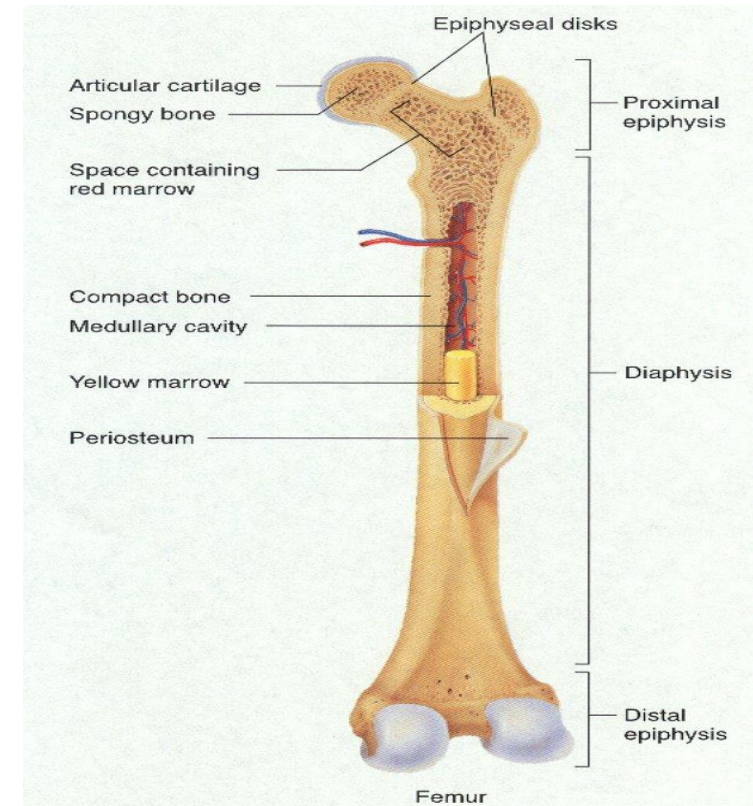


Human Biology

Lecture 2 Theory

Skeletal system

MLA



Dr. Kamal M.

Functions of skeletal system

1. **Movement:** Skeletal system provides points of attachment for muscles. Your legs and arms move when the muscles pull on the bones.
2. **Support:** The backbone is the main support center for the upper body. It holds your head up and protects your spinal cord.
3. **Protection:** The bones of your skull protect your brain. Your ribs protect your lungs and heart from injury.
4. **Makes Blood:** Red and white blood cells are formed by tissue called marrow, which is in the center of the bone.
5. **Storage:** Bones store minerals, such as calcium and phosphorus, for use by the

BONES ARE GROUPED INTO THE AXIAL SKELETON AND THE APPENDICULAR SKELETON

Bones of the **appendicular skeleton** facilitate movement - **girdles and limbs**

Bones of the **axial skeleton** protect internal organs – **skull, vertebral column and thoracic cage**

Of the 206 bones, 80 are in the axial skeleton, with 64 in the upper appendicular and 62 in the lower appendicular skeleton.



The skeletal system is divided into two main parts:

1. Axial skeleton

2. Appendicular skeleton

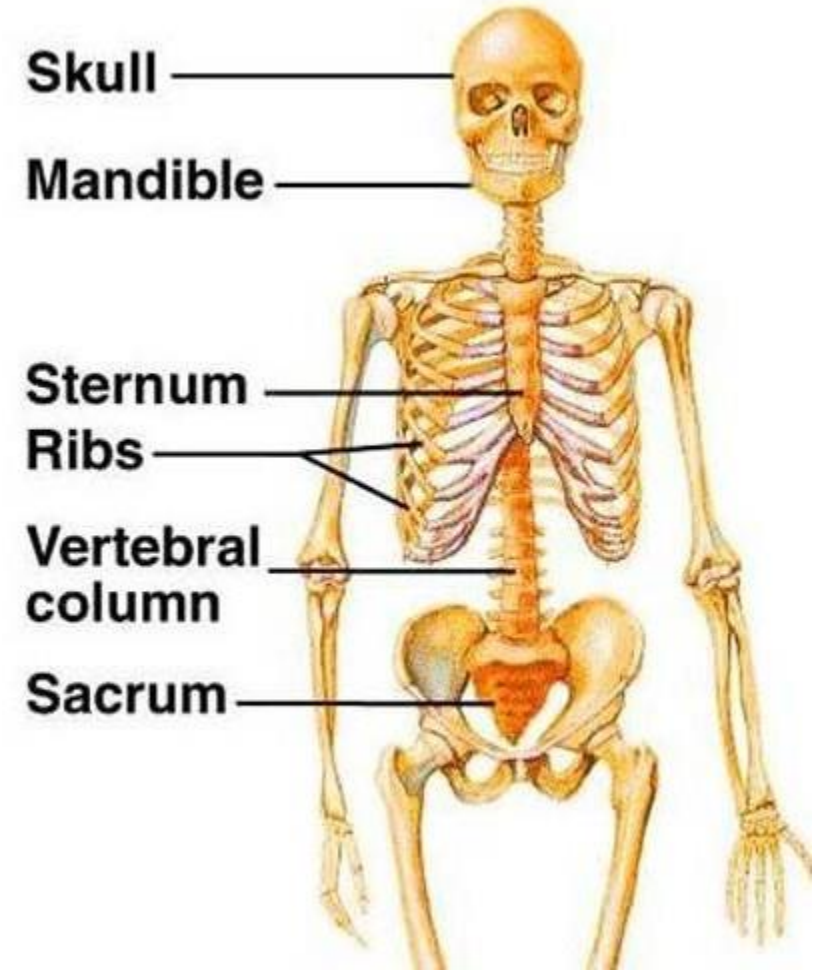
Axial skeleton Includes the **80 bones** of the skull, spine, ribs, and sternum.

