Chapter- 9

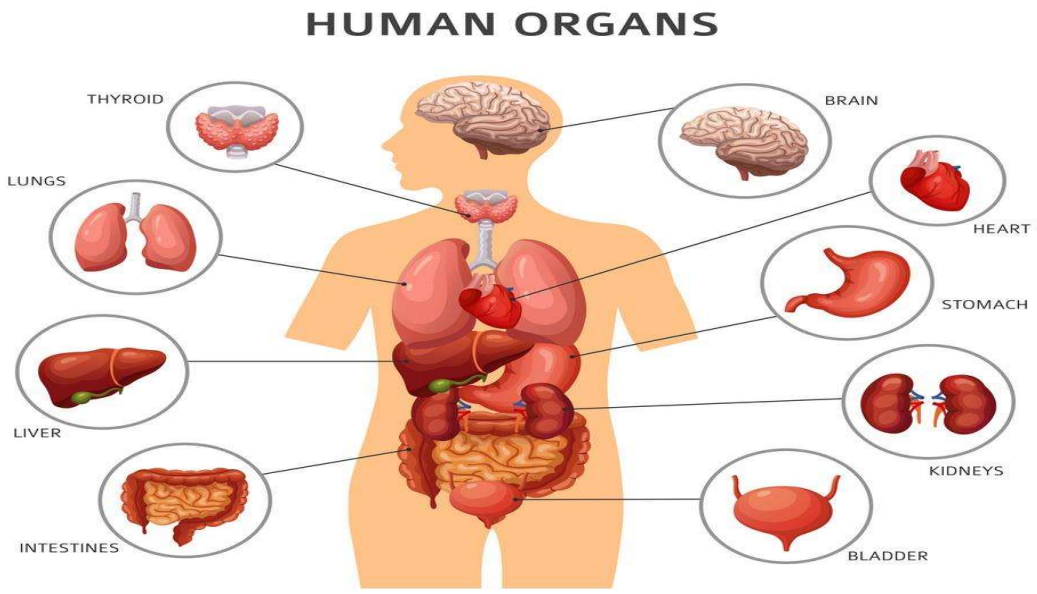
Our Skeletal System

STUDY NOTES

Let's Learn

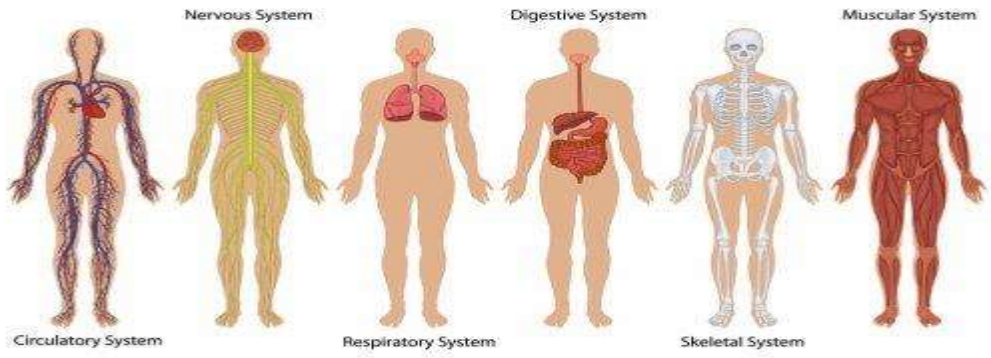
Organ:

- A part of our body which is specialized to perform a particular function is known as an organ.
- E.g.: kidney, heart, stomach, etc.



Organ system:

- A group of organs together make up an organ system.
- E.g.: Digestive system, muscular system, etc.

