

Body Movements

8

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- Structure of bones
- Muscles
- Gait of animals

HUMAN BODY AND ITS MOVEMENTS

Let us look closely at some of our own movements to begin with before looking at all these varieties of movements in animals.

Do you enjoy doing physical exercise at school ? How do you move your hands and legs while doing different exercise ?

Suppose you bowl an imaginary ball at an imaginary wicket. How did you move your arm ? Did you rotate it at the shoulder in a circular movement? Did your shoulder moved in a circular motion ? Lie down and rotate your leg at the hip. Bend your arm at the elbow and the leg at the knee. Stretch your arm sideways. Bend your arm to touch your shoulder with your fingers. Which part of your arm did you bend ? Straighten your arm and try to bend it downwards. Are you able to move the various parts of your body. Record their movements in the following table :

MOVEMENTS IN OUR BODY

Body Part	Movement				
	Rotates completely	Rotates Partly/ turns	Bends	Lifts	Does not move at all
Neck					
Wrist					
Finger					
Knee					
Ankle					
Toe					
Back					

Our body has many separate bones that are joined together at places called joints.

Our body has five kinds of joints :

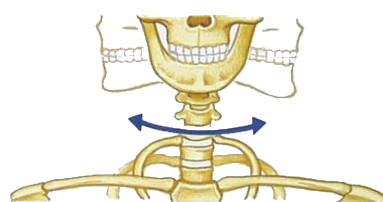
1. Ball and socket joints
2. Pivot joint
3. Hinge joints
4. Fixed joints
5. Gliding joints

1. Ball and Socket Joints

They are found in shoulders and hips. You are able to swing your arms like a wheel because the head of the upper arm bone is like a ball fitted into a cavity of the shoulder. Swinging, rotating, spinning and bowling are the possible movements of these joints.



Ball and socket joint



Pivot joint

2. Pivot Joints

It is found between the skull and first two bones of the backbone which facilitate the rotatory movement. We can turn our head from one side to the other and move our head up and down due to pivot joint.

3. Hinge Joints

The elbow, knee and finger joints allow movement in one plane only, up and down or backward and forward, like the hinge of door. Such joints are therefore called hinge joints.



Hinge joint



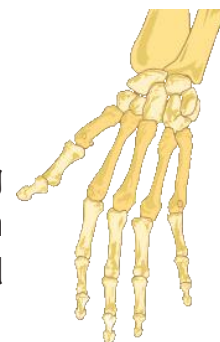
Fixed joint

4. Fixed Joints

There are some bones in our head that are joined together at some joints. The bones cannot move at their joints. Such joints are called fixed joints.

5. Gliding Joints

The backbone, ankle and wrist which allow gliding movements are called gliding joints. They allow only a slight movement. We are able to play, dance, twist, turn and handle things due to gliding or sliding movements of the bones of ankle and wrist.



Gliding joint

STRUCTURE OF BONES

Human body has a bony framework, the skeleton, which is made of 206 bones. Bones are the hard structures made of living cells and minerals. There are total of 206 bones in our skeleton.

We can classify bones into four major groups : Skull bones, spine bone, trunk bones and limb bones.

1. Skull Bones

Our head has skull bones. The skull is made of several bones. Twenty one bones make up the skull. These are the hardest bones in our body. Some of these form the cranium or the cover of the brain. The rest are the facial bones, which give shape to the face. Two hollows or sockets, formed by the facial bones protect the eyes.



Skull bones

2. Spine Bones (Back Bones)

It is also called vertebral column. The spine consists of 33 small bones known as vertebra. The vertebral are hollow at the centre and are joined together to form a tube through which runs the spinal cord.



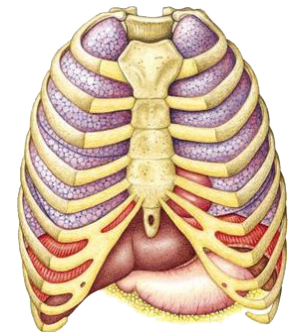
Back bone

Do You Know ?