Skull protects brain

Spine (vertebral column) protects spinal cord

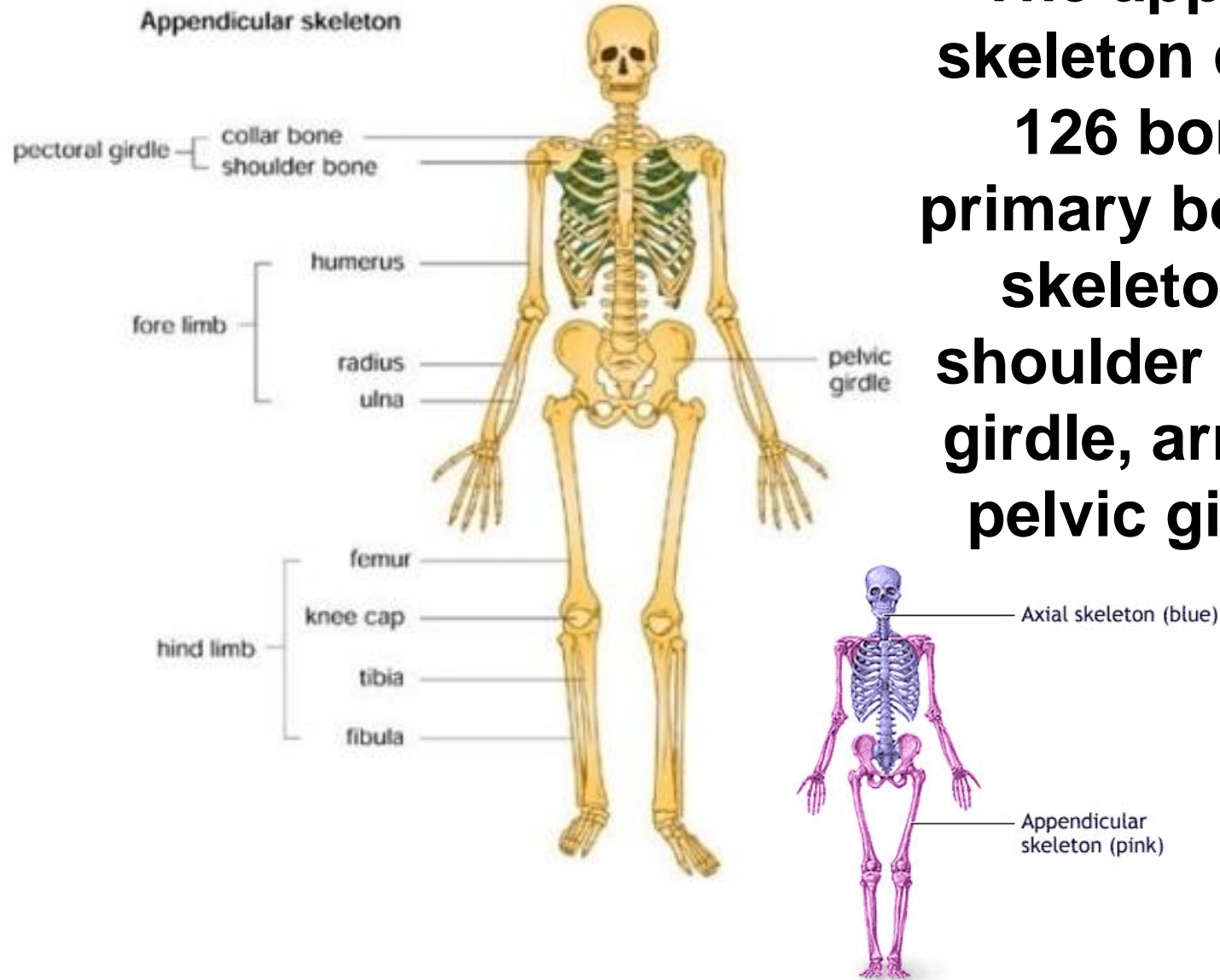
Ribs protect lungs and heart

Sternum is breast bone.



Appendicular skeleton...