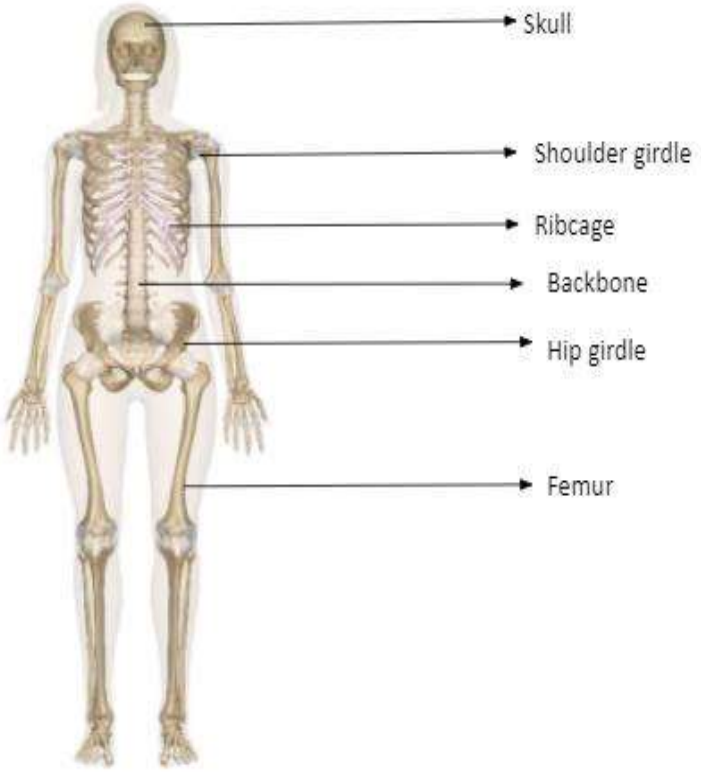


Types of organ systems and their function:

- The nervous system:
    - It consists of the brain, the spinal cord and the nerves.
    - It controls the working of the internal organs, our movement and even our thoughts and emotions.
- The circulatory system:
    - It consists of the heart, blood vessels and blood.
    - It supplies blood to all the parts of the body.
- The digestive system:
    - It consists of mouth, food pipe, stomach, small intestine, large intestine and anus.
    - It helps in the digestion of food.
- The respiratory system:
    - It consists of the nose, windpipe and the lungs.
    - It helps in exchange of gases.
- The skeletal system:
    - It consists of the bones.
    - It protects the internal organs and give support, strength and shape to the body.
- The reproductive system:
    - It consists of the reproductive organs.
    - It helps in reproduction.
- The muscular system:
    - It consists of the muscles.
    - It helps in movement of body parts along with skeletal system.

The Skeleton:

- The human skeleton is a framework of bones which encloses and protects all the internal organs and gives support, strength and shape to the body.
- It consists of the skull, the backbone, the rib cage and the two pairs of limbs, i.e., the fore limbs and the hind limbs.
- These limbs are attached to two pairs of girdles: forelimbs with shoulder girdle and hind limbs with hip girdle.



The Skull:

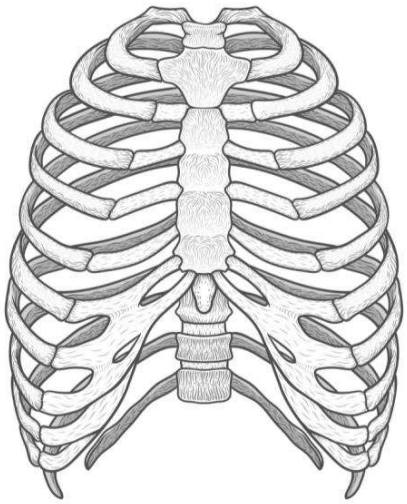
- It is made up of 22 bones.
- Eight flat bones, interlock together, enclose the delicate brain inside it.
- There are 14 bones in the facial regions and among them only the lower jaw is movable which enables us to eat and talk.

The Backbone:

- The skull is attached to the backbone which forms the main axis of the skeleton.
- It is made up of 33 small bones called vertebrae which forms a strong column called the vertebral column.
- The vertebral column protects the delicate spinal cord.

The Rib Cage:

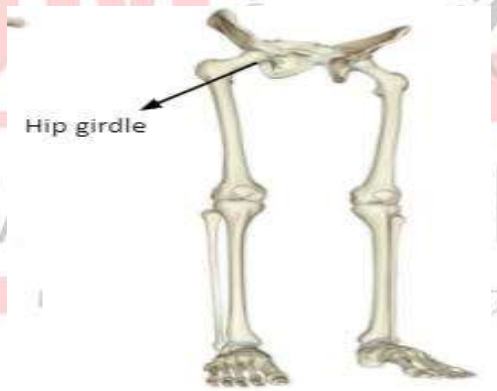
- There are 12 pairs of bow-shaped ribs which form a cage and encloses the heart and the lungs.
- The ribs are delicate, curved bones which are joined to the backbone and the breastbone.
- The lowest two pairs called floating ribs are joined only to the backbone.



