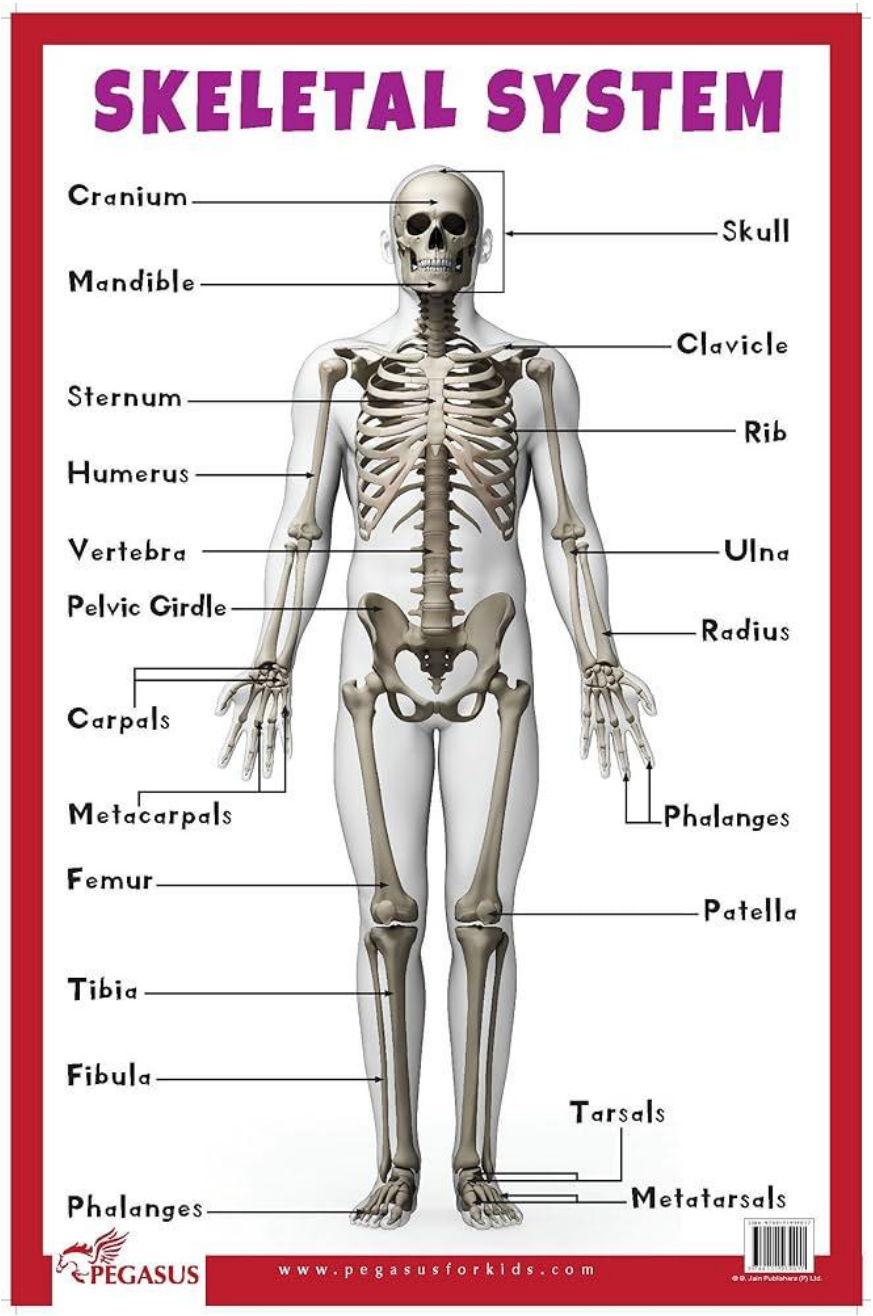
skeletal system: Bones,joints and muscles

The human skeleton can be divided into the

-skeleton is formed by the vertebral column, the rib cage, the skull and other associated bones

-appendicular skeleton is formed by the shoulder girdle, the pelvic girdle and the bones of the upper and lower limbs

The appendicular skeleton of 126 bones and the axial skeleton of 80 bones together form the complete skeleton of 206 bones in the human



Anatomy of the skull:

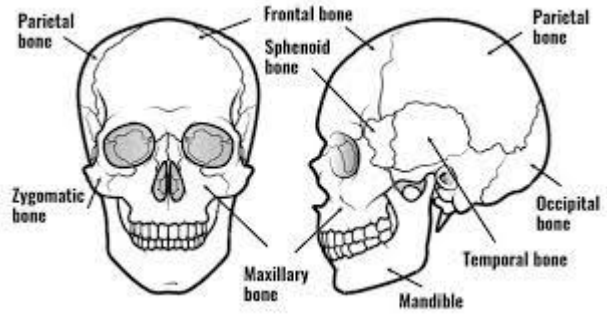
The skull is the topmost part of the bony skeleton of the body, the head, made up of three main areas

1-Cranium - the hollow cavity which surrounds the brain

2-Face the front vertical part of the skull, containing the cavities of the eyes and the nasal cavity of the nose

3-Jaws the upper and lower jaws of the oral cavity





All the bones of the skull except the lower jaw, the mandible, are fixed to each other by immovable joints called sutures

The two jaws are each made up of a pair of bones which are fixed solidly in their midlines

Maxilla - pair of bones forming the upper jaw

Mandible - appears as a single horseshoe- shaped bones forming the lower jaw

The bones of cranium are

1-Frontal bone - front of the cranium above the eyes, forming the forehead

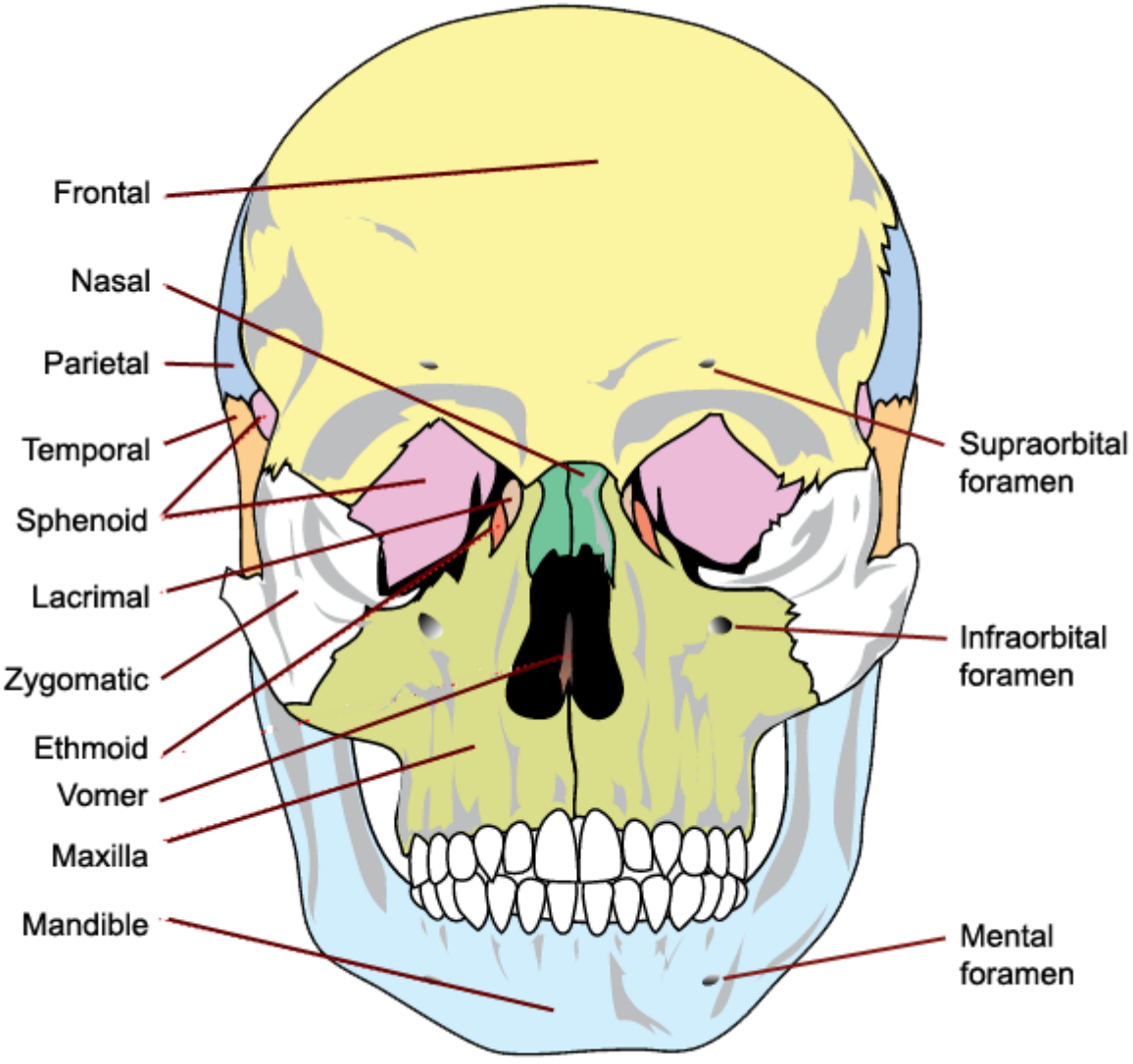
2-Parietal bones - forming the top and the greater area of the sides of the cranium

