



**INTRODUCTION TO ANATOMY
AND SKELETAL SYSTEM**



OBJECTIVES

By the end of the lecture, you should be able to:

- Define the word “Anatomy”.
- Enumerate the different anatomical fields.
- Describe the anatomical position.
- Describe different anatomical terms of position & movements as well different anatomical planes.
- Classify bones according to shape, structure & development.
- Enumerate different bones of both axial & appendicular skeleton.

WHAT IS ANATOMY?

The word **anatomy** is of **Greek** origin meaning cutting up (ana= up; tome= cutting).

- **Gross (macroscopic) anatomy: Study of human body with naked eye.**
- **Microscopic anatomy; (Histology): Study of fine structure (cells & tissues) of the human body with the help of microscope.**
- **Developmental anatomy; (Embryology).**
- **Radiological anatomy.**
- **Applied anatomy.**
- **Surface anatomy.**
- **Surgical anatomy.**

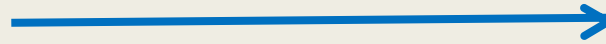
ANATOMICAL POSITION

- It is the standard position in which the body assume to describe its parts.

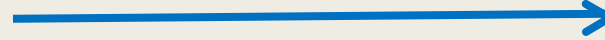
Body is erect



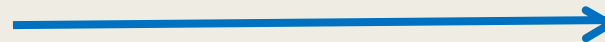
Arms hanging by the side



Palm facing forward

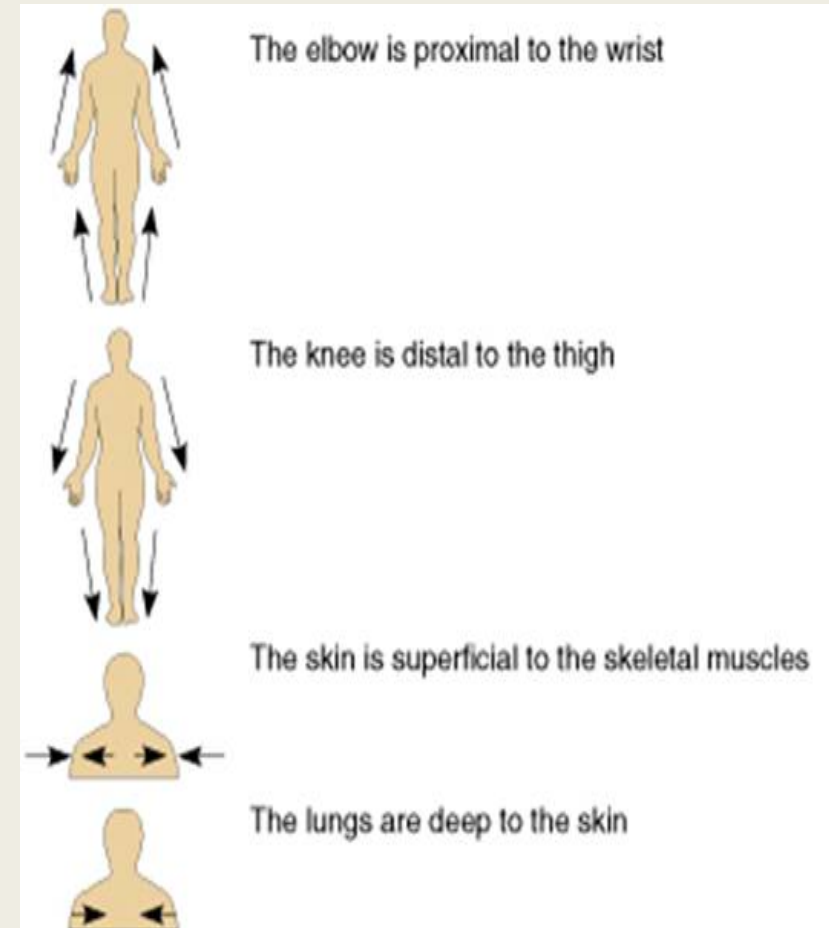


Feet are parallel



ANATOMICAL TERMINOLOGY

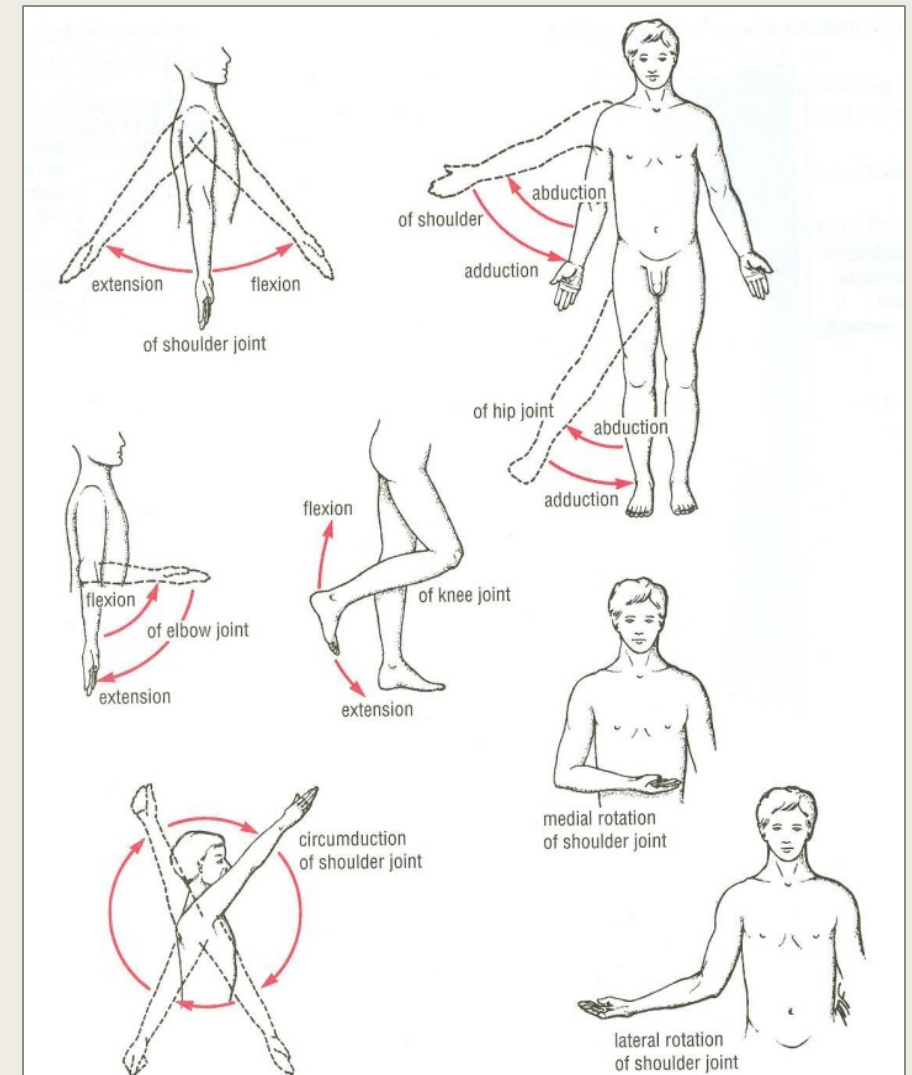