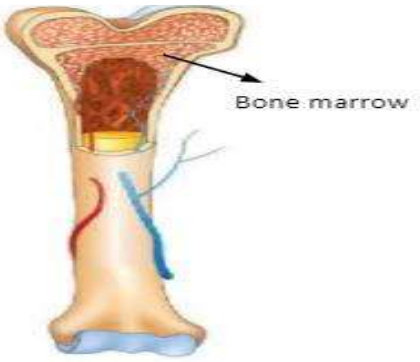
The Limbs:

- The fore limbs or the arms are joined to spine with the help of the shoulder girdle which consist of a pair of shoulder blades and a pair of collarbones.

- The powerful thigh bone called femur bears the weight of the whole body.
- Femur is the longest bone in human body.
- It fits into the hip girdle with a ball and socket joint and is connected to the lower leg at the knee joint.



- The long bones of the skeleton are hollow and are filled with a soft fatty substance called bone marrow.

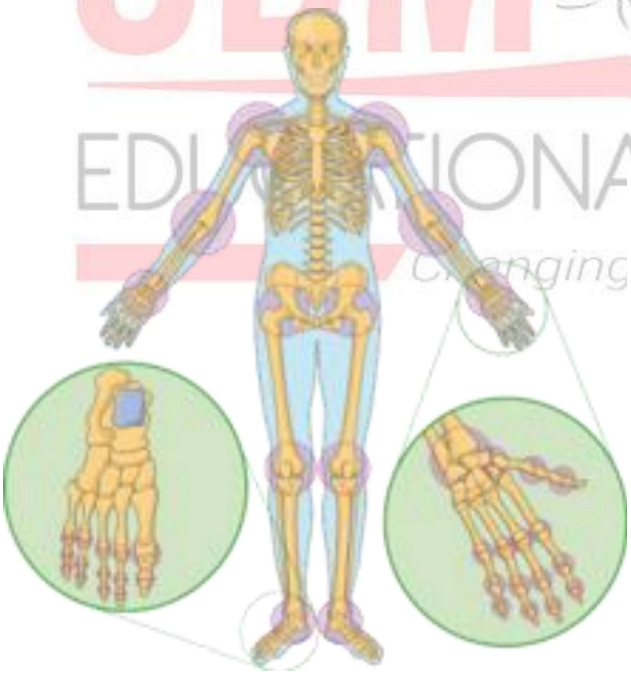


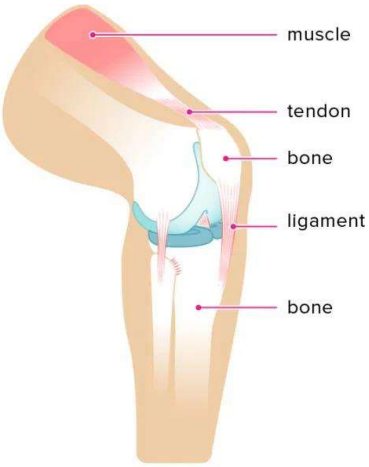
Functions of the skeleton:

- It gives shape, strength and support to our body.
- It also protects our internal organs.
- The skull protects the delicate brain.
- The eyeballs rest inside the bony eye sockets.
- The backbone protects the spinal cord.
- The rib cage protects the lungs and the heart.
- The hip girdle protects the urinary bladder.
- Muscles are attached to bones and make movement possible.
- White blood cells and red blood cells are produced by the bone marrow in hollow bones.
- White blood cells fight for an organism that invade our body.

Joints:

- A joint is the meeting point of two bones held together by strong tissues called ligaments.
- All the joints except those in the skull are movable.
- The bones in the skull are interlocked, making the joints immovable.





Types of joints:

- Movable joints:
  - The joint that allows different kinds of movement of the bones are called movable joints.

