



EDUCATO
LEARNING STUDIO

SCIENCE

CHAPTER 8: BODY MOVEMENTS



Body Movements

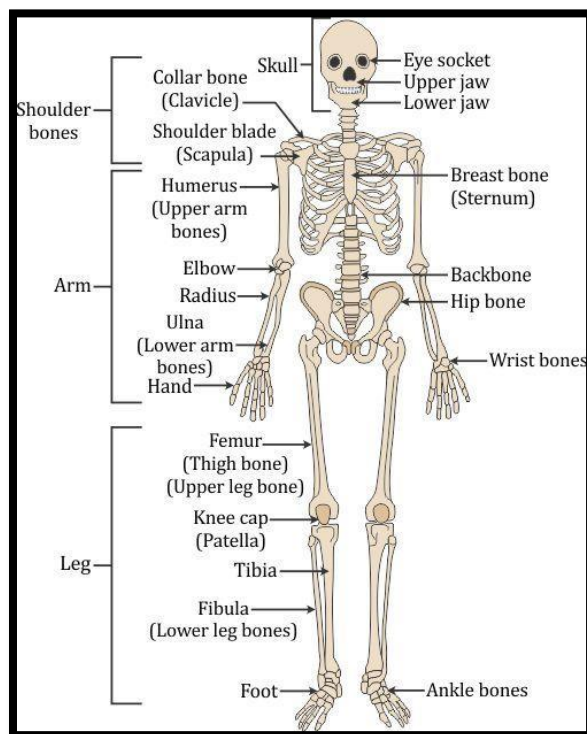


Introduction

- The ability of moving one's body from one place to another is called **locomotion**.
- In nature, the primary reason for movement has been the search of food and shelter, or in saving oneself from harsh climatic conditions or for escaping from being hunted.

Human Skeleton

- All bones in the body form a framework which gives shape to the body. This bony framework inside the body is called the skeleton.
- There are 206 bones in an adult human skeleton.



- Some additional parts of the skeleton are not as hard as bones and can be bent. They are called cartilages.

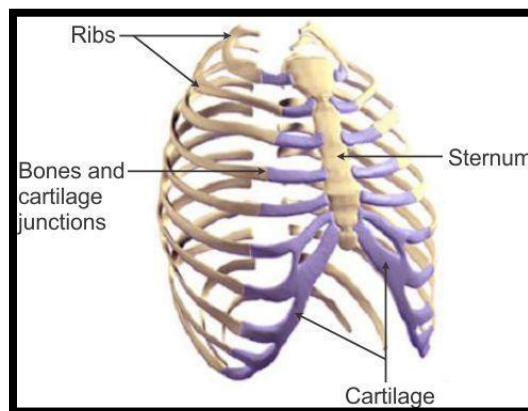
Functions of Skeleton

- It **holds the whole body together** and gives it **shape**.
- It **protects** many **delicate organs** of the body from outside damage.
- It **provides numerous points for attachment** of the muscles of the body.
- It helps in the movement of **body parts** and **locomotion**.
- The human skeleton consists of a strong **backbone** which has a **skull** at its top end.
- The skull is made of many bones joined together. It encloses and protects the most

important part of the body, i.e. the brain.

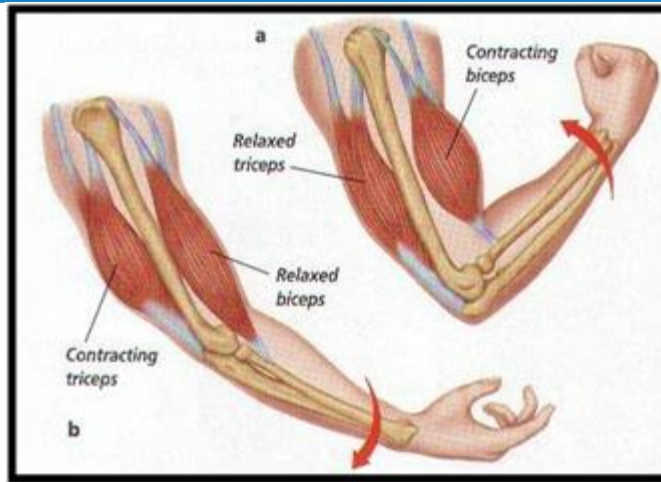


- **Ribs** are attached to the upper part of the backbone forming a **ribcage**.
- The breastbone also known as the **sternum** is present in front of the ribcage.
- Ribcage protects the heart and the lungs.