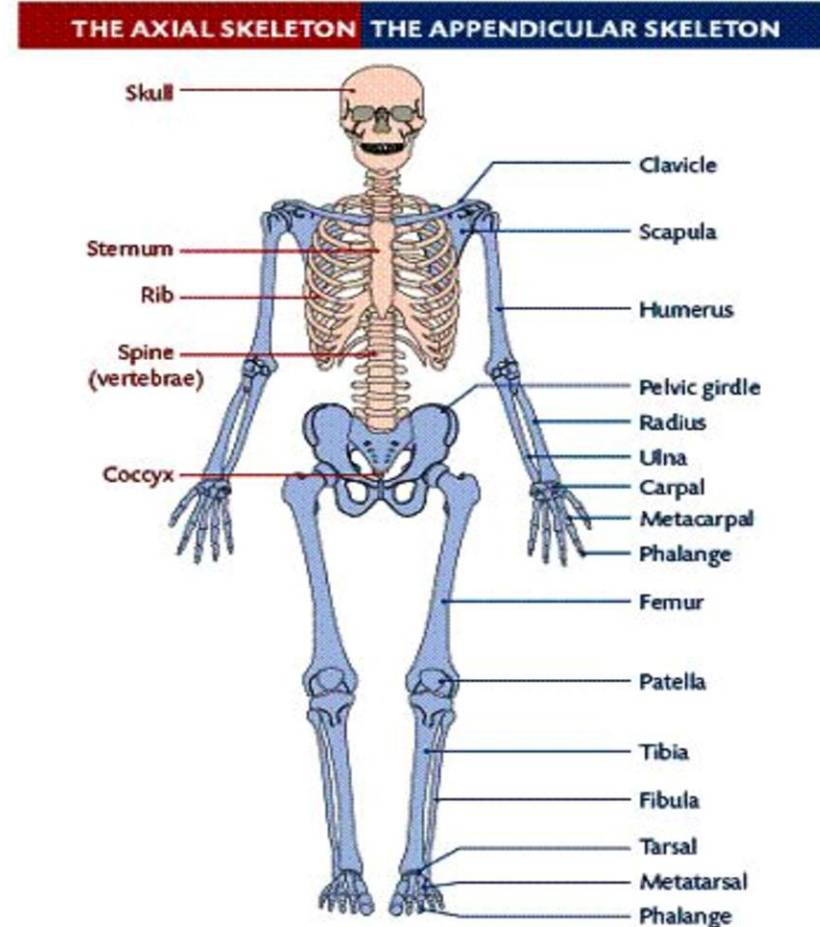
The appendicular skeleton consists of 126 bones. The primary bones of this skeleton are the shoulder or pectoral girdle, arms, hands, pelvic girdle, legs, and feet.