- ❑ **Superior (cranial):** near to head.
X **Inferior (caudal):** away from head.
- ❑ **Anterior (ventral):** near to front.
X **Posterior (dorsal):** near to back.
- ❑ **Medial:** near to median plane.
X **Lateral:** away from median plane
- ❑ **Proximal:** near to trunk.
X **Distal:** away from trunk.
- ❑ **Superficial:** near to skin (surface).
X **Deep:** away from skin.



ANATOMICAL TERMINOLOGY

■ TERMS OF GENERAL MOVEMENTS

- **Flexion:** approximation of 2 parts (decreasing the angle between 2 parts).
- ✗ **Extension:** straightening (increasing the angle between 2 parts).
- **Abduction:** away from median plane.
- ✗ **Adduction:** toward median plane.
- **Lateral rotation:** rotation away from median plane.
- ✗ **Medial rotation:** rotation toward median plane.
- **Circumduction:** combined movements of flexion, extension, abduction & adduction.



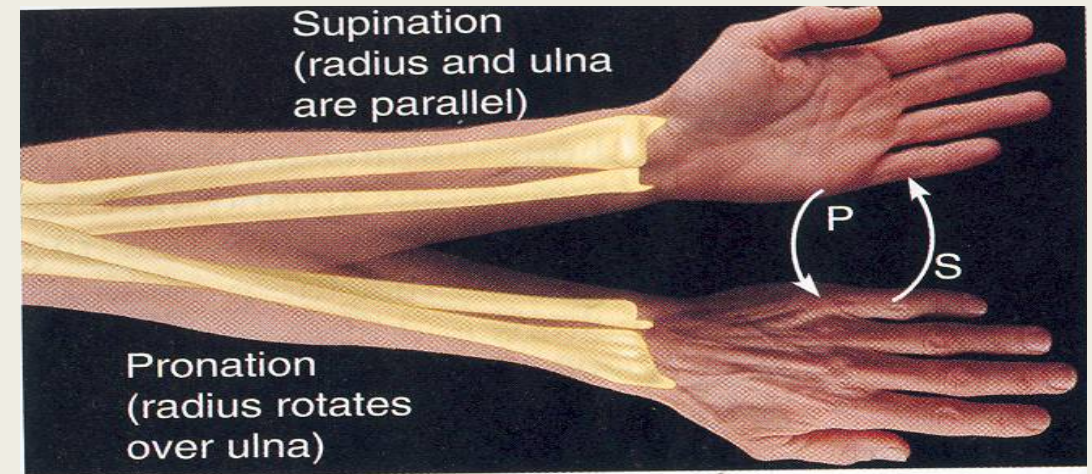
Special Movements Of Upper Limb

- **Opposition**: bringing tips of fingers and thumb together as in picking something up



Special Movements Of Upper Limb

- **Supination:**
 - *Lateral rotation of the forearm.*
 - *The palm faces Anteriorly.*
 - *The radius and ulna are Parallel.*
- **Pronation:**
 - *Medial rotation of the forearm.*
 - *The palm faces Posteriorly*
 - *The radius Crosses the ulna and the two bones form an X.*



