asbatdigitallibrary.org](http://www.asbatdigitallibrary.org) |  
*Quality Education for All*

**TO HAVE A FULL VERSION OF THIS DOCUMENT  
PLEASE:**

**CALL: 0705225627 OR  
WHATSAPP: 0780243415**





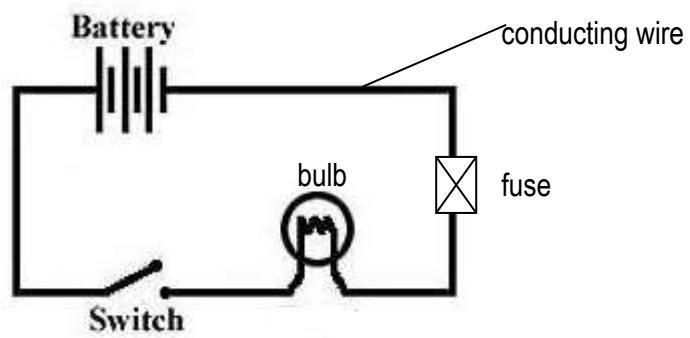









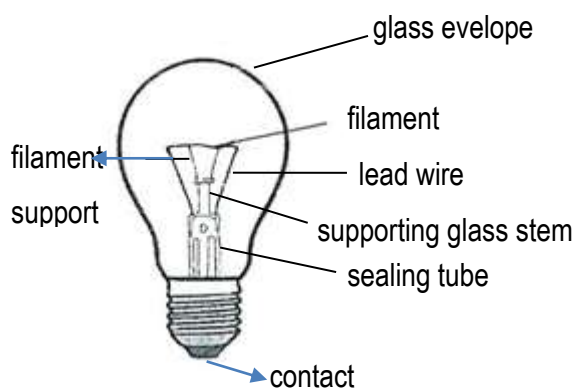
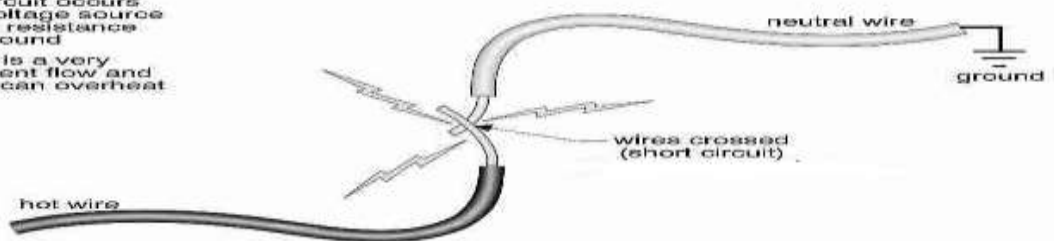


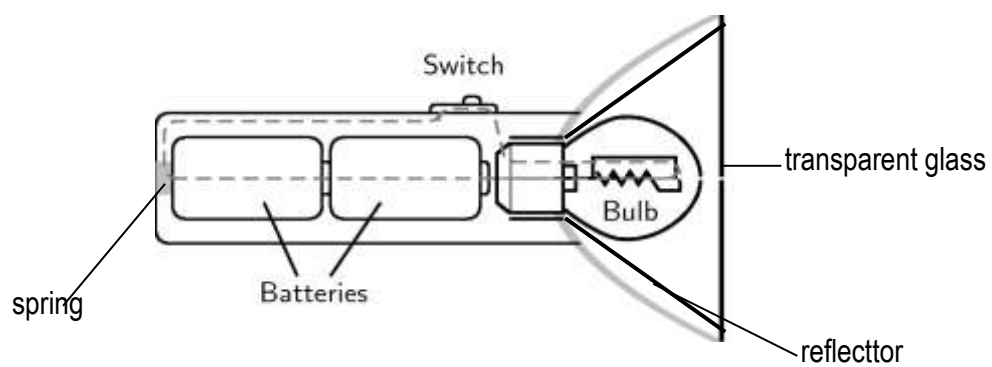




### Short circuit

a short circuit occurs when a voltage source has a low resistance path to ground the result is a very large current flow and the wires can overheat