3-Temporal bones front of the ears. the lower sides of the cranium

4-Occipital bone at the back and partial underside of the cranium.

5-Sphenoid bone - forming the majority of the base (underside) of the cranium

6-Ethmoid bone at the front base section of the cranium, immediately behind the nose



The thoracic cage

is formed by the (a) sternum and (b) 12 pairs of ribs with their costal cartilages. The ribs are anchored posteriorly to the 12 thoracic vertebrae. The sternum consists of the manubrium, body, and xiphoid process. The ribs are classified as true ribs (1-7) and false ribs (8- 12). The last two pairs of false ribs are also known as floating ribs (11-12). The sternum is the elongated bony structure that anchors the anterior thoracic cage.

Ribs: each rib is a curved, flattened bone that contributes to the wall of the thorax.

The spine is made of 33 individual bones stacked one on top of the other.

1-Cervical (neck) - The seven cervical vertebrae are numbered C1 to C7.

2-Thoracic (mid back) - The twelve thoracic vertebrae are numbered T1 to T12

3-Lumbar (low back) - The five lumbar vertebrae are numbered L1 to L5

4-Sacrum - There are five sacral vertebrae, which are fused together

5-Coccyx region - the four fused bones of the coccyx or tailbone

The appendicular skeleton is divided into major regions

1-Pectoral (shoulder) girdles

Scapula(posterior)

Clavicle(anterior)

Humerus(long bone of the upper arm)

Ulna and radius

Hand

Carples

Mrtacarples

phalangrs

2-Pelvis (hip) girdles

hip bone

femur (Thigh), patella

tibia and fibula (leg)

Feet

tarsals (ankle)

metatarsals

phalanges

Bone

Bone is a living tissue like other connective tissues bone consists of cells, fibers, and matrix. It is hard because of the calcification of its extracellular matrix and possesses a degree of elasticity because of the presence of organic fibers

Classification of Bone

1-long Bones

are found in the limbs (e.g., the humerus, femur, metacarpals, metatarsals, and phalanges)

2- short Bones

are found in the hand and foot (e.g., the scaphoid, lunate, talus, and calcaneum)

3- flat Bones

are found in the vault of the skull (e.g., the frontal and parietal bones)

4-irregular Bones

found in the bones of the skull

5- sesamoid Bones

are small nodules of bone that are found in certain tendons

Development of Bone

Bone is developed by two processes: membranous and endochondral. In the first process, the bone is developed directly from a connective tissue membrane; in the second, a cartilaginous model is first laid down and is later replaced by bone. The bones of the vault of the skull are developed rapidly by the membranous method in the embryo, and this serves to protect the underlying developing .

Joints

A site where two or more bones. come together, not movement occurs between them, is called a joint

.Joints are classified according to the tissues that lie betweenthe bones: fibrous joints, cartilaginous joints, .and synovial joints

Classification of Joints

1-A fibrous joint is where the adjacent bones are united by fibrous connective tissue Examples sutures

2- At a cartilaginous joint, the bones are joined by hyaline cartilage or fibrocartilage

3- Synovial joints are the most common type of joint in the body. This gives the bones of a synovial joint the ability to move smoothly against each other, allowing for increased joint mobility. For example: shoulder joints

Muscle

The three types of muscle are skeletal, smooth, and cardiac

Skeletal muscles produce the movements of the skeleton; they are sometimes called voluntary muscles and are made up of striped muscle fibers.

A skeletal muscle has two or more attachments. The attachment that moves the least is referred to as the origin, and the one that moves the most, the insertion. Under varying circumstances, the degree of mobility of the attachments may be reversed;therefore, the terms origin and insertion are interchangeable

The fleshy part of the muscle is referred to as its belly. The ends of a muscle are attached to bones, cartilage, or ligaments by cords of fibrous tissue called