The Skeleton

The skeleton, which is formed of 206 bones is divided into:

1. **Axial skeleton** (الهيكل المحوري): bones forming the **trunk** (الجذع) (longitudinal axis) of the body
2. **Appendicular skeleton** (الهيكل الطرفي): bones forming the **girdles** (الأحزمة) & **limbs** (الأطراف)



The **appendicular skeleton** includes the bones (**126 bones**) of the limbs and the girdles.

1. The pectoral girdle (Clavicle and scapula bones) forms your shoulders

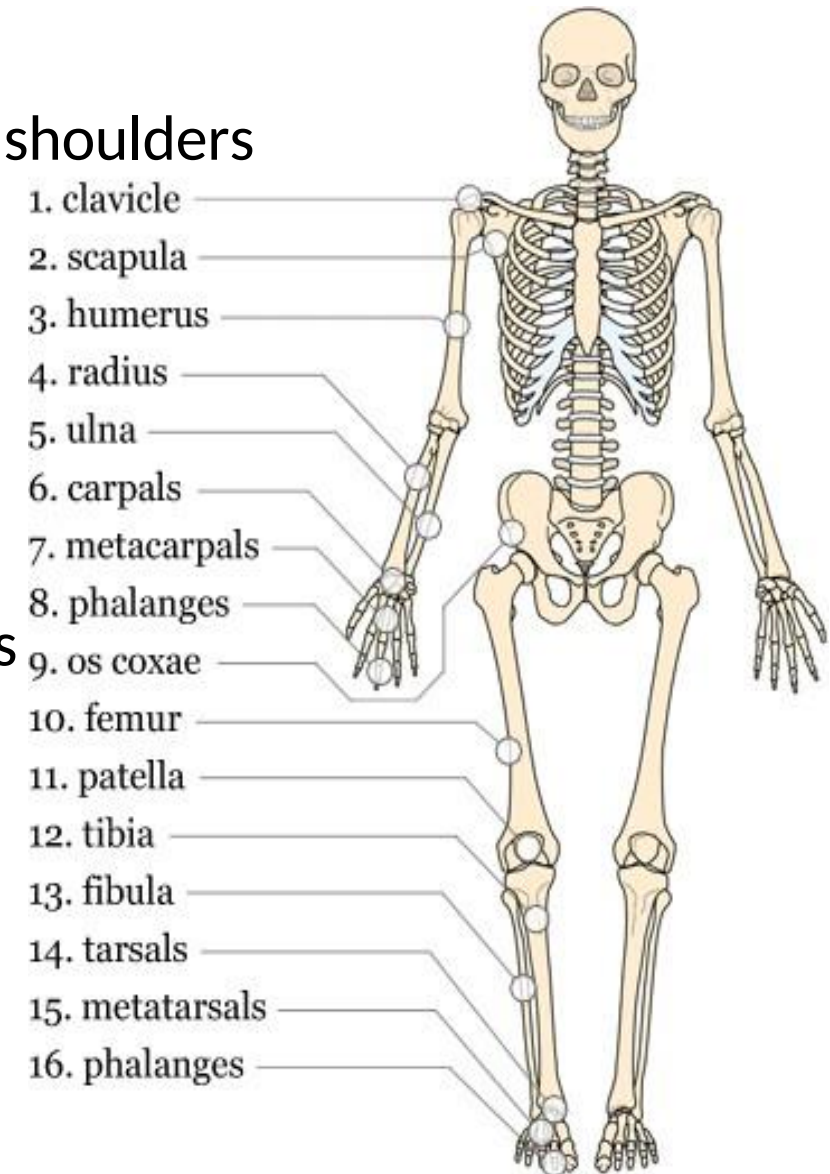
2. Upper limbs

- a) Arm (humerus bone)
- b) Forearm (radius and ulna bones)
- c) Hand bones

3. The pelvic girdle is composed of the appendicular hip bones

4. Lower limb bones

- a) Femur (hip bone)
- b) Patella (knee cap)
- c) Tibia
- d) Fibula

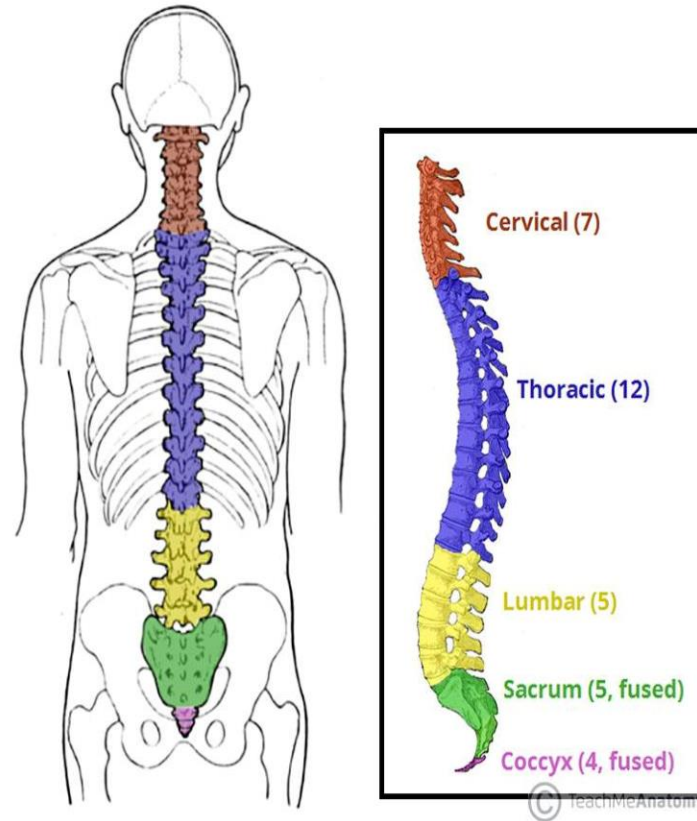


Bones of the Axial Skeleton (Vertebral Column)

The vertebral column consists of **33** bones (vertebrae), its functions to protect the spinal cord and support the body

The vertebral column is formed of:

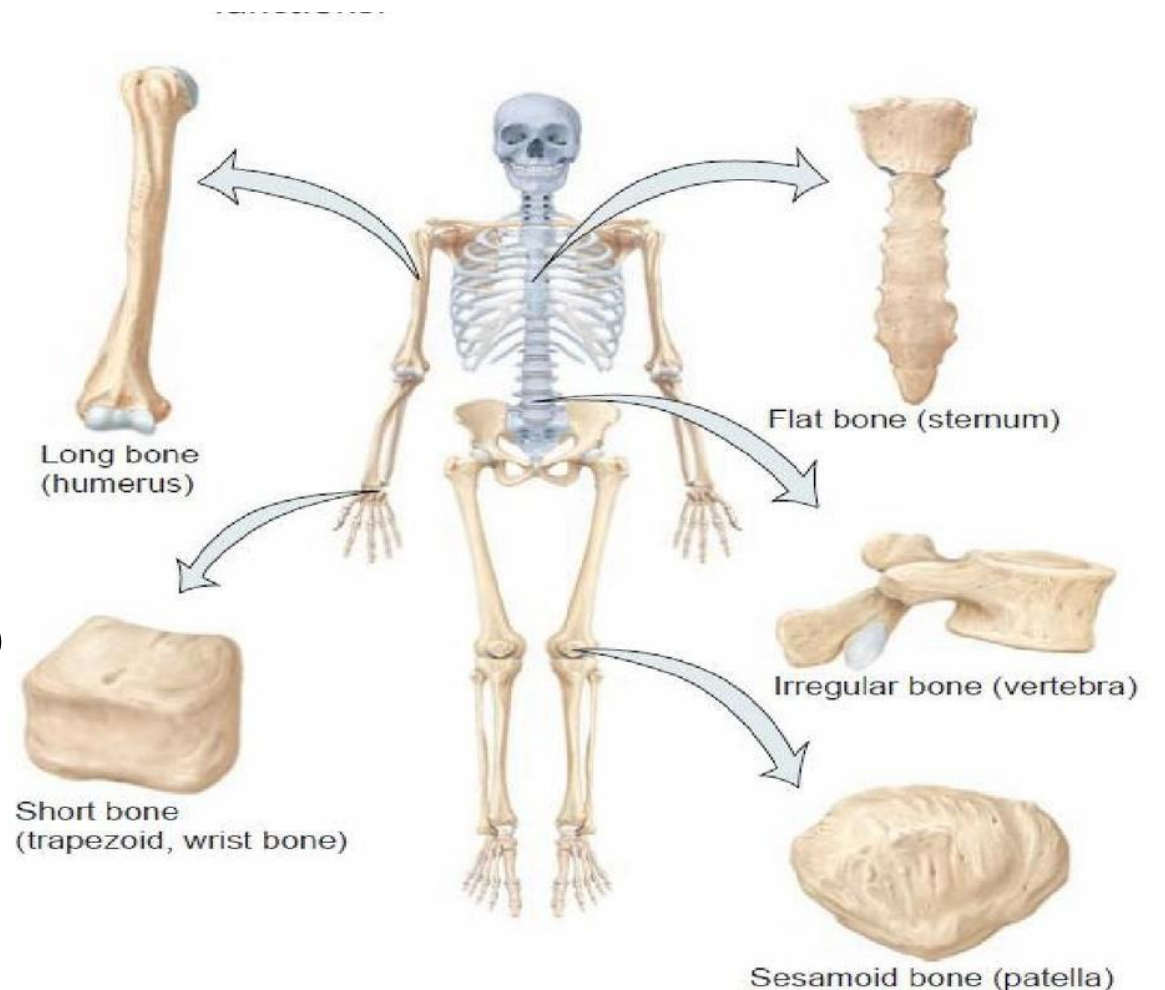
- **7** cervical vertebrae (الفقرات العنقية)
- **12** thoracic vertebrae (الفقرات الصدرية)
- **5** lumbar vertebrae (الفقرات القطنية او البطنية)
- **5** sacral vertebrae **fused** to form **sacrum** (العُجْز)
- **4** coccygeal vertebrae **fused** to form **coccyx** (العصعص)



Types of bone

According to their shapes, bones are divided into five groups:

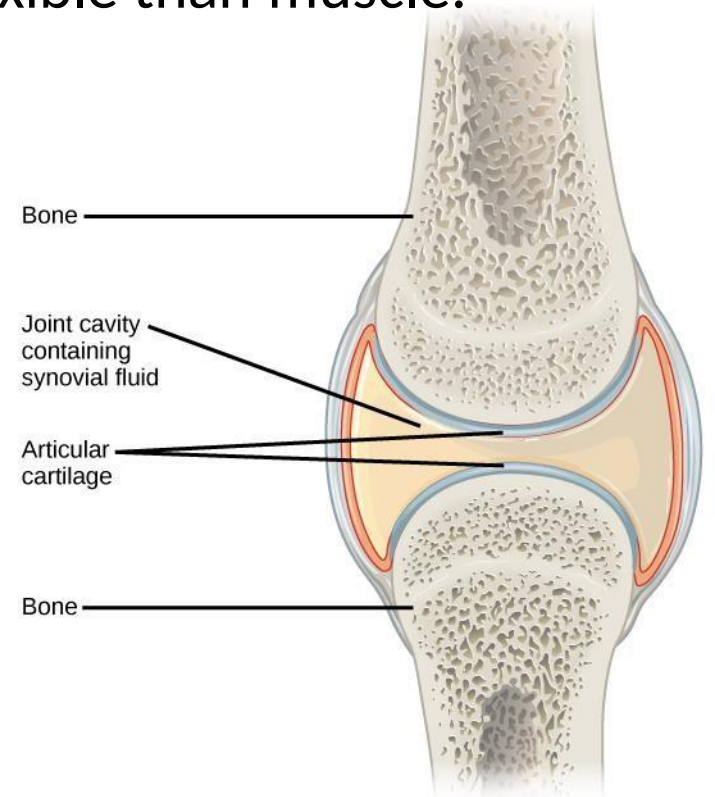
1. **Long:** arm, leg and finger
2. **Short:** wrist and ankles
3. **Flat:** skull, sternum and pelvis
4. **Irregular:** vertebrae
5. **Sesamoid or round bone:** knee cap