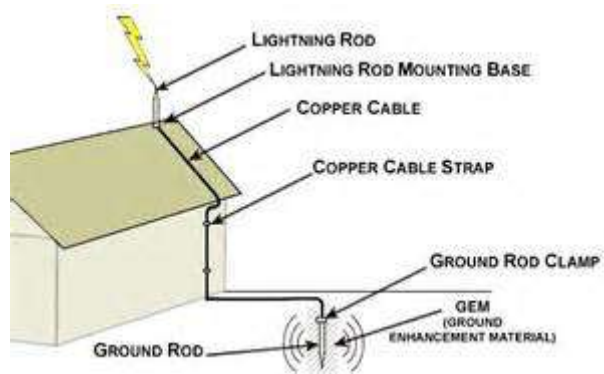


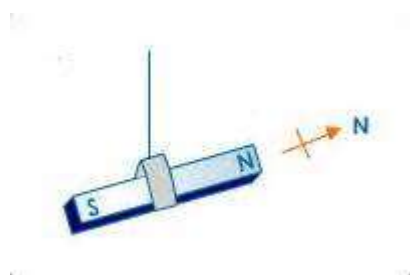


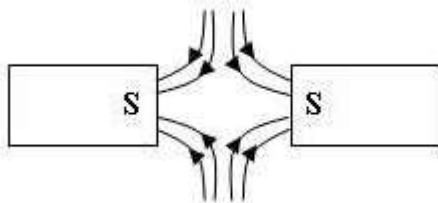
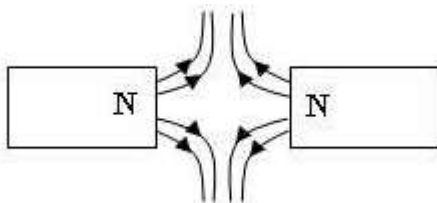
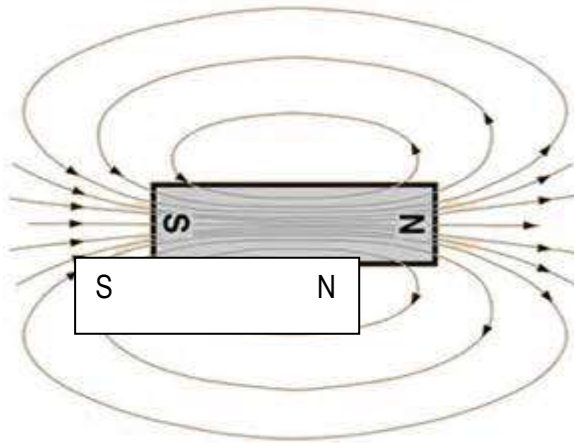


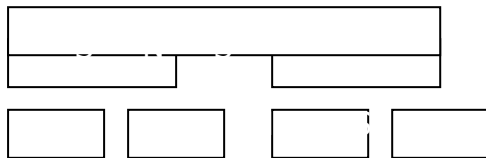
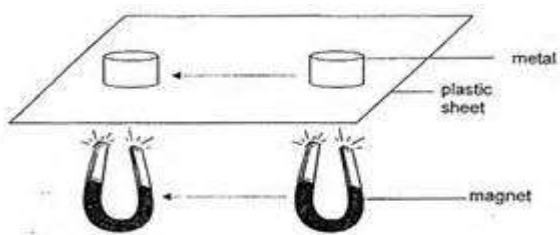
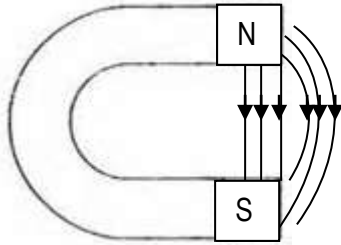
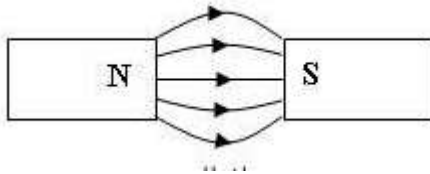


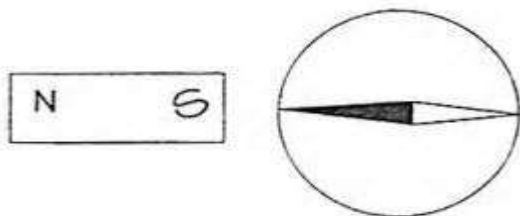
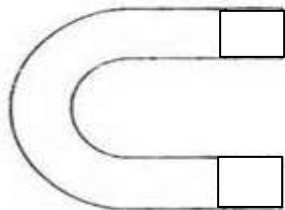
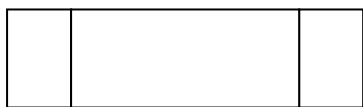