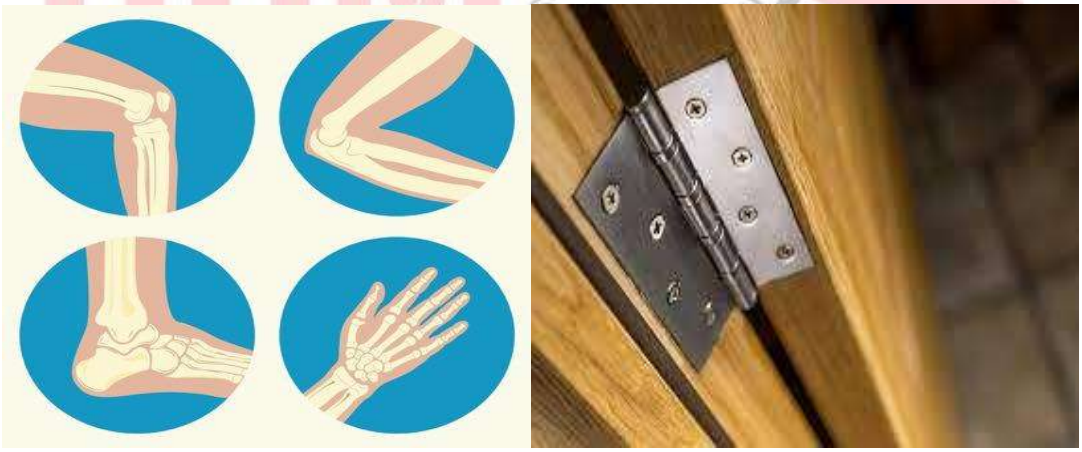
  - E.g.: The joints which are found in wrist, shoulder, etc.
- Immovable joints:
  - The joints that do not allow any kind of movement of the bones are called immovable joints.
  - E.g.: The joints which are found in skull.

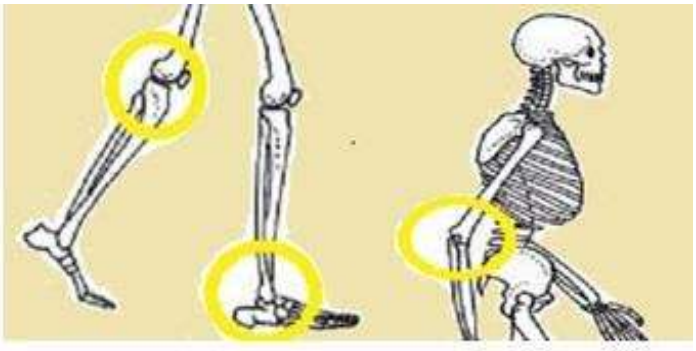
The movable joints:

- The bones at the joints move smoothly because of a fluid which acts like a lubricant.
- There are four types of movable joints in our body:
  - The hinge joints
  - The ball and socket joint
  - The pivot joints
  - The gliding joints

The Hinge joint:

- It is like the hinges in a door.
- We can move the bones only in one direction.
- The elbows, knees, fingers and toes have hinge joints.

