8 Body Movements

Lesson at a Glance

- **Cell:** Cell is the structural and functional unit of all living organisms.
- **Tissue:** A group of similar cells with same kind of function is called a *tissue.*
- **Muscles:** Muscular tissue consists of elongated cells called *muscle fibres.* Muscles contain special proteins called *contractile proteins,* which contract and relex to support movements.
- **Bone:** It is a strong and non-flexible tissue. It forms the framework that supports the body. It also anchors the muscles.
- **Cartilage:** It is a solid but semi-rigid and flexible tissue. Cartilage smoothens bone surfaces at joints. It also helps in forming the framework of the body called skeleton. It is present in the nose, ear, trachea and larynx.
- **Skeleton:** A hard internal or external framework of bones, cartilage, shells, woody fibre, supporting the body of an organism is called *skeleton.*
- The skeleton is of the following types:
  - (*i*) The skeleton, if it covers the body from the outside, or is situated in the skin, is known as **exoskeleton**. For example, insects have skeleton made of *cuticle.* Scales, feather, hairs, horns, nails and hoofs are also included under the exoskeleton.
  - (*ii*) The skeleton, if it lies inside the body and is covered by soft parts like flesh, is known as **endoskeleton**. Endoskeleton in higher animals (animals which have vertebral column) is made of *living bones* and *cartilages.* For example, endoskeleton in humans, elephant, dog etc.

- **Functions of Skeletal system**

It performs the following functions:

(*i*) It forms the framework of the body and also provides shape and posture to the body.

(*ii*) It affords protection to the delicate parts of the body against mechanical injury.

(*iii*) It serves as a storage centre for calcium and phosphate.

(*iv*) It participates in movements and locomotion.

(*v*) The bone marrow of long bones serves as a centre for the production of erythrocytes.

(*vi*) It provides rigid surface for the attachment of muscles.

(*vii*) The movements of ribs and sternum help in breathing and ear ossicles help in hearing.

- The bones are connected to muscles with the help of the connective tissues called *tendons*. The bones are connected to each other at the joints with the help of the *ligaments*. Bones are able to move easily because the ligaments are elastic and can stretch easily.
- Muscles work in pairs. When one of them contracts it bulges and 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 one relaxes.

A muscle can pull. It cannot push a bone.

For example, contraction of muscles lifts the arm whereas contraction of the other muscles called other muscles of the pair pull the arm to its orginal position.

- **Joint:** The place where two or more bones meet together is called a *joint*.
- **Fixed Joint:** The joint which do not allow movements is called *fixed joint*.
- **Synovial Joint:** Freely movable joints are also called *synovial joints* or *perfect joints* because they allow free movement in one or more directions.

- **Ball and Socket Joint:** The joint which allows movement in all directions is called *ball and socket joint*. For example, joint between upper arm and shoulder.
- **Pivotal Joint:** The joint which allows movement in many planes is called *pivotal joint*. For example, skull makes such joint with the first two vertebrae.
- **Hinge Joint:** The joint which allows movement only in one direction is called *hinge joint*. For example, fingers.
- **Rib Cage:** 12 pairs of ribs along with backbone make a cone-shaped cage which protects the lungs and heart is called *rib cage*.

  The ribs are curiously bent. They join the chest-bone (*sternum*) and the backbone together to form the *rib cage*. The last two pairs of ribs (11th and 12th) end freely hence called as *floating ribs*.
- **Backbone:** *Vertebral column* or *backbone* is slightly curved and slightly movable string of ring-shaped bones or *vertebrae*.

  Vertebrae are 33 in number.
- **Streamlined:** A body tapering at both the ends is called *streamlined*.
- **Shoulder Bone:** The shoulder bone is formed by the collar bone and shoulder blade. It forms *pectoral girdle*. Collar bone is also called *clavical*.
- **Pelvic Bones:** The structure on which our body rests is made of *pelvic bones*.

  Pelvic bones hold various organs in the portion of your body below the stomach. This is the part you sit on.
- **Cavity:** Hollow space.
- **Gait:** Gait means the manner of forward motion.
- **Bristles:** Short, stiff hair of animals.

TEXTBOOK QUESTIONS SOLVED

Q.1. *Fill in the blanks:*

(*a*) *Joints of the bones help in the* _____ *of the body.*

(*b*) *A combination of bones and cartilages forms the* _____ *of the body.*

(c) *The bones at the elbow are joined by a _____ joint.*

(d) *The contraction of the _____ pulls the bones during movement.*

Ans. (a) movement (b) skeleton

(c) hinge (d) muscle

Q.2. *Indicate 'true' and 'false' among the following sentences:*

(a) *The movement and locomotion of all animals is exactly the same.*

(b) *The cartilages are harder than bones.*

(c) *The finger bones do not have joints.*

(d) *The fore arm has two bones.*

(e) *Cockroaches have an outer skeleton.*

Ans. (a) False (b) False (c) False

(d) True (e) True

Q.3. *Match the items in column I with one or more items of column II:*

Column I	*Column II*
(i) *Upper jaw*	(a) *have fins on the body*
(ii) *Fish*	(b) *has an outer skeleton*
(iii) *Ribs*	(c) *can fly in the air*
(iv) *Snail*	(d) *is an immovable joint*
(v) *Cockroach*	(e) *protect the heart*
	(f) *shows very slow movement*
	(g) *have a streamlined body*

Ans.

Column I	*Column II*
(i) Upper jaw	(d) is an immovable joint
(ii) Fish	(a) have fins on the body, and (g) have a streamlined body
(iii) Ribs	(e) protect the heart
(iv) Snail	(b) has an outer skeleton, and (f) shows very slow movement
(v) Cockroach	(c) can fly in the air, and (b) has an outer skeleton

Q.4. *Answer the following questions:*

(a) *What is a ball and socket joint?*

(b) *Which of the skull bones are movable?*

(c) *Why can our elbow not move backwards?*

Ans. (a) The rounded end of one bone fits into the hollow space of other bone. This is called ball and socket joint. Ball and socket joints allow movements in all the directions, e.g. shoulder and hip can be moved in all directions.

(b) In skull, only lower jaw is movable.

(c) Our elbow cannot move backwards because the elbow has a hinge joint that allows movement in only one direction.