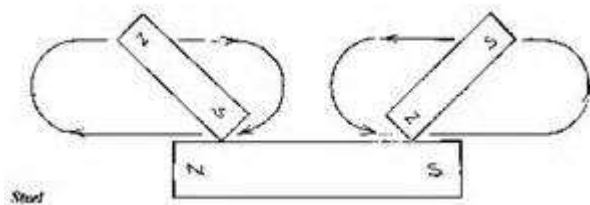
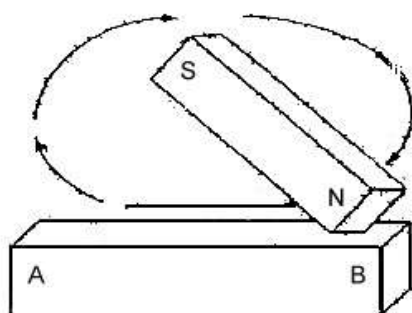


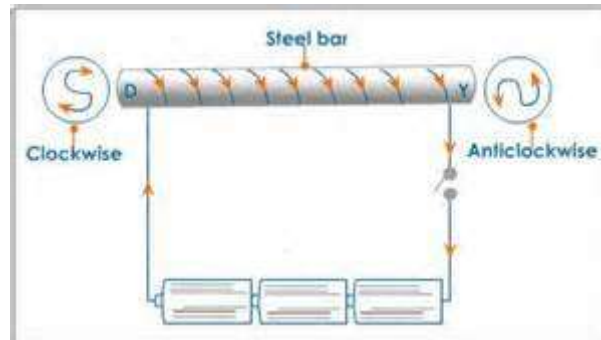
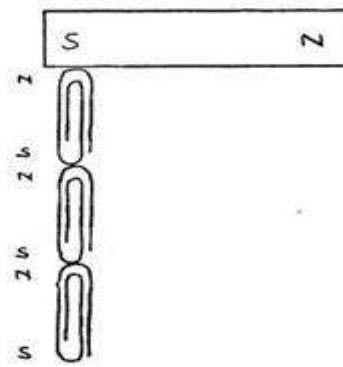


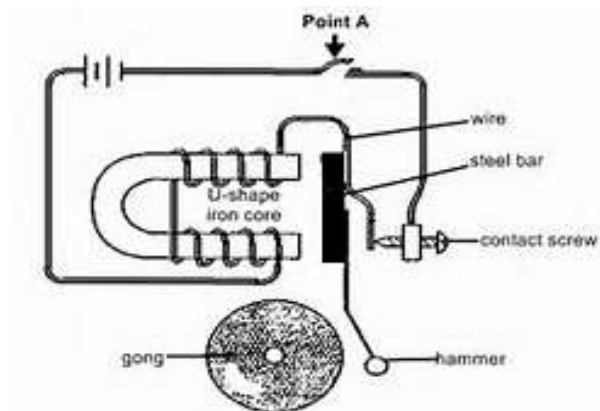




iron paper clips

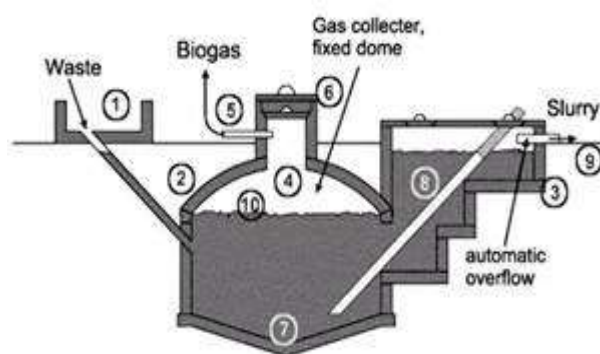






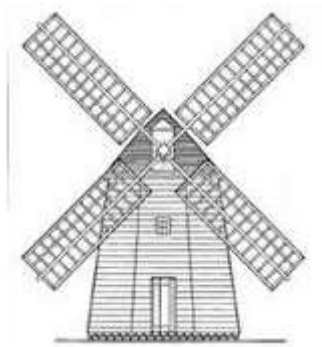












1.