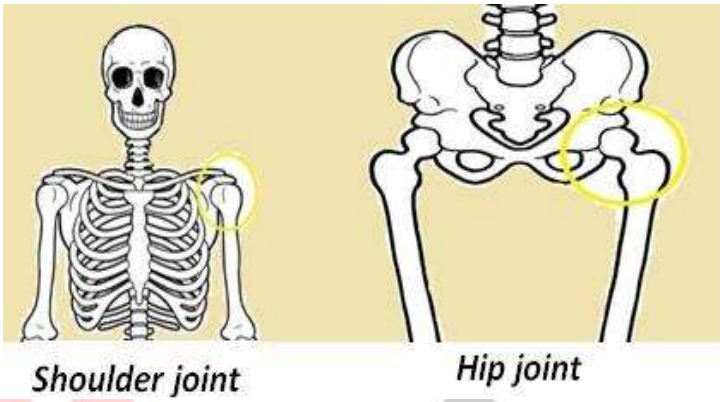




Knee and Ankle joints *Elbow joint*

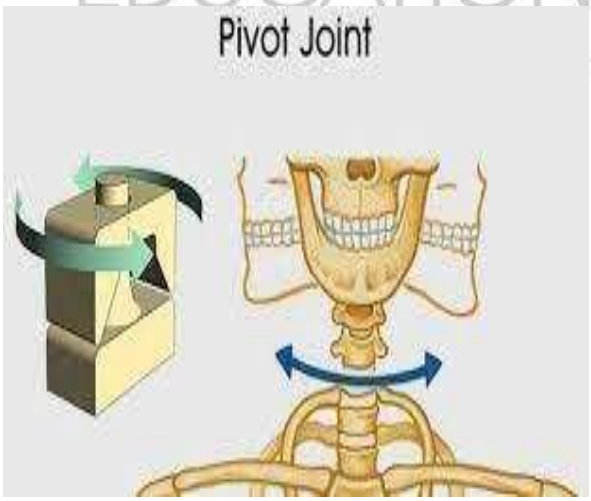
The Ball and Socket joint:

- It allows maximum movement as displayed by ballet dancers.
- One bone that ends in a ball fit into the socket of the other.
- Hip and shoulder joints are of this type.



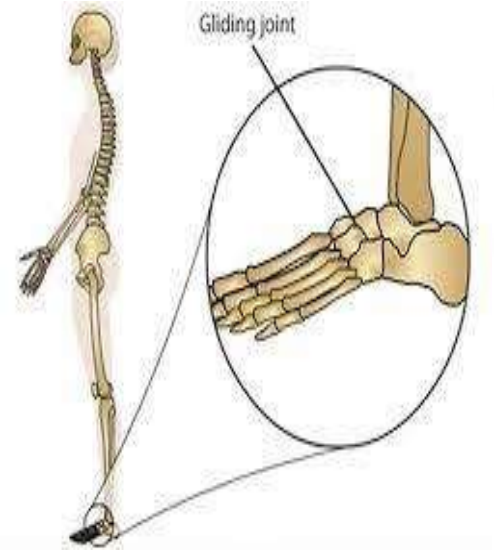
The Pivot joint:

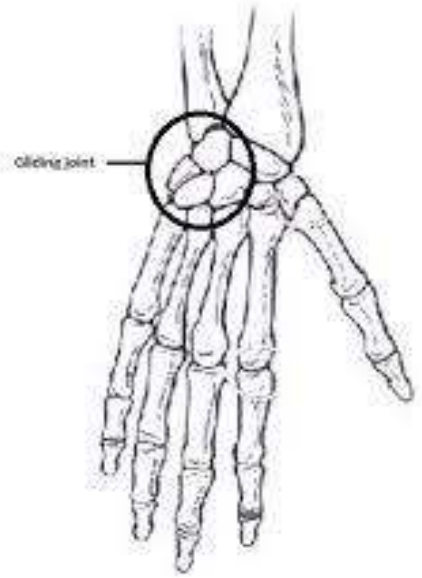
- A pivot joint is found between the skull and the first two vertebrae of the spine.
- The uppermost vertebra in the neck is called atlas.
- We can move our head sideways, upward and downward with the help of the pivot joint.



The Gliding joint:

- It allows movement at the wrist and ankle and also between any two vertebrae of the spine.
- It allows our back to bend, twist and turn at each joint.





Muscles and Movement:

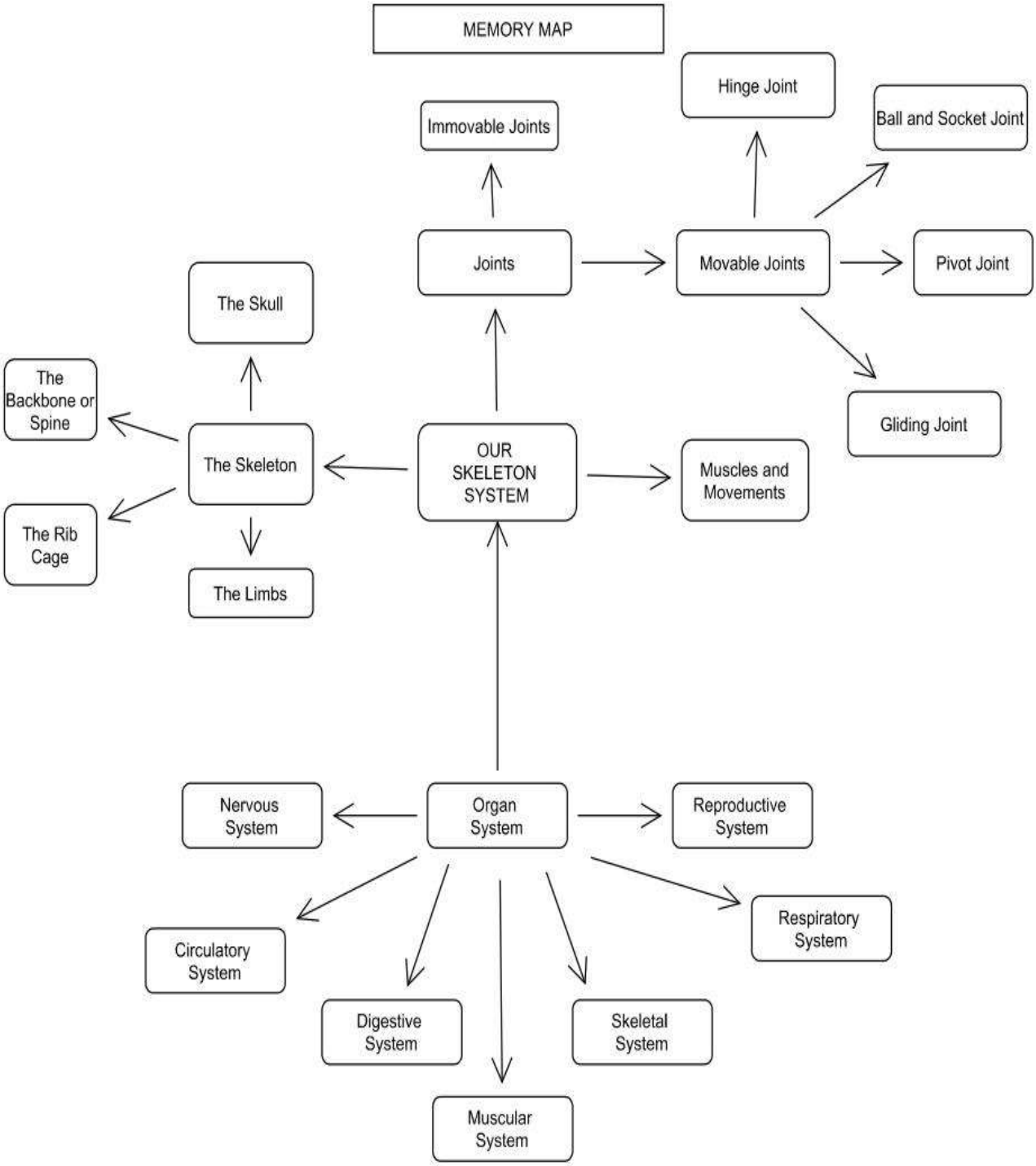
- The muscles in the body tighten and relax to produce movement.
- There are about 650 muscles in the body and each one causes a particular movement.
- Muscles bend our arms and knees, push food into the digestive canal, allow us to inhale air into our lungs, help us to achieve our food and make our heartbeat.
- Muscles are attached to the bones by strong fibres called tendons.
- These tendons or fibres become stronger with regular exercise.

Types of muscles:

- Voluntary muscles:
  - The muscles which are under our control are called voluntary muscles.
  - E.g.: the muscles attached to our skeleton.
- Involuntary muscles:
  - The muscles which are not under our control are called involuntary muscles.
  - They control actions like the movement of food in the ailmentary canal, the flow of blood and the movement of the eye muscles.
- Cardiac muscle:
  - The muscles of the heart are known as cardiac muscles.
  - They are also involuntary muscles but they are structured like voluntary muscles.

How do muscles work?

- Muscles produce movement in the body by pulling on the bones.
- The contraction and expansion of muscles helps to move over body parts.
- When the knee bends, one muscle contracts and get shorter whereas the other one relaxes. When the leg stretches the reverse happens.
- A good poster is needed to be maintain the muscles in good shape.
- We must exercise and rest properly and have a healthy diet in order to keep our body healthy.