(g) Supination (S) and pronation (P)

Special Movements Of Lower Limb

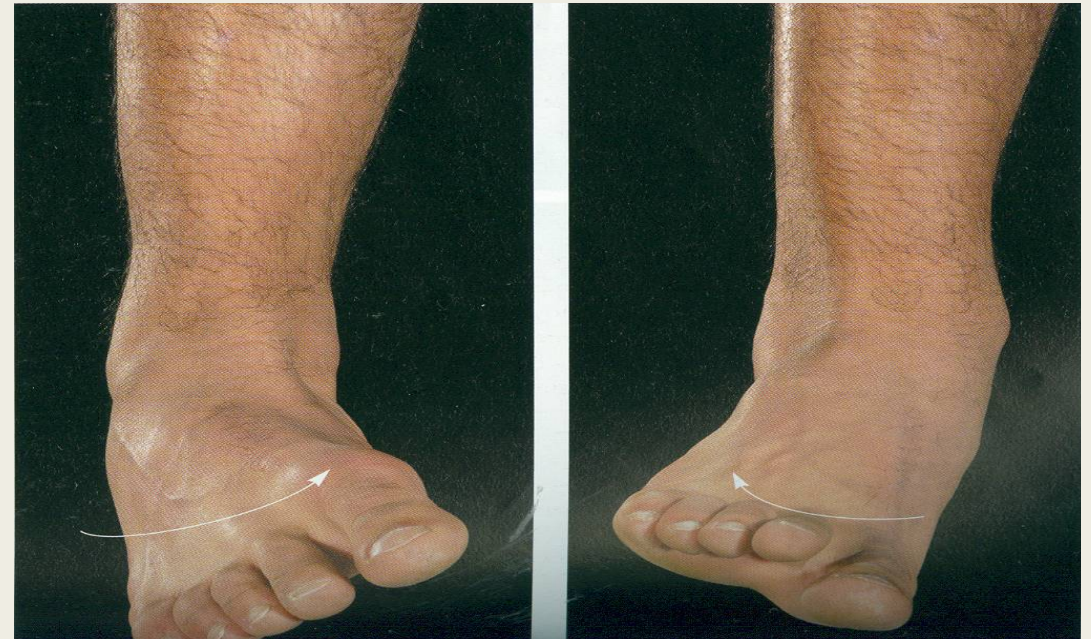
- **Dorsiflexion**
- *Up movement of the foot*
- *(Standing on the heels)*

- **Planter Flexion:**
- *Depressing the foot (down).*
- *Movement with pointing the toes.*