2.

3.



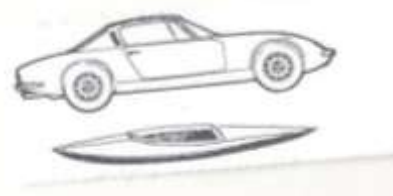
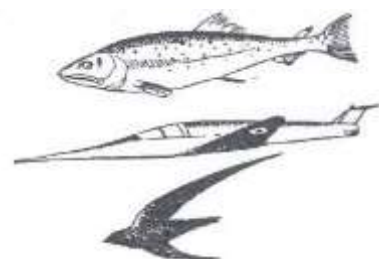
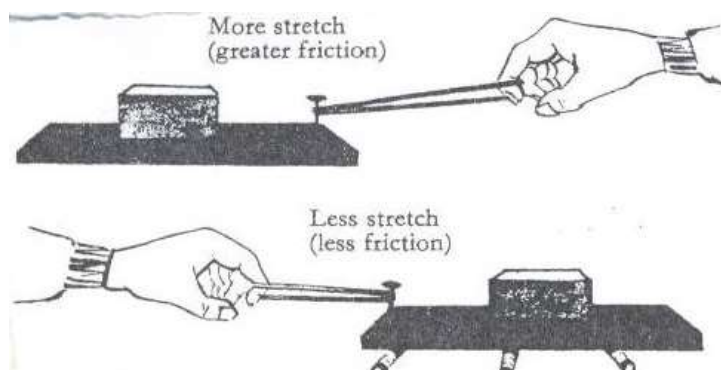
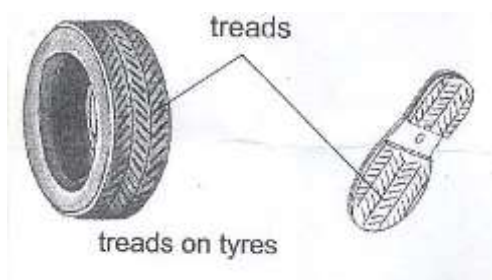


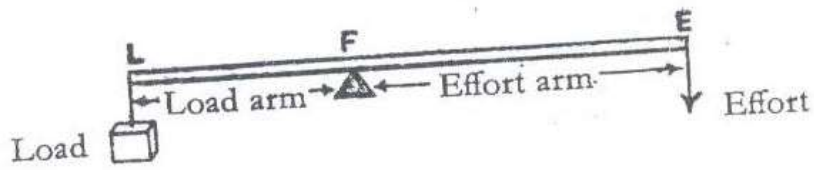


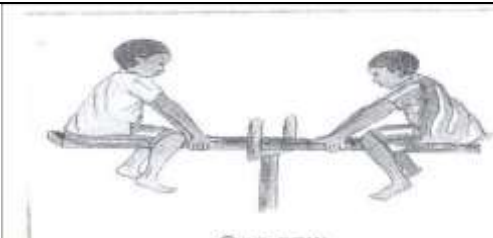
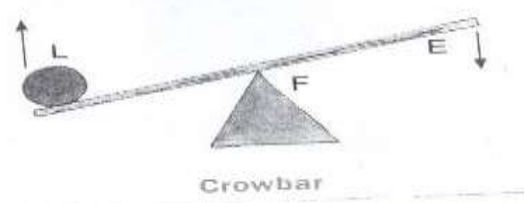
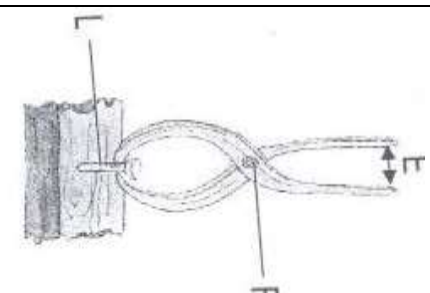
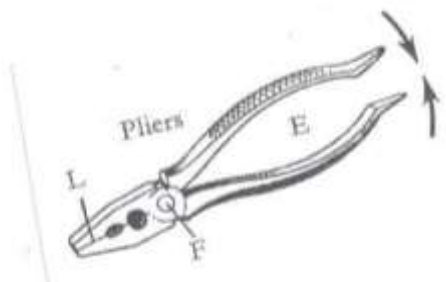