Muscle Movements

- The muscle is a **fibrous tissue** in the body which has the **ability to contract** when required.
- On contraction, muscles become **shorter, stiffer** and **thicker** because they **pull the bones**.
- Muscles always work in pairs. When one muscle contracts, the bone is pulled in that direction and the other muscle relaxes.
- To move the bone in the opposite direction, the relaxed muscle contracts and brings the bone to its original position, while the first relaxes. A muscle cannot push. It can only pull.



Human Body and its Movement

- The point where two or more bones meet in the body is called a **joint**.
- Bones do not move. It is the joint which helps in movement.

Type of Joint	Features
1. Ball and Socket Joint	<ul style="list-style-type: none"> • The spherical or hemispherical head of one bone fits exactly into a corresponding hollow or socket of the other bone. • Examples: Shoulder and hip joints
2. Hinge Joint	<ul style="list-style-type: none"> • It allows movement in only one direction (to-and-fro motion). • Examples: Knee, elbow joints and finger joints
3. Gliding Joint	<ul style="list-style-type: none"> • The bones glide and slide over one another allowing movement. • Examples: Wrist and ankle joints
4. Pivot Joint	<ul style="list-style-type: none"> • A cylindrical bone turns in a ring-type bone. • It allows rotation about an axis. • Example: The joint between the first and the second vertebrae of the backbone; this allows us to turn our head.

Movement in Animals



Animal	Movement Mechanism
Earthworm	<ul style="list-style-type: none"> • Repeated expansions and contractions of a segment of an earthworm's body along with a slimy substance secreted by the body help the earthworm to move forward. • Under its body, tiny bristles are present; these bristles are connected to the muscles and help in getting a good grip on the ground.
Snail	<ul style="list-style-type: none"> • The snail has only one foot which is large, flat and disc-shaped and made of strong muscles. It is called the muscular foot. • The two sets of muscles present in the foot contract and expand alternately to produce a wave-like movement; a series of such waves help the snail move forward.
Cockroach	<ul style="list-style-type: none"> • Cockroaches walk and fly in the air. • Three pairs of legs help in walking. • Two pairs of wings are attached to the breast. The breast muscles move the wings when the cockroach flies.
Fish	<ul style="list-style-type: none"> • The fish is adapted to move in water with its streamlined shape, flexible backbone, powerful body muscles and fins.
Snakes	<ul style="list-style-type: none"> • Snakes have a long backbone and many thin muscles. • The snake's body curves into many loops; each loop pushes forward by pressing against the ground. • Thus, the snake can move forward very fast but not in a straight line.

Birds

- The body of every bird is adapted for flying.
- Birds fly with a **constant flapping** of their wings.
- The **forelimbs** are modified to form wings.
- Bones are **hollow** and **light**.
- The shoulder bones are strong, and the breastbones are modified to hold muscles of flight.
- Birds such as ducks and swans swim in water by pushing against water with their webbed feet.
- Birds such as kiwi, penguin and ostrich cannot fly. Such birds walk on the ground by using

their hind limbs.

Bones

Bones provide a definite shape to our body. Skeleton is the framework given to our body as a result of the fusion of bones. It is made up of bones, cartilage and joints. One way to know the shape of your bones is through X-ray images. Our hand is made up of small bones called carpals.

Ribs are bent to form the chest bone. The chest bone and backbone together join to form the rib cage. The rib cage consists of 12 ribs on each side of the chest. It protects our internal organs such as the heart, lungs etc.