Connectors of the body

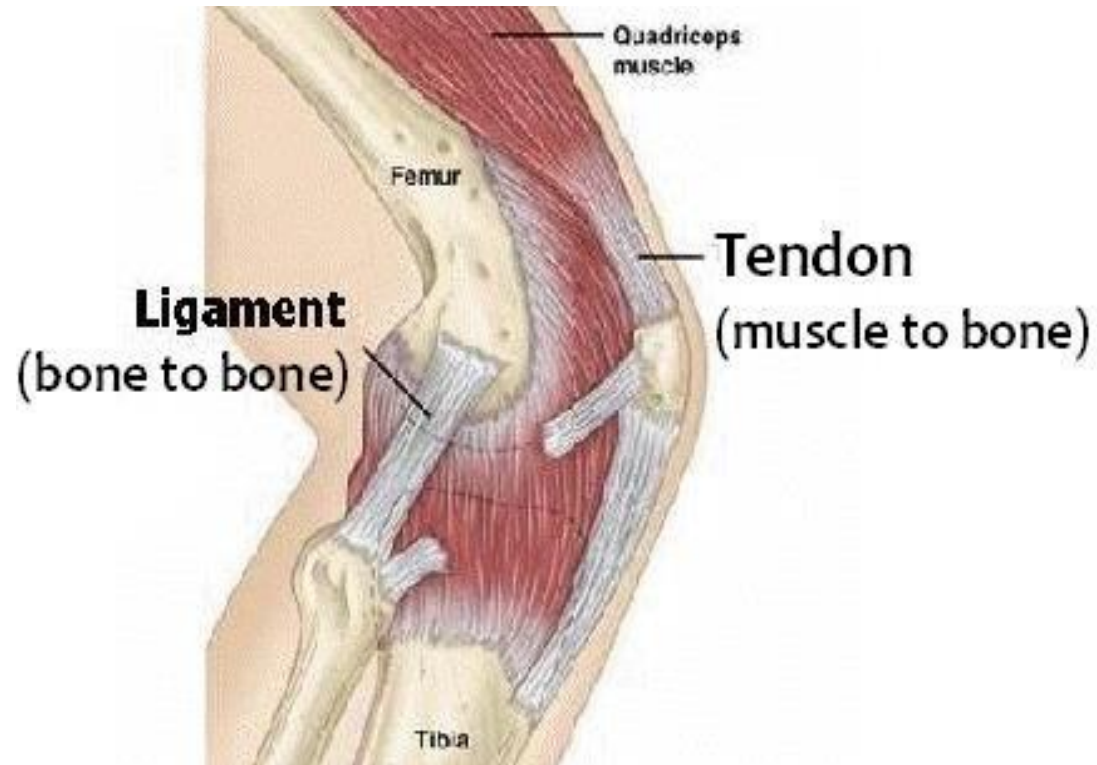
1. Cartilage

- Cartilage is a flexible connective tissue found in many areas in the bodies of humans and other animals, including the joints between bones, the rib cage, the ear, the nose, the bronchial tubes and the intervertebral discs.
- It is not as hard and rigid as bone but is stiffer and less flexible than muscle.
- **Cartilage** is a specialised type of connective tissue. It consists, like other connective tissues, of cells and extracellular components.
- In joints, cartilages act as a cushion to protect bone.



Connectors of the body

2. **Tendon:** is a tough band of fibrous connective tissue that usually connects muscle to bone.
3. **Ligament:** fibrous connective tissue that connects bones to other bones.



Long Bone Structure

- Shaft plus 2 expanded ends.
- Shaft is known as the **diaphysis**.
 - Consists of a thick collar of compact bone surrounding a central marrow cavity
 - In adults, the marrow cavity contains fat - yellow bone marrow.
- Expanded ends are **epiphyses**
 - Thin layer of compact bone covering an interior of spongy bone.
 - Joint surface of each epiphysis is covered w/ a type of hyaline cartilage known as **articular cartilage**. It cushions the bone ends and reduces friction during movement.