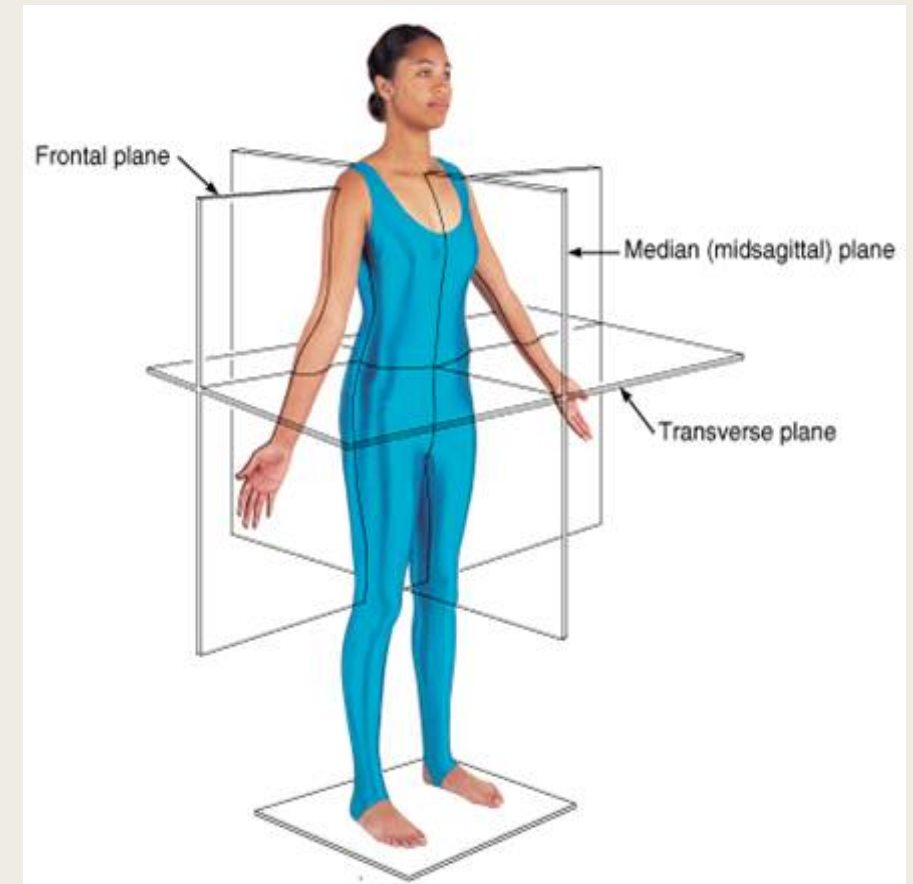
Special Movements Of Lower Limb

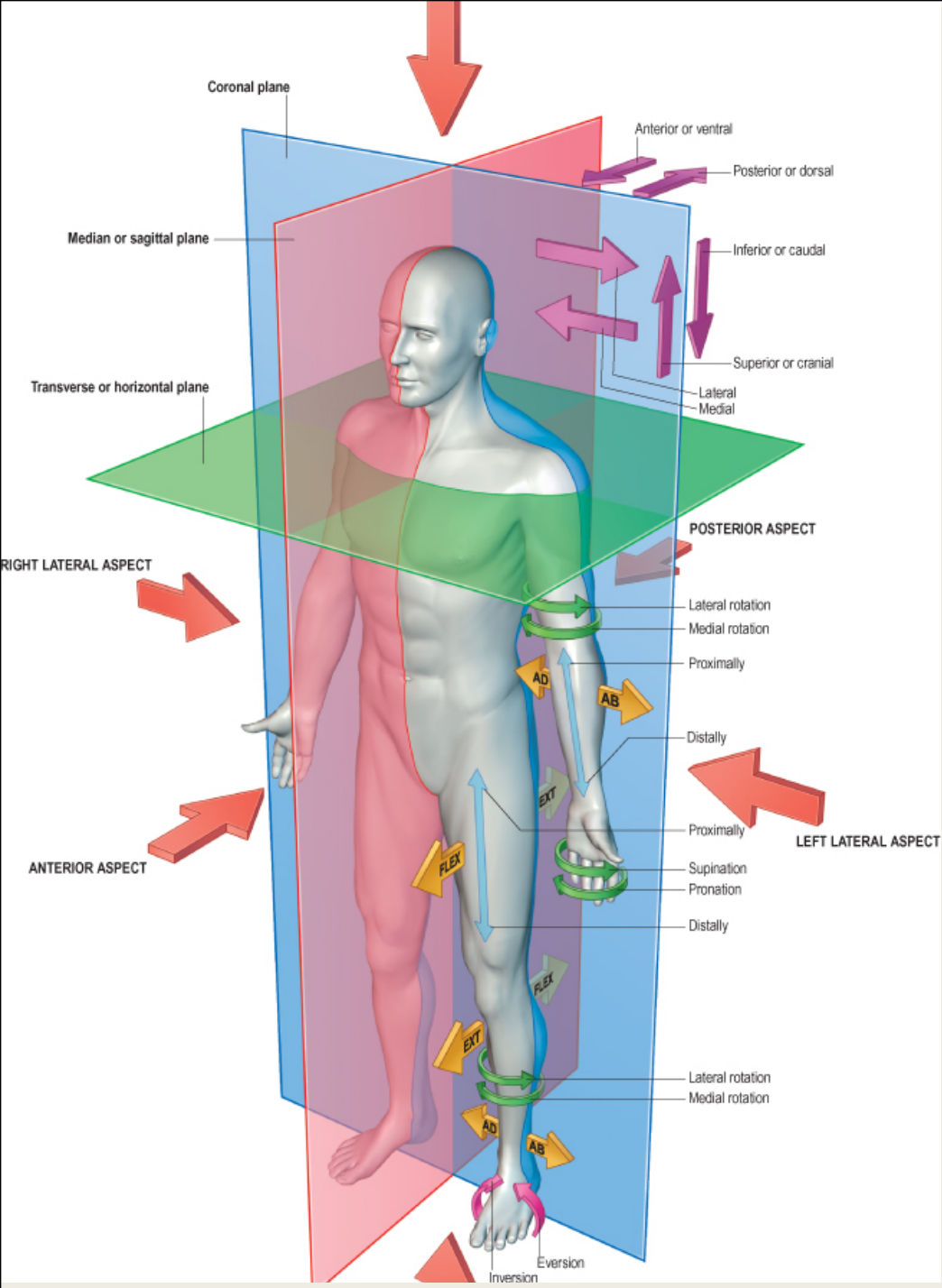
- **Inversion** :
- *The sole faces in a Medial direction.*
- **Eversion** :
- *The sole faces in a Lateral direction*



ANATOMICAL PLANES & SECTIONS

- ❑ **Sagittal (median):** divides the body into 2 equal halves (right & left).
- ❑ **Parasagittal (paramedian):**
divides the body into 2 unequal parts (right & left).
- ❑ **Frontal (coronal):**
divides the body into anterior & posterior parts.
- ❑ **Transverse (cross):** divides the body into superior & inferior parts