The longest bone of our body is femur. It is called the Thigh bone also. The smallest bone is located in our internal ear.

3. The Trunk Bones

There are twelve pairs of long curved bones called ribs. They form the rib cage. All the twelve pairs of ribs are joined to the backbone at its back. The first ten pairs of ribs are joined to the chest bone in front. These are called true ribs. The last two pairs of ribs are free at the front end and are known as floating ribs. The rib cage protects delicate and important organs like the heart and the lungs.



Rib cage

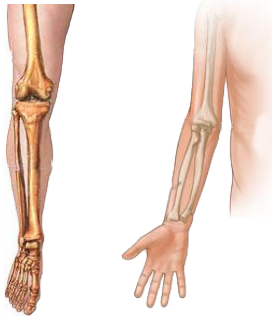
4. Limb Bones

Make your friend stand with his hands pressed to a wall. Ask him to try to push the wall. Do you see two bones standing where his shoulders are ? They are called shoulder bones.

Each hip bone is formed by three bones fused together. The two hip bones are joined to the five fused vertebral in the hip region. The two hip bones are referred to as the pelvis and together with the vertebral they are joined to form the pelvic girdle. The bones fit into depressions or sockets things in the hip bones. The pelvis or rather the pelvic girdle help us to walk run, stand and sit. It supports the weight of the body when we stand or sit and transmits the movement of the legs to the whole body. There are some additional parts of the skeleton that are not as hard as the bones and which can be bent. These are called cartilage.

Do You Know ?

Normal foot is identified by an arch. The foot gives support to the body and helps the body to rest on it. we walk, run, jump and jog with the help of our feet. All normal foot is identified by a flat impression.



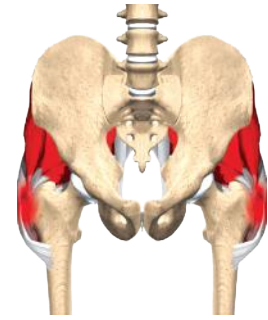
Leg and hand bones



Palm bones



Shoulder bones



Hip bones

MUSCLES

The soft fleshy portion of our body is called muscle. These are about 600 different muscles in our body. All flesh in our body is made up of muscles. The muscles are attached to bones with the help of tendons. The muscles are elastic in nature. They have a very important property of contract ability. They contract and relax when they work. When the muscles contract they draw the bones closer. So the muscles help in the movement of the body.

Movement of bones take place at joints of the bones. Each movable joint has two sets of muscles, one to pull the bones up and the other to pull the bones back. For example the bicep muscles above the arm bones raise the arm. The tricep muscles below the arm bones lower the arm.



Muscular system

GAIT OF ANIMALS

An important differences between plant and animals is their ability to move. Animals seem to be alive to us because they can move from one place to another place.

Earthworm

If you look closely at the ground, you can easily see where earth worms have passed by. As they tunnel through the earth, these worms swallow soil and dead plants. The plants are the earthworm's food. The soil passes through the earthworm's body and is pushed out of the other end in little corks crew – shaped piles called worm casts.

Earthworms are very useful animals. The tunnels they make allow air to reach the roots of plants and this helps the plants to grow. Earthworms drag leaves into their tunnels to eat them. The bits of leaves that the earthworm leaves behind them root or decay.



Snail

Collect a snail from a garden. Have you seen the rounded structure it carries on its back ? This is called the shell and it is the outer skeleton of



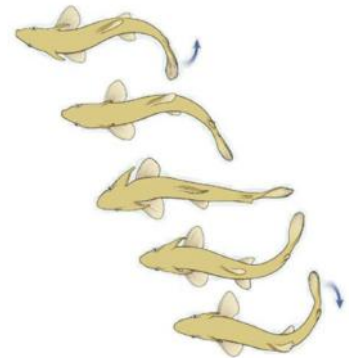
the snail, but is not made of bones. The shell is a single unit and does not help in moving from place to place. It has to be dragged along.