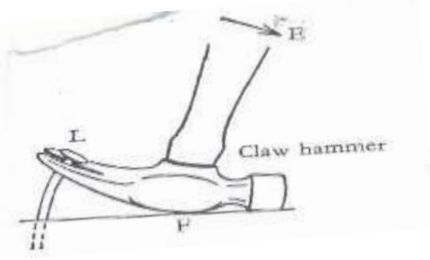
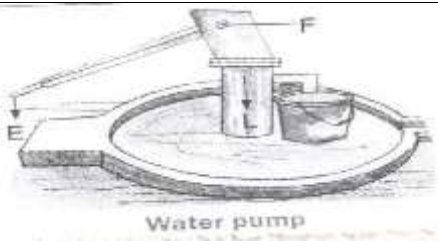
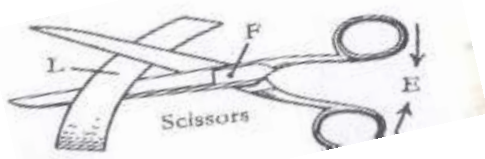

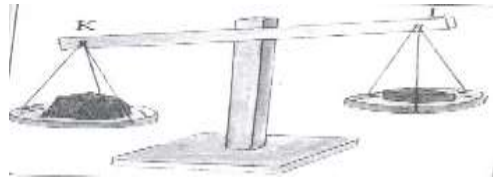


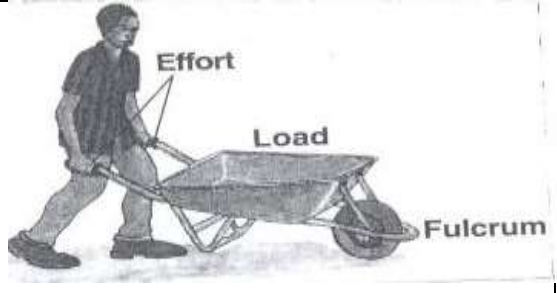
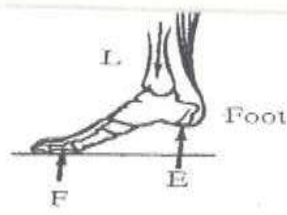