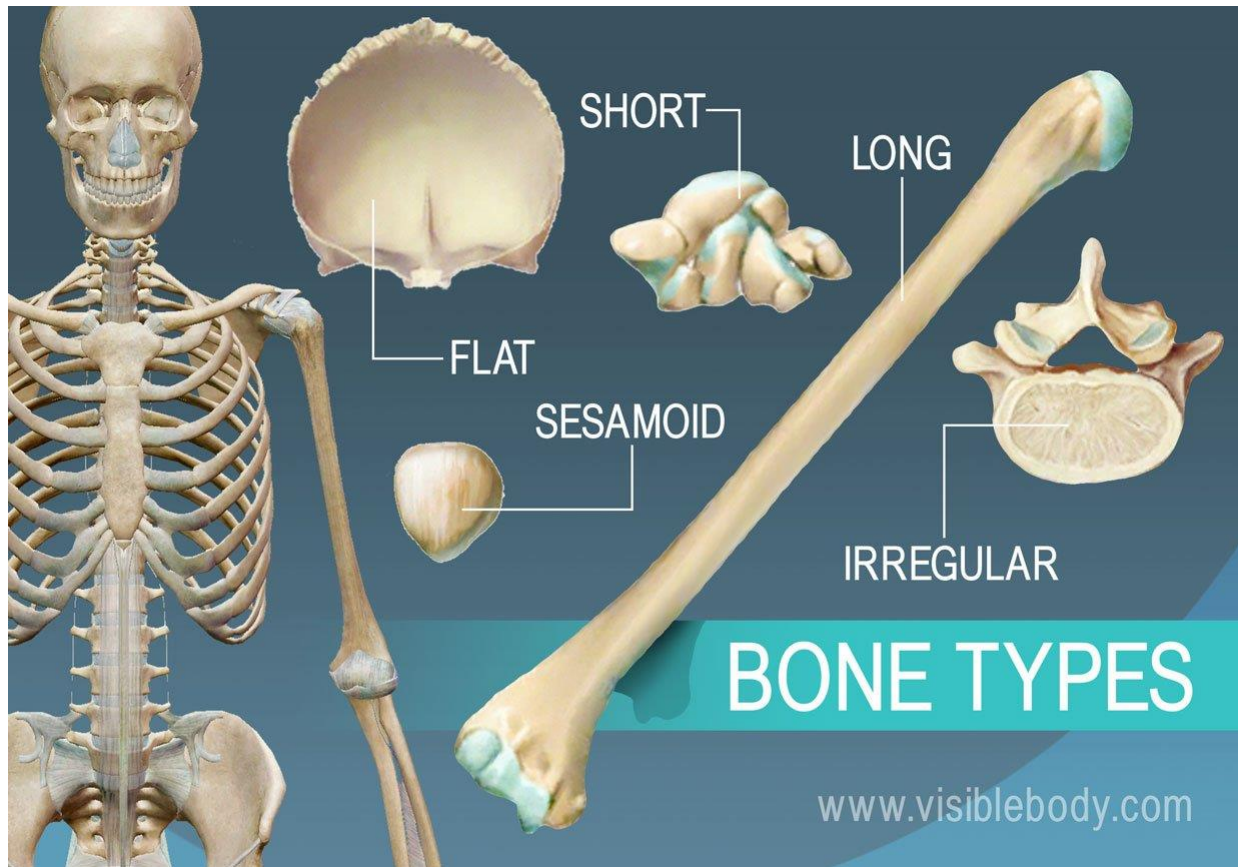
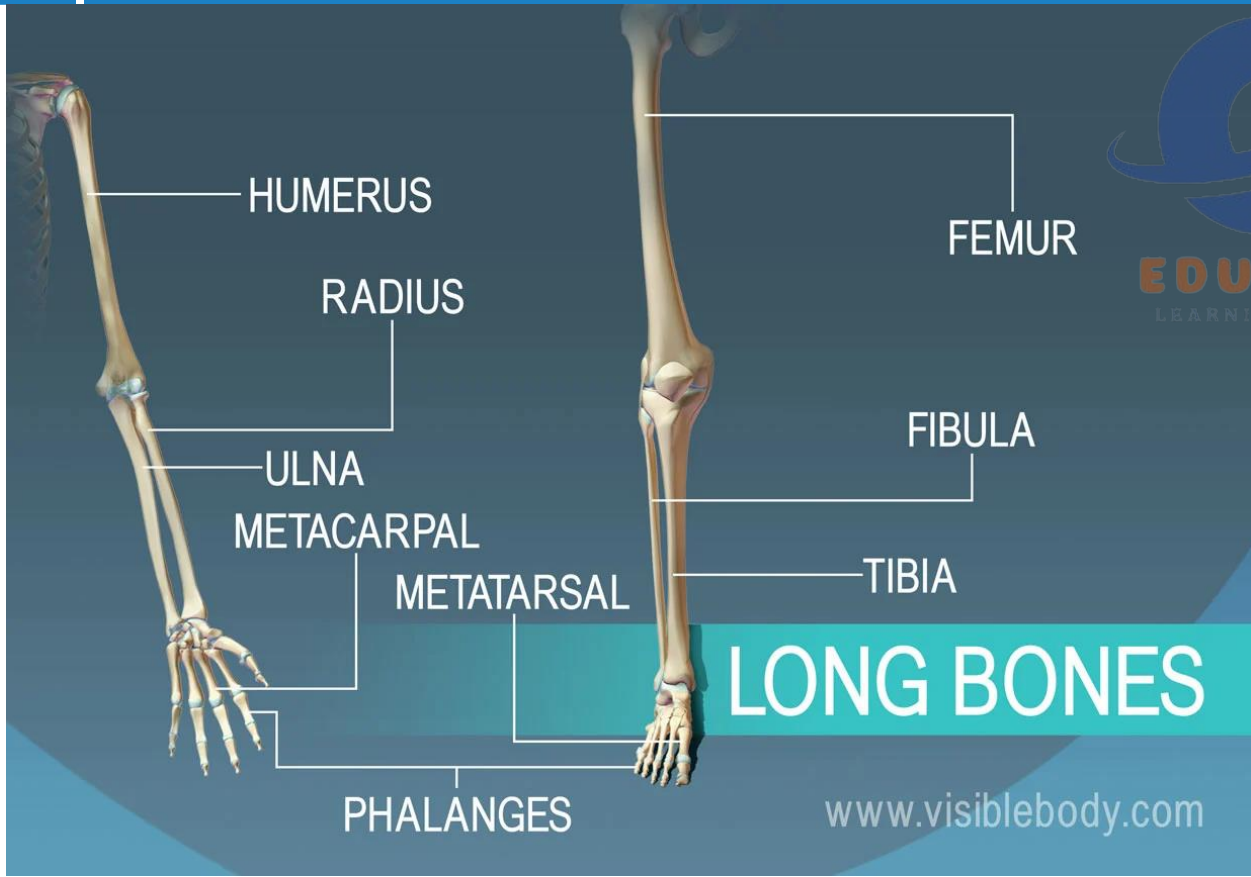
The rib cage is joined to the backbone.