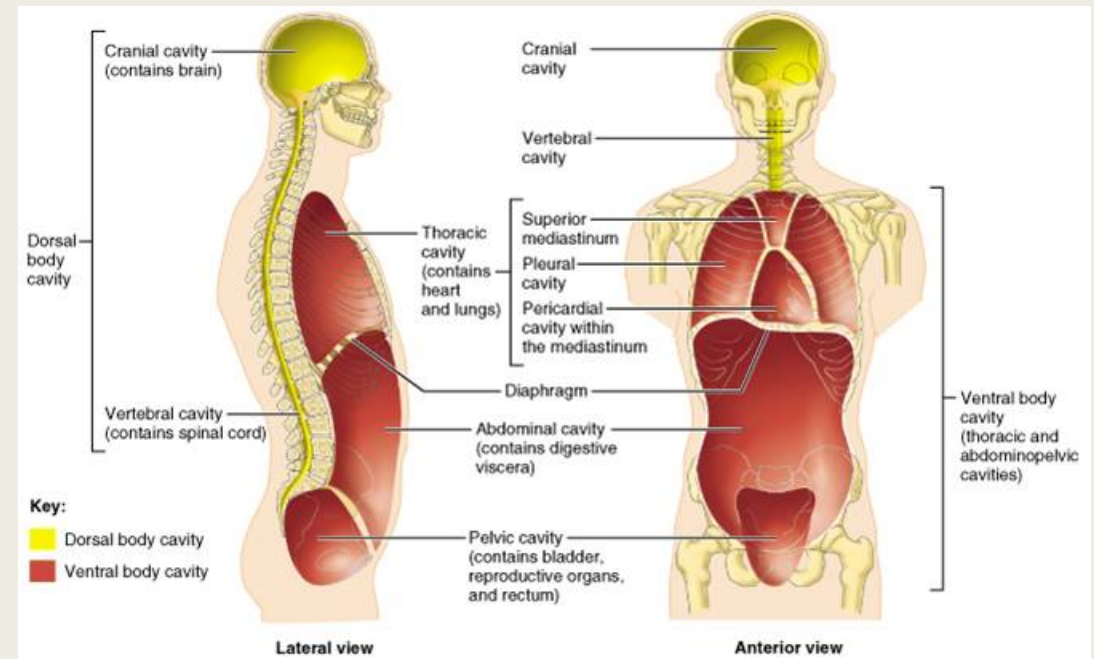


PLANES, TERMS OF POSITION & TERMS OF MOVEMENT

BODY CAVITIES

- ❑ **Ventral body cavity:** divided by diaphragm into:
 1. **Thoracic cavity:** superior to diaphragm, contains heart & lungs.
 2. **Abdominal cavity:** inferior to diaphragm, contains stomach, intestine, liver, urinary bladder, etc...

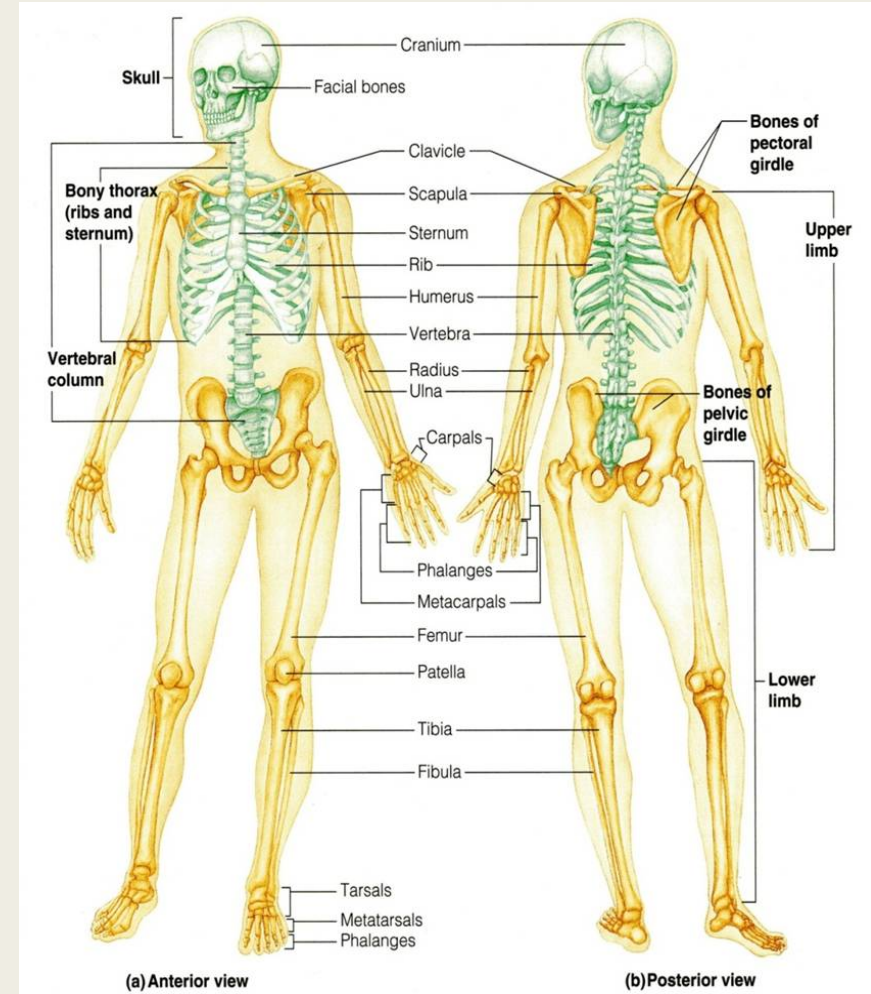
- ❑ **Dorsal body cavity:** divided into 2 parts continuous with each other:
 1. **Cranial cavity:** space inside skull, contains brain
 2. **Spinal cavity:** space inside vertebral column, contains spinal cord



SKELETAL SYSTEM

Includes:

- Bones
- Joints: articulations between bones



FUNCTIONS OF BONE

1. **Support:** of the body.
2. **Storage:** of fat and minerals e.g. calcium and phosphorus.
3. **Protection:** of soft body organs.
4. **Attachment:** of muscles.
5. **Movement:** of the body as a whole, or of the body parts.
6. **Blood cell formation.**

CLASSIFICATION OF BONE

Bones are classified on the bases of their:

- **Shape:**

- Long,

- Short,

- Flat,

- Irregular.