Place the snail on a glass plate and watch it. When it starts moving, carefully lift the glass plate along with the snail over your head. Observe its movements from beneath.

A thick structure and the head of the snail may come out of an opening in the snail. The thick structure is its foot, made of strong muscles. Now, carefully tilt the glass plate. The wavy motion of the foot can be seen is the movement of a snail slow or fast as compared to an earthworm ?

Fish

The streamlined shape of fish help them overcome the friction of water to move fast as streamlined body offers minimums resistance while swimming. The head and tail of the fish are smaller than the middle portion of the body. The body tapers at both ends. This body shape is called streamlined. The shape is such that water can flow around it easily and allow the fish to move in water.



Movement of fish

Snake

Snakes have a long backbone. They have many thin muscles. They are connected to each other even though they are far from one another. They are also interconnected to the backbone, ribs and skin. The snake's body curves into many loops. Each loop of the snake gives it a forward push by processing against the ground. Since its long body makes many loops each loop of the snake gives it a forward push by processing against the ground. Since its long body makes many loops and each loop gives it this push the snake moves forward very fast and not in a straight line.



Movement of snake

Birds

Birds can fly in the air and walk on the ground. Some birds like ducks and swans also swim in water. The birds can fly because their bodies are well recited for flying. Their bones are hollow and light. The bones of the hind limbs are typical for walking and perching. The bony parts of the forelimbs are modified as wings. The shoulder bones are strong. The breast bones are modified to hold muscles of flight which are used to move the wing up and down.



Bird

Know the Keywords :

Cartilage : A strong smooth material, also called gristle.

Rib cage : The flexible cage protecting your heart and lungs.

Skull : A round bony box protecting your brain.

Point to Remember

- Our body has five kinds of joints : (i) Ball and socket joints (ii) Pivot joint (iii) Hinge joint (iv) Fixed joint (v) Gliding joint.
- Bones are the hard structures made of living cells and minerals.
- There are total of 206 bones in our skeleton.
- The soft fleshly portion of our body is called muscle.

EXERCISE TIME

A. Answer the following questions :

1. What is a ball and socket joint ?
2. What is the pelvis ?
3. How does a bird fly ?
4. What is the rib cage ? Explain its structure and function.
5. Explain the functioning of a sliding joint.
6. Explain the functioning of cartilage.

B. Fill in the blanks :

1. Joints of the bones help in the _____ of the body.
2. A combination of bones and cartilages forms the _____ of the body.
3. The bones at the elbow are joined by a _____ joint.
4. The contraction of the _____ pulls the bones during movement.

C. Write 'T' for true and 'F' for false statements :

1. The cartilage is harder than a bone.
2. The fingers do not have joints.
3. The fore arm has two bones.
4. The ball and socket joints allow movement in one plane only.
5. There are 12 pairs of ribs in the human body.

D. Tick (✓) the correct option :

1. Our body has five kinds of :

(i) muscles (ii) joints (iii) none of these

2. Human body has a bony framework, the skeleton, which is made of 206 :

(i) bones (ii) muscles (iii) joints

3. Twenty one bones make up the :

(i) skeleton

(ii) skull

(iii) none of these

4. Snakes have a long :

(i) bones

(ii) backbones

(iii) Gait

5. The joint found in hips is :

(i) ball and socket joint

(ii) hinge joint

(iii) gliding joint

6. The spine consists of :

(i) 23 bones

(ii) 33 bones

(iii) 9 bones

7. Heart and lungs are protected by :

(i) skull

(ii) spine

(iii) rib cage

8. A fish has a :

(i) boat like body

(ii) stream lined body

(iii) ship like body



Creative Work

- Draw diagram of different types of joints in the space below :