It consists of 33 small bones called vertebrae.

Backbone helps our body stay erect and provides posture.

- Bones near the shoulder area are called shoulder bones and those present in the abdominal region are called pelvic bones, which encloses the portion of our body just below the stomach.
- Skull is joined together by many bones and encloses our brain.
- The additional part of the skeleton that can be bent is called the cartilage. Example: Ear lobe. They are also found in joints.
- Muscles are the flesh on the bone. They bulge due to contraction and becomes shorter, thicker and stiffer. They work in pairs to move a bone. When one muscle contracts to pull a bone in a direction the other muscle relaxes. To move a bone in the opposite direction, relaxed muscle contracts to pull the bone towards the original direction while the first is in a relaxed position.





The human skeleton is made up of 206 bones, including bones of the:

- Skull – including the jawbone

- Spine – cervical, thoracic, and lumbar vertebrae, sacrum and tailbone (coccyx)
- Chest – ribs and breastbone (sternum)
- Arms – shoulder blade (scapula), collar bone (clavicle), humerus, radius and ulna
- Hands – wrist bones (carpals), metacarpals and phalanges
- Pelvis – hip bones
- Legs – thigh bone (femur), kneecap (patella), shin bone (tibia) and fibula
- Feet – tarsals, metatarsals and phalanges.

