

**SCIENCE**

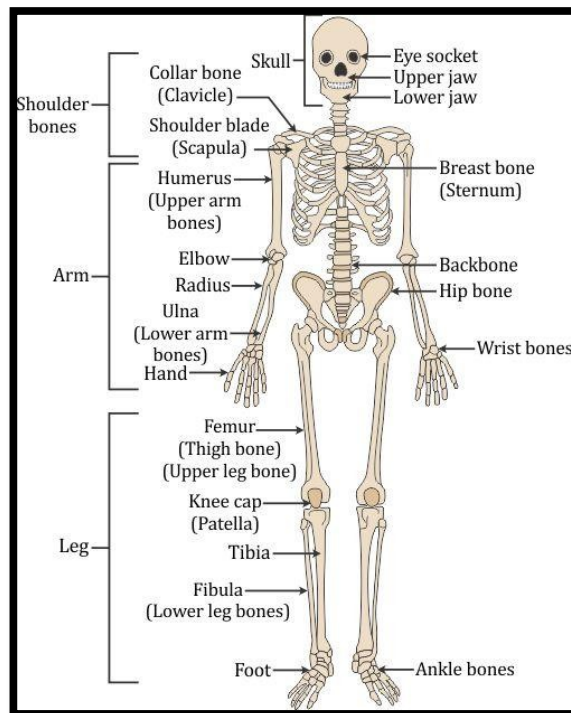
## Body Movements

### 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.



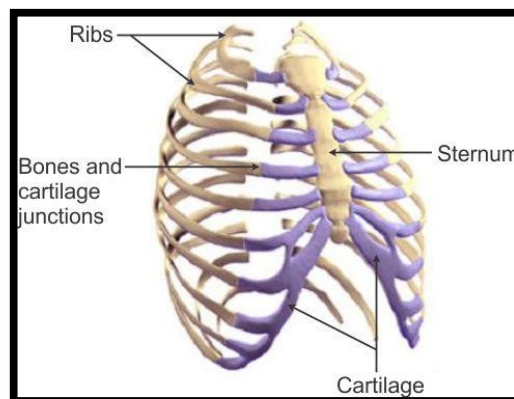
- Some additional parts of the skeleton are not as hard as bones and can be bent. They are called **cartilages**.

## 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**.

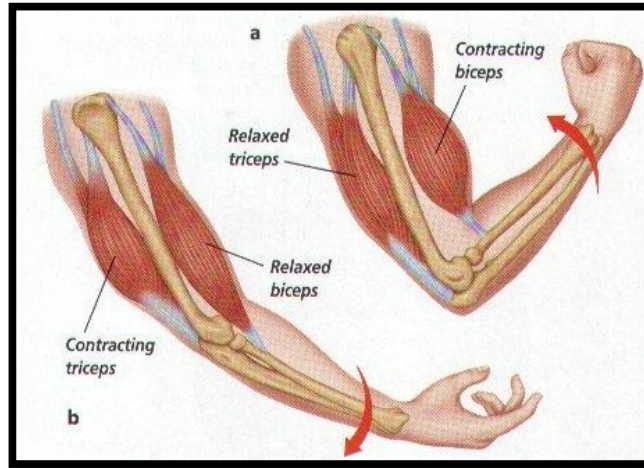


- **Ribs** are attached to the upper part of the backbone forming a **ribcage**.
- The breastbone also known as the **sternum** is present in front of the **ribcage**.
- Ribcage protects the heart and the **lungs**.



## 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
<b>1. Ball and Socket Joint</b>	<ul style="list-style-type: none"> <li>• The <b>spherical</b> or hemispherical <b>head</b> of one bone <b>fits exactly</b> into a <b>corresponding hollow</b> or socket of the other bone.</li> <li>• Examples: Shoulder and hip joints</li> </ul>
<b>2. Hinge Joint</b>	<ul style="list-style-type: none"> <li>• It allows <b>movement in only one direction</b> (to-and-fro motion).</li> <li>• Examples: Knee, elbow joints and finger joints</li> </ul>
<b>3. Gliding Joint</b>	<ul style="list-style-type: none"> <li>• The <b>bones glide and slide over one another</b> allowing movement.</li> <li>• Examples: Wrist and ankle joints</li> </ul>
<b>4. Pivot Joint</b>	<ul style="list-style-type: none"> <li>• A cylindrical bone turns in a ring-type bone.</li> <li>• It allows <b>rotation about an axis</b>.</li> <li>• Example: The joint between the first and the second vertebrae of the backbone; this allows us to turn our head.</li> </ul>
<b>5. Fixed Joint</b>	<ul style="list-style-type: none"> <li>• The joints at which the bones <b>cannot move</b> are termed as <b>fixed joints</b>.</li> <li>• Its function is to provide strength and support to the body, or to protect delicate organs.</li> <li>• Examples: The joint between the upper jaw and the rest of the head; the hip bone is connected to the backbone by a fixed joint.</li> </ul>

## Movement in Animals

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

### 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 breast bones are modified to hold muscles off 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.