- **Structure:**

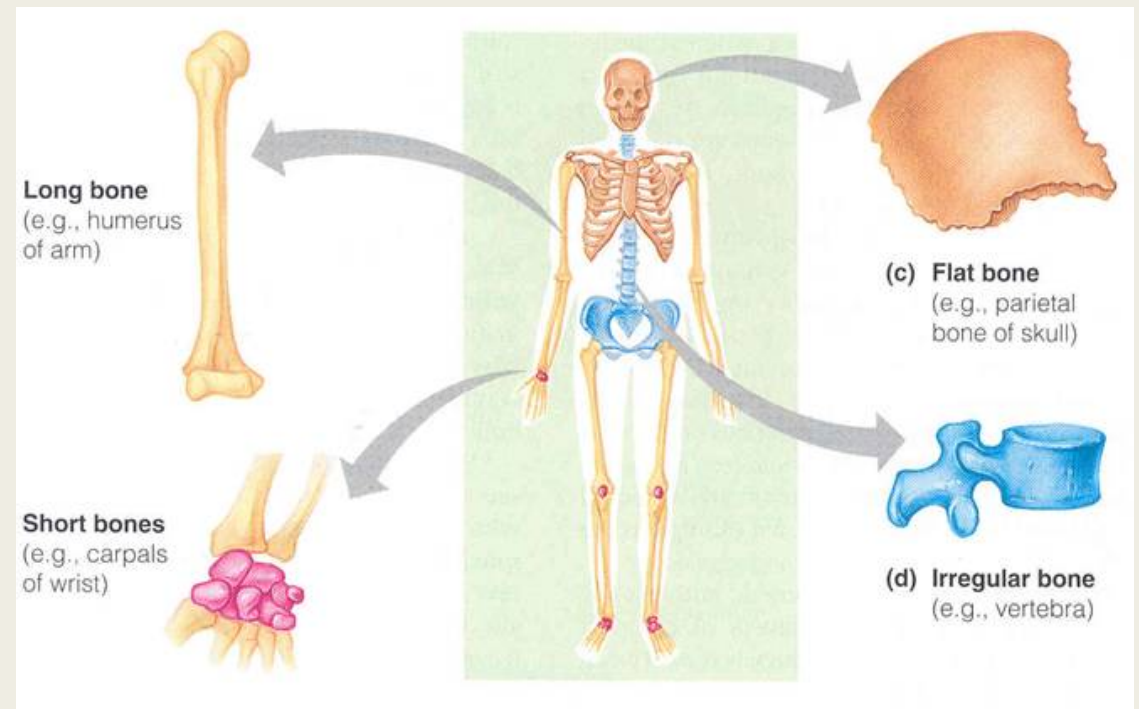
- Compact,

- Spongy.

- **Development:**

- Membrane,

- Cartilage.



THE SKELETON

❑ Formed of **206** bones.

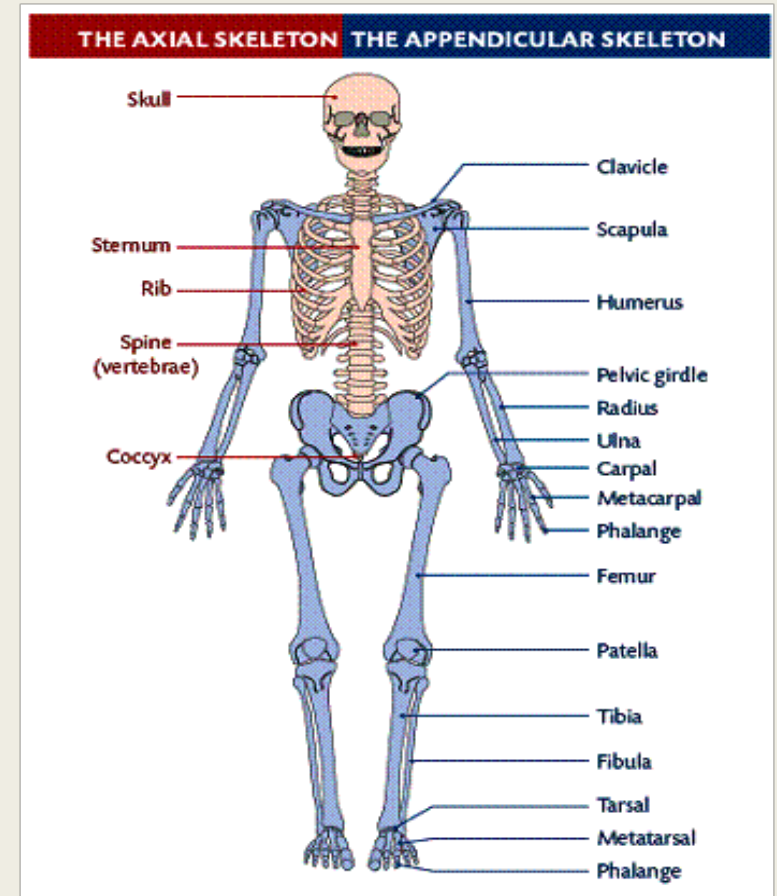
❑ Divided into:

1. Axial skeleton:

Bones forming the trunk (longitudinal axis) of body.