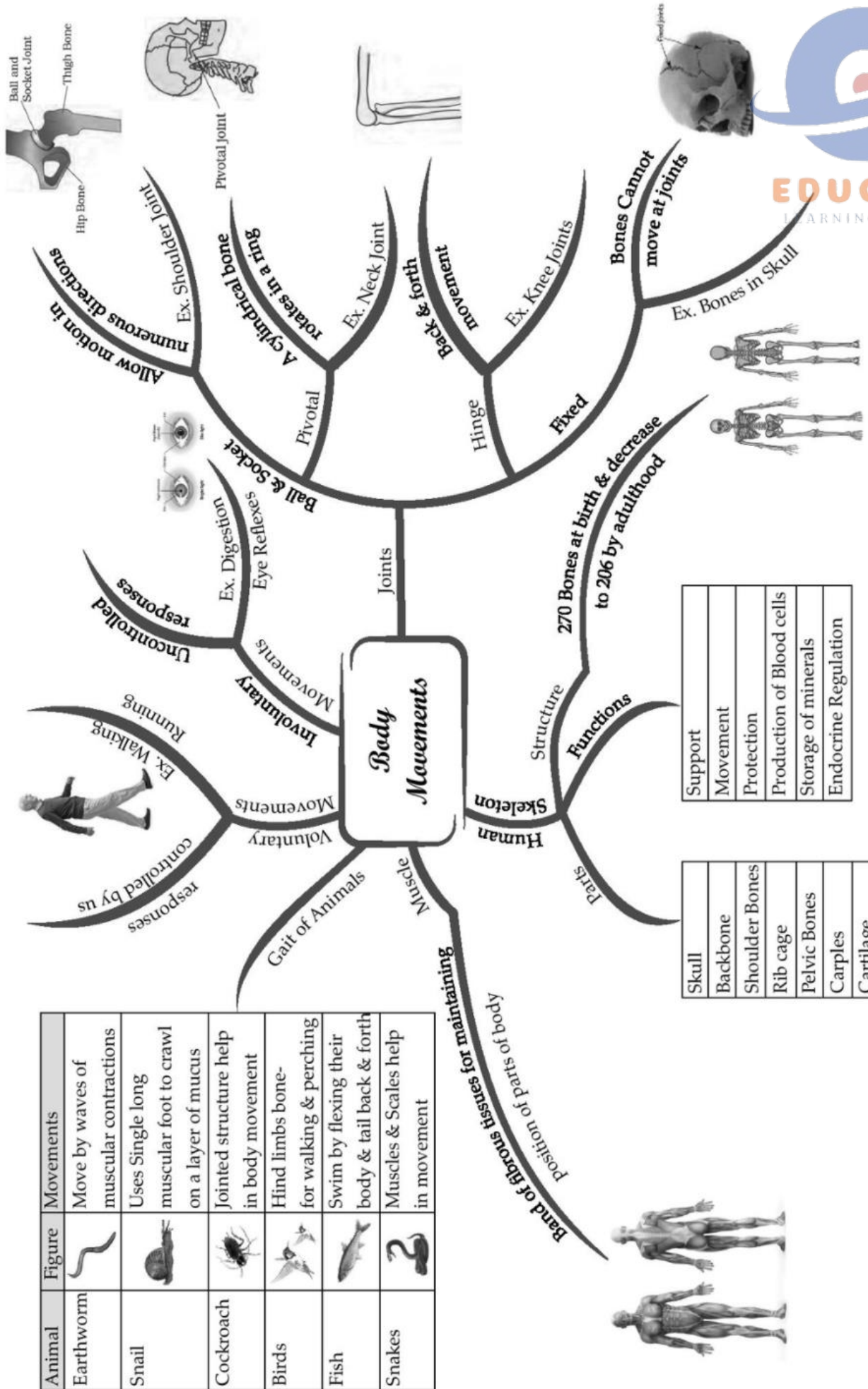


Bone types

There are four different types of bone in the human body:

- **Long bone:** Has a long, thin shape. Examples include the bones of the arms and legs (excluding the wrists, ankles and kneecaps). With the help of muscles, long bones work as levers to permit movement.
- **Short bone:** Has a squat, cubed shape. Examples include the bones that make up the wrists and the ankles.
- **Flat bone:** Has a flattened, broad surface. Examples include ribs, shoulder blades, breastbone and skull bones.
- **Irregular bone:** Has a shape that does not conform to the above three types. Examples include the bones of the spine (vertebrae).

CHAPTER - 8 BODY MOVEMENTS



Animal	Figure	Movements
Earthworm		Move by waves of muscular contractions
Snail		Uses Single long muscular foot to crawl on a layer of mucus
Cockroach		Jointed structure help in body movement
Birds		Hind limbs bone- for walking & perching
Fish		Swim by flexing their body & tail back & forth
Snakes		Muscles & Scales help in movement

Important Questions



Multiple Choice Questions:

Question 1. A snail moves by its muscular

- (a) Wings
- (b) Foot
- (c) Fins
- (d) None of these

Question 2. The muscles covers the.

- (a) Skin
- (b) Bones
- (c) Both (a) and (b)
- (d) None of these

Question 3. The skull covers and protects the

- (a) Eyes
- (b) Nose
- (c) Brain
- (d) None of these

Question 4. To which bones are thigh bones attached ?

- (a) Pelvic bone
- (b) Hinge joint
- (c) Shoulder bone
- (d) Backbone

Question 5. The pelvic bones together with the last two parts of the backbone form a large bony bowl called:

- (a) Thigh bone
- (b) Hip bone
- (c) Knee bone
- (d) Pelvis

Question 6. How is pelvic bone formed ?