MEMORY MAP
Hinge Joint
Ball and Socket Joint
Immovable Joints
Joints
Movable Joints
Pivot Joint
The Skull
The Backbone or Spine
Gliding Joint
The Skeleton
OUR SKELETON SYSTEM
Muscles and Movements
The Rib Cage
The Limbs
Nervous System
Organ System
Reproductive System
Circulatory System
Respiratory System
Digestive System
Skeletal System
Muscular System

Let's Know More

I. Choose the correct answer.

1. A group of organs together make up an organ system/ a tissue/ a cell.
2. The skull is made up of 20/ 22/ 23 bones.
3. The backbone is made up of 33 small bones called bone marrows/ ribs/ vertebrae.

Let's Do

A. Tick the correct answer.

1. The working of the internal organs of our body is controlled by this system.
   a. reproductive
   b. circulatory
   c. respiratory
   d. nervous
2. This joint allows the maximum movement.
   a. ball and socket joint
   b. pivot joint
   c. hinge joint
   d. gliding joint
3. Muscles are attached to the bones with fibres called
   a. ligaments
   b. tendons
   c. bone marrows
   d. ribs
4. These muscles are under our control.
   a. muscles attached to the alimentary canal
   b. muscles attached to our skeleton
   c. cardiac muscles
   d. none of these

B. Fill in the blanks.

1. The human skeleton encloses and protects all the _____ organs of the body.
2. The vertebral column protects the delicate_____ cord.
3. The muscles which are not under our control are called _____ muscles.
4. The_____ are the strong tissues which hold the bones together.
5. The powerful_____ bone bears the weight of the whole body.

C. Match the columns.

1. Vertebral column	a. Heart and lungs
2. Knee	b. Spinal cord
3. Rib cage	c. Brain
4. Skull	d. Hinge joint

Understand and Answer

D. Write short answers.

1. What is a joint?
2. Name the different kinds of movable joints in your body.
3. Which part of the facial region is movable? How does it help us?
4. What is bone marrow?
5. What are tendons?

E. Answer these questions.

1. How is our skeleton useful to us?
2. What is the difference between voluntary and involuntary muscles?
3. How do muscles work?
4. How can we keep our muscles in good shape?

Teacher's Note

- Make a model of human skeleton system.

Improve Your GK

- Babies are born with 300 bones.
- The smallest bone in the body is in your ear.
- More than half your bones are in your hands and feet.
- The biggest joint in your body is your knee.
- Bones are strong, but teeth are stronger.

Answer Key

I.

1. Organ system
2. 22
3. vertebrae

A.

1. Nervous
2. Ball and socket joint

3. Tendons
4. Muscles attached to our skeleton

B.

1. Internal
2. Spinal
3. Involuntary
4. Ligaments
5. Femur

C.

1. b
2. d
3. a
4. c

D.

1. A joint is the meeting point of two bones held together by ligaments.
2. The different kinds of movable joints in our body are:
    - the hinge joint
    - the ball and socket joint
    - the pivot joint
    - the gliding joint
3. The lower jaw of the facial region is movable. It helps us to eat and talk.
4. The soft, spongy material found inside the cavities of long bones is known as bone marrow.
5. Tendons are the strong fibres with which muscles are attached to bones.

E.

1. Our skeleton is useful to us in the following ways:
    - It provides a framework of bones.
    - It encloses and protects all the internal organs.
    - It gives support, strength and shape to the body.
2. Difference between voluntary and involuntary muscles:
    - The muscles which are under our control are known as voluntary muscles where is the muscles which are not under our control are called involuntary muscles.
    - The muscles which are attached to our skeleton are voluntary muscles whereas the muscles of the alimentary canal, eye muscles, cardiac muscles are involuntary muscles.
3. Muscles work in the following way:
    - Muscles produce movement in the body by pulling on the bones.
    - The contraction and expansion of muscles help to move our body parts.
    - When the knee bends, one muscle contracts and get shorter whereas the other one relaxes. When the leg stretches the reverse happens.

4. We can keep our muscles in good shape:
    - By maintaining a good posture while we sit or stand or walk.
    - By exercising and resting properly and having a healthy diet to keep our muscles in good shape.