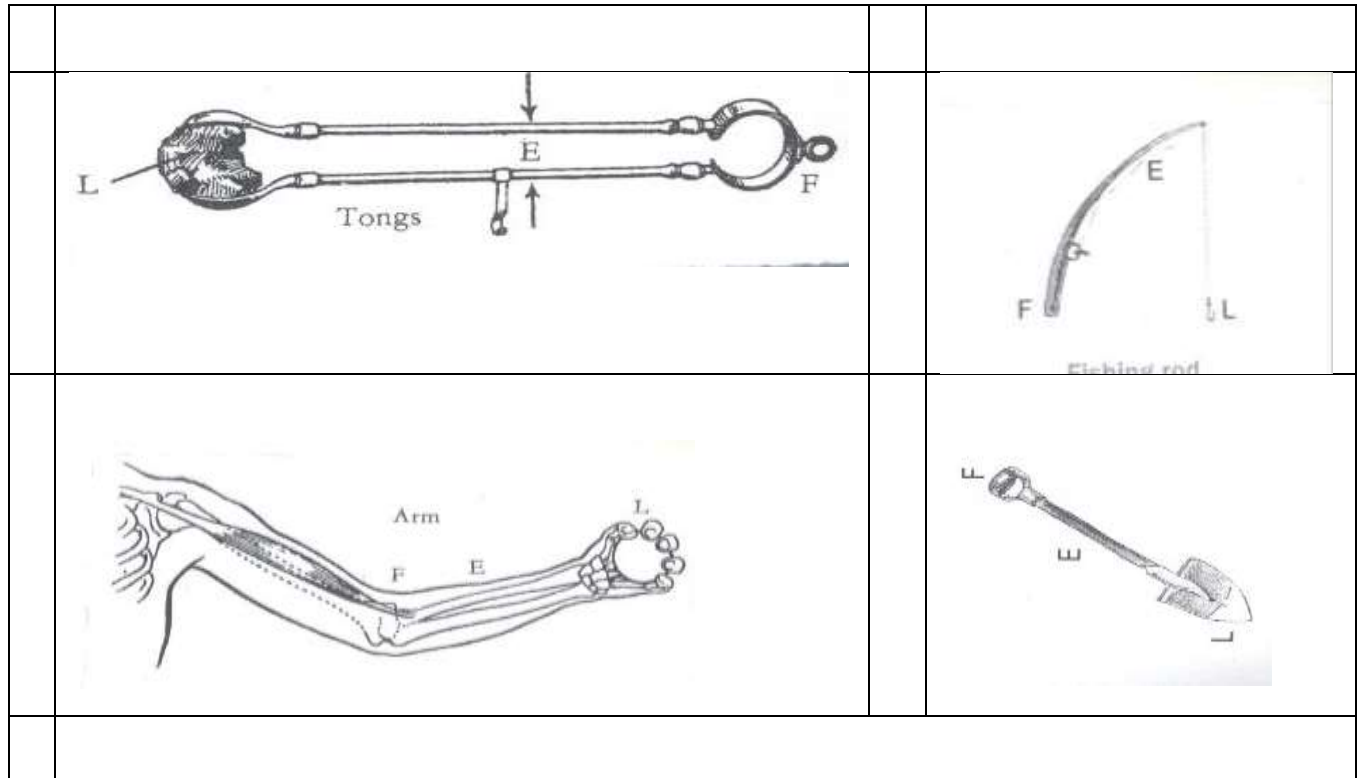
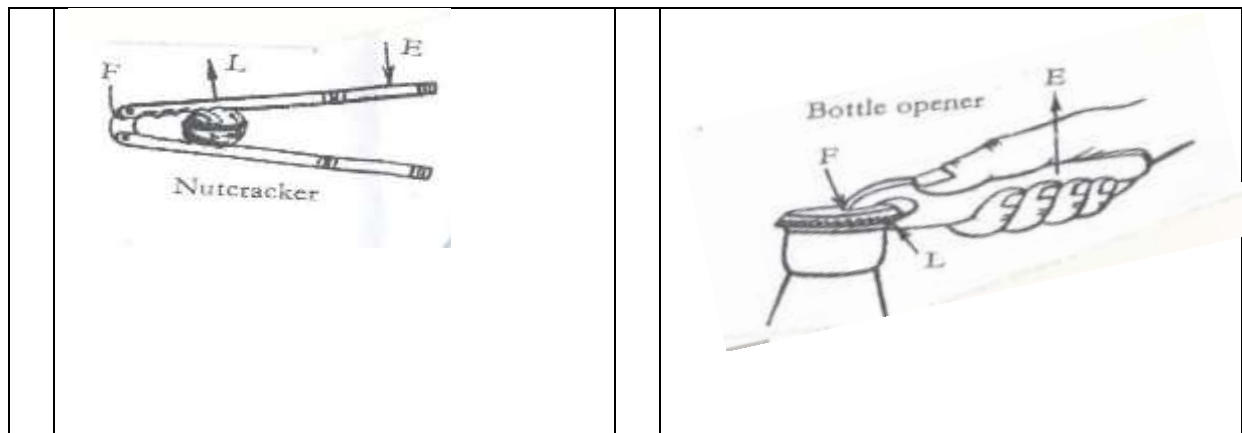


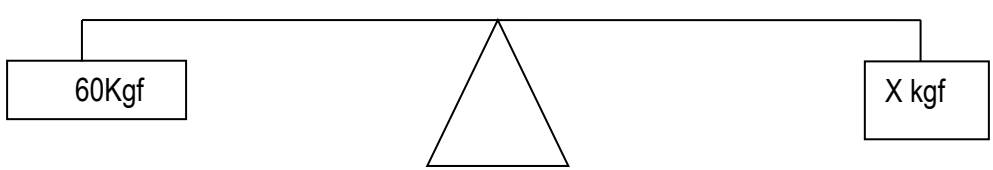
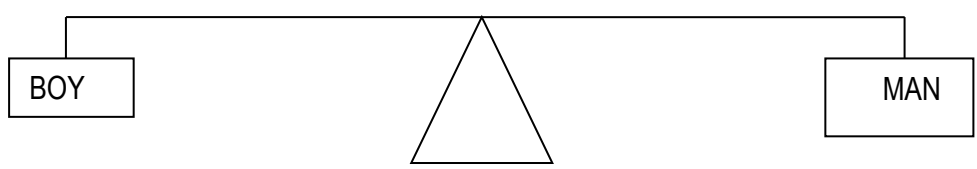
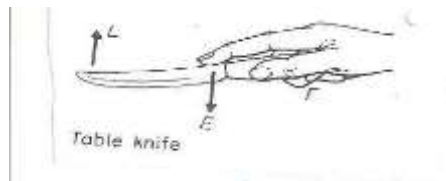
			 Crowbar
			 Pliers

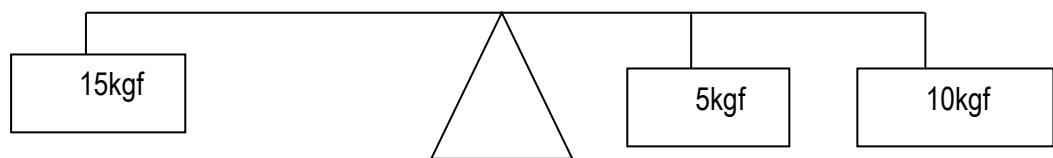
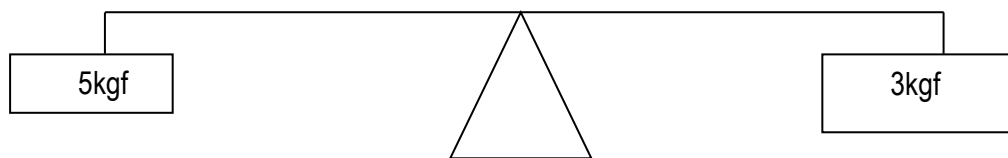
			 Water pump
			
			

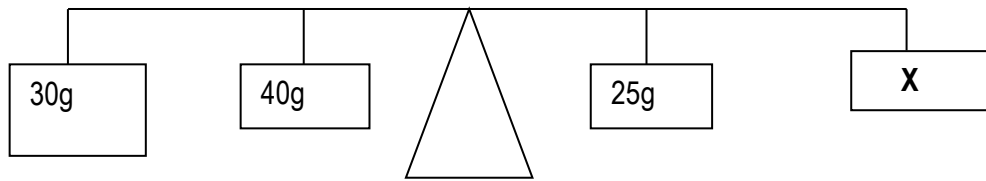
			


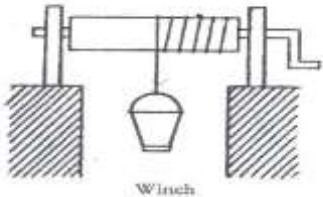
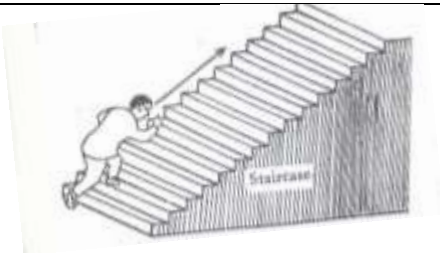



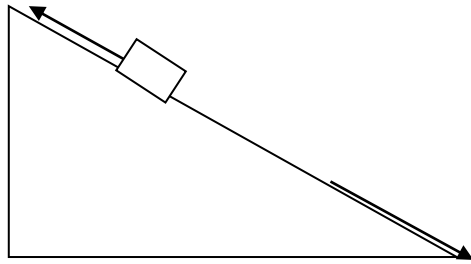


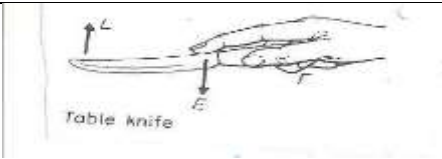
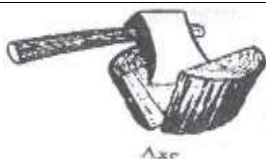


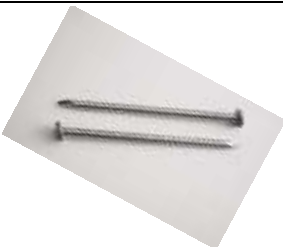

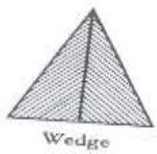








	 <p>Table knife</p>		 <p>Axe</p>
			
			
	 <p>Wedge</p>		