2. Appendicular skeleton:

Bones forming the girdles & limbs.



BONES OF AXIAL SKELETON

SKULL

❑ **Consists of:**

❑ **Cranium:**

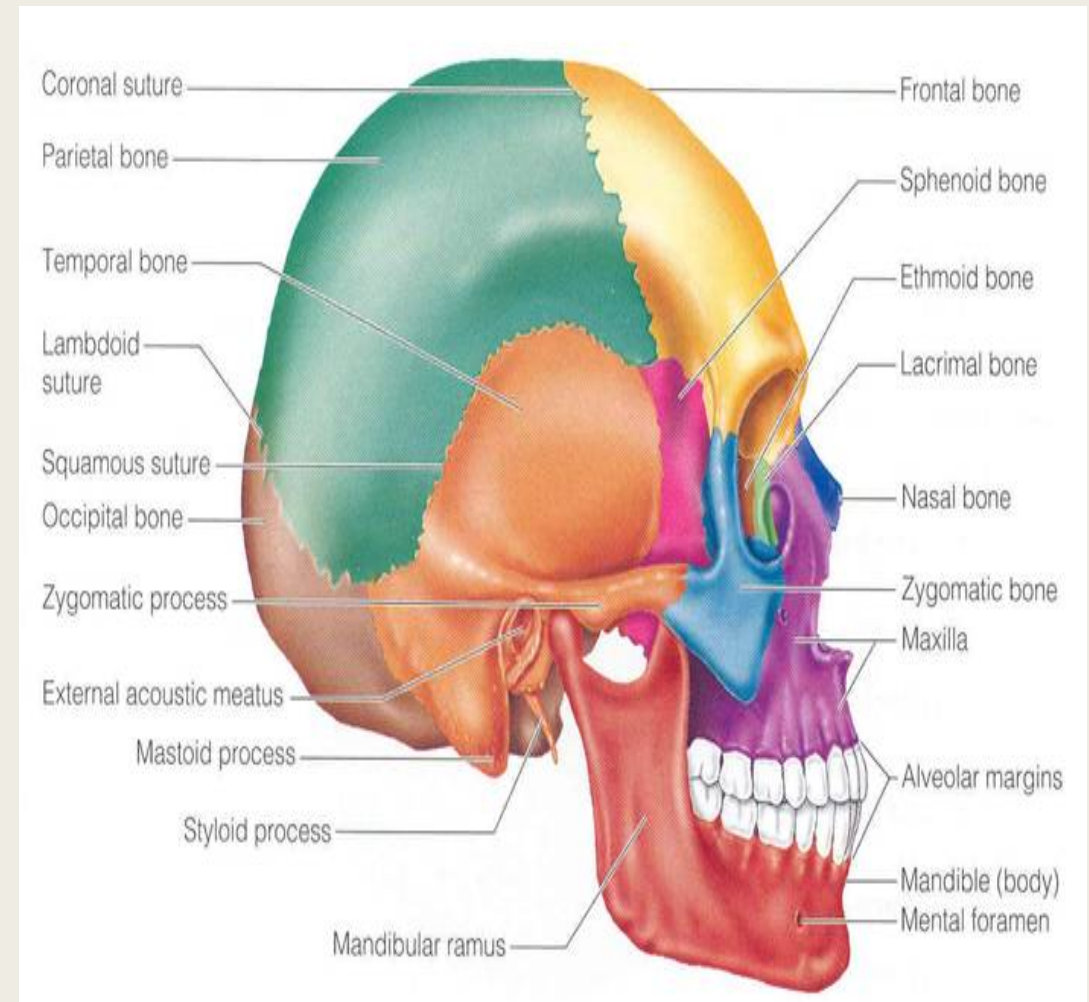
bones enclosing brain:

- Frontal
- Occipital
- Parietal
- Temporal

❑ **Facial bones:**

bones of face:

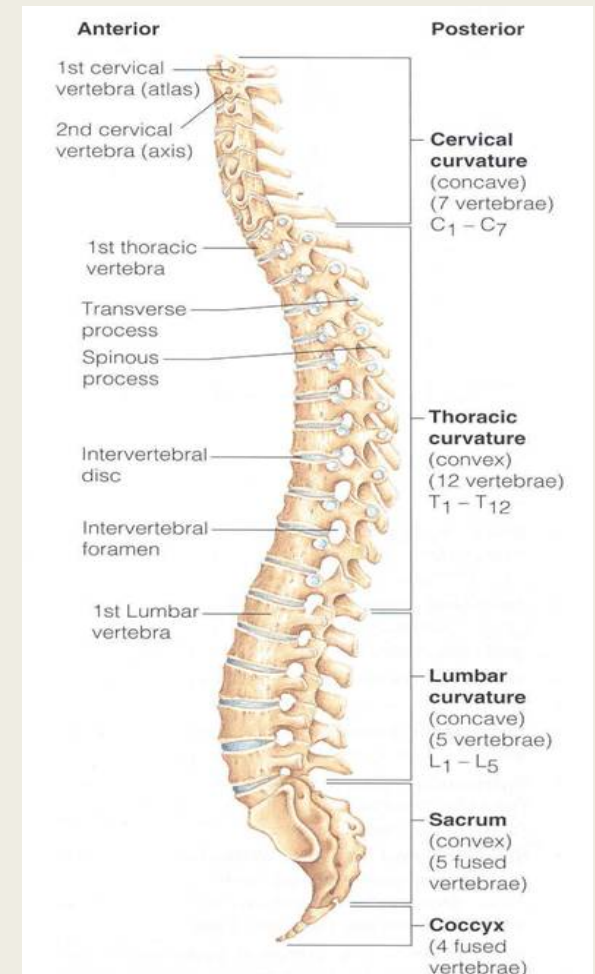
- Maxilla
- Nasal
- Zygomatic
- Mandible.



BONES OF AXIAL SKELETON

VERTEBRAL COLUMN

- ❑ **Number:** 33 vertebrae.
- ❑ **Functions:** protects spinal cord and supports the body.
- ❑ **Formed of:**
 - ❑ 7 cervical vertebrae.
 - ❑ 12 thoracic vertebrae.
 - ❑ 5 lumbar vertebrae.
 - ❑ 5 sacral vertebrae fused to form sacrum.
 - ❑ 4 coccygeal vertebrae fused to form coccyx.



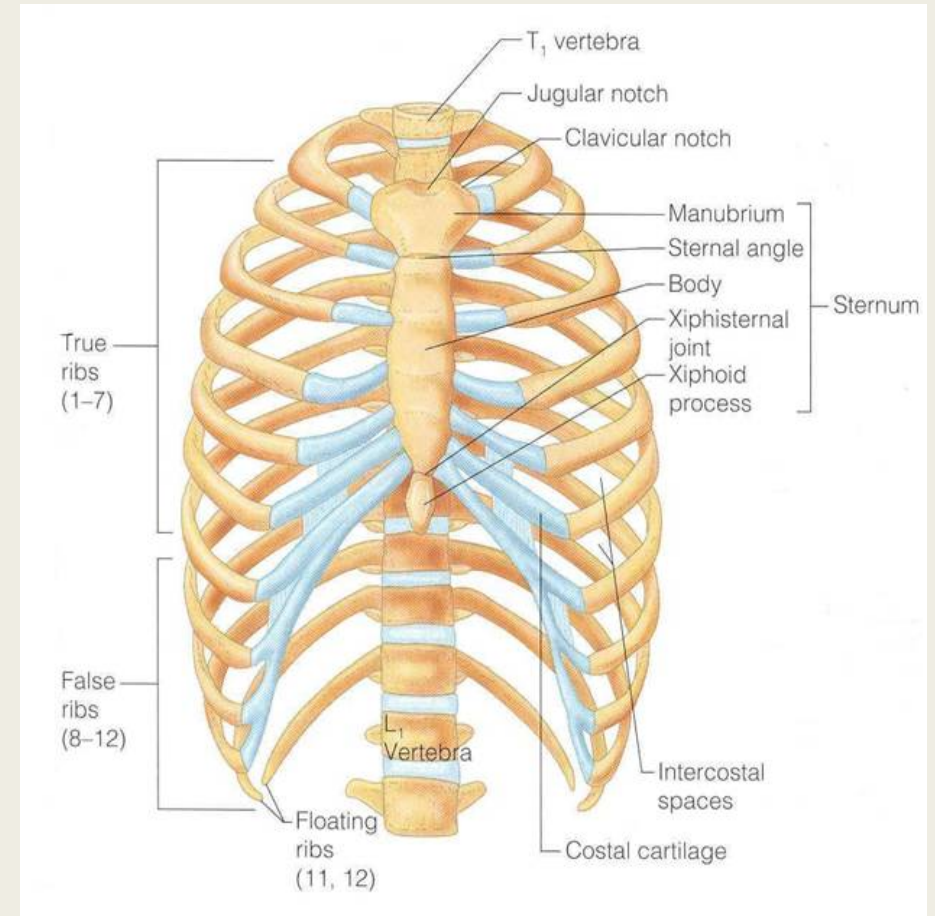
BONES OF AXIAL SKELETON

STERNUM

- ❑ Has 3 parts:
- ❑ Manubrium,
- ❑ Body &
- ❑ Xiphoid process.

RIBS

- ❑ 12 pairs:
- ❑ All ribs articulate with vertebrae.
- ❑ Only upper 7 pairs articulate with sternum, (true ribs).
- ❑ 8th, 9th & 10th ribs are false ribs.
- ❑ 11th & 12th ribs are floating ribs.