- (a) By the fusion of three bones



- (b) By the fusion of two bones
- (c) By the fusion of four bones
- (d) None of these

Question 7. How many shoulder bones are there ?

- (a) One
- (b) Three
- (c) Two
- (d) None of these

Question 8. To which part of the body are the bones of the upper arm attached?

- (a) Elbow
- (b) Palm
- (c) Shoulder
- (d) None of these

Question 9. Which bones are formed by the collar bone and the shoulder blades ?

- (a) Shoulder bone
- (b) Upper arm
- (c) Arm bone
- (d) All of these

Question 10. The chest is a cone shaped cage enclosing the.

- (a) Heart
- (b) Lungs
- (c) Both (a) and (b)
- (d) None of these

Question 11. How many ribs could you count ?

- (a) Seven
- (b) Six
- (c) Ten
- (d) Nine

Question 12. Name two very important organs that are protected by the box made of ribs.

- (a) Heart
- (b) Lungs
- (c) Chest

(d) Both (a) and (b)

Question 13. What is function of small bones of toe ?

(a) Help in walking

(b) Help in running

(c) Help in sitting

(d) both (a) and (b)

Question 14. What is flat foot ?

(a) Foot having bones set in an arch

(b) When the foot is flat instead of being arched

(c) Both (a) and (b)

(d) None of these

Question 15. How many bones make the ankle?

(a) Four

(b) Two

(c) Three

(d) Several

Very Short Question:

1. What do you mean by movement?
2. At which part does the arm rotate?
3. If you tie a scale with your arm, are you able to bend your elbow?
4. Name the places where two parts of the body are seen to be joined together.
5. If there are no joints then will it be possible to move?
6. Can bones be bent?
7. Can we bend our body at every part?
8. How many types of joints are there?
9. Name the various types of joint.
10. What is cavity in bone?

Short Questions:

1. What are joints? Write the names of various types of joints.
2. What is skeleton? Draw a diagram to show the human skeleton.
3. Write two ways by which we may know the shape of human skeleton.
4. Write the differences between bones and cartilage.





5. How do the muscles work?
6. How does the earthworm move?
7. How does the snail move?
8. How does fish move in water?

Long Questions:

1. Explain various kinds of joints found in our body and give example of each.

Answer Key-

Multiple Choice Answers:

1. (b) Foot
2. (b) Bones
3. (c) Brain
4. (a) Pelvic bone
5. (d) Pelvis
6. (a) By the fusion of three bones
7. (c) Two
8. (c) Shoulder
9. (a) Shoulder bone
10. (c) Both (a) and (b)
11. (d) Nine
12. (d) Both (a) and (b)
13. (d) both (a) and (b)
14. (b) When the foot is flat instead of being arched
15. (d) Several

Very Short Answers:

1. Answer: The changing position of the body or any part of the body is called movement.
2. Answer: The arm rotates on the round pit-like structure.
3. Answer: No, we cannot bend our elbow.
4. Answer: These places are called joint.
5. Answer: No, it is not possible.
6. Answer: No, bones cannot be bent.
7. Answer: No, we can bend our body only at joints.

8. Answer: There are five types of joints in our body.

9. Answer:

- (i) Ball and socket joints
- (ii) Pivotal joints
- (iii) Hinge joints
- (iv) Fixed joints
- (v) Gliding joints

10. Answer: The hollow space in the bone is called cavity.

Short Answer:

1. Answer: The places where two parts of the body seem to be joined together are called joints. There are following types of joints:
 - a. Ball and socket joints
 - b. Pivotal joints
 - c. Hinge joints
 - d. Fixed joints
 - e. Gliding joints
2. Answer: The bones in our body form a framework to give a shape to the body. The framework is called skeleton.



Human Skeleton Front View



3. Answer:

- (i) We can know the shape of skeleton by feeling.
- (ii) We could know the shape by X-ray images of human body

4. Answer:

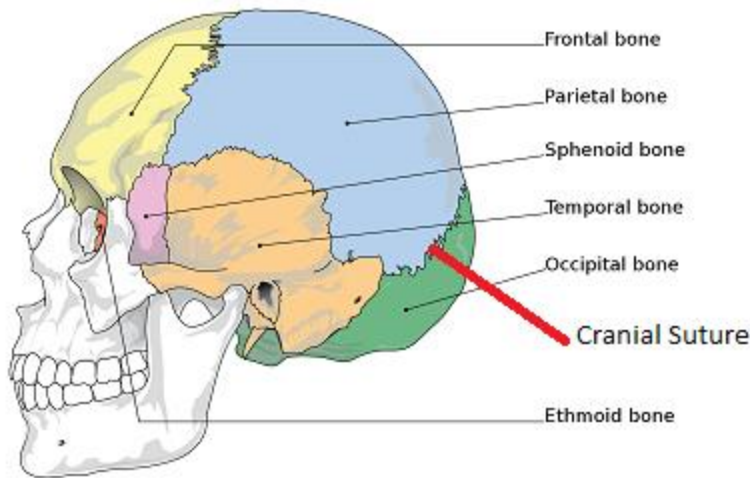
Bone	Cartilage
(i) They are hard.	(i) They are soft.
(ii) They cannot bend.	(ii) They can bend.
(iii) They are used to make the framework of whole body.	(iii) They help to make some parts of the body.

5. Answer: The muscles work in pairs. When one of them contracts, the bone is pulled in that direction, the other muscle of the pair relaxes. To move the bone in the opposite direction, the relaxed muscle contracts to pull the bone towards its original position, while the first relaxes. A muscle can only pull. It cannot push.
6. Answer: Earthworm does not have bones. It has muscles. During the movement, earthworm first extends front part of the body keeping the rear portion fixed to the ground. Then it fixes the front and releases the rear end. It then shortens the body and pulls the rear end forward. In this way by repeating such muscular expansions and contractions earthworm moves.
7. Answer: The rounded structure on the back of the snail is called shell. It is the outer skeleton (exoskeleton) of snail. When it starts moving a thick structure and the head of the snail may come out of an opening in the shell. The thick structure is called foot, which is made up of strong muscles. It helps snail in moving.
8. Answer: The body of fish is streamlined. The streamlined shape helps the fish to move in water. The skeleton of fish is covered with muscles which make the front part of the body to curve to one side and the tail part swings towards the opposite side. This makes a jerk and pushes the body forward. In this way it moves in water.

Long Answer:

1. Answer: There are five types of joints in our body:

- (i) Fixed joints: Those joints which do not allow movement are called fixed joint.



(ii) Ball and socket joint: This joint allows movement in all directions. The rounded end of one bone fits into the hollow space of other bone. For example, joint between upper arm and shoulder.



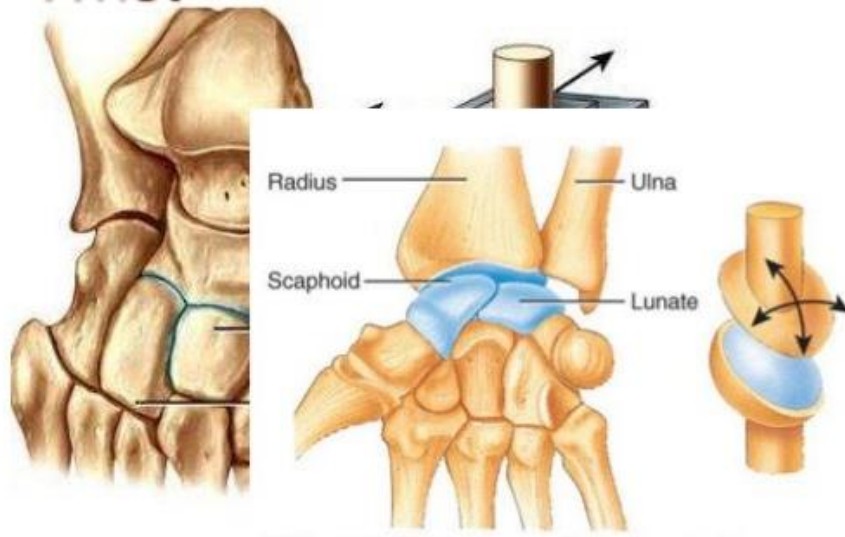
(iii) Pivotal joint: This type of joint allow movement in all planes, i.e. up and down, side and other planes. For example, head.

(iv) Hinge joint: The joint which allows movement only in one plane is called hinge joint. For example, fingers, knees.



(v) Gliding joint: These joints allow only a limited amount of movement of sliding nature of cartilage. For example, the joints of backbone.

Gliding Joints: Ankle and Wrist



(d) Condyloid joint between radius and scaphoid and lunate bones of the carpus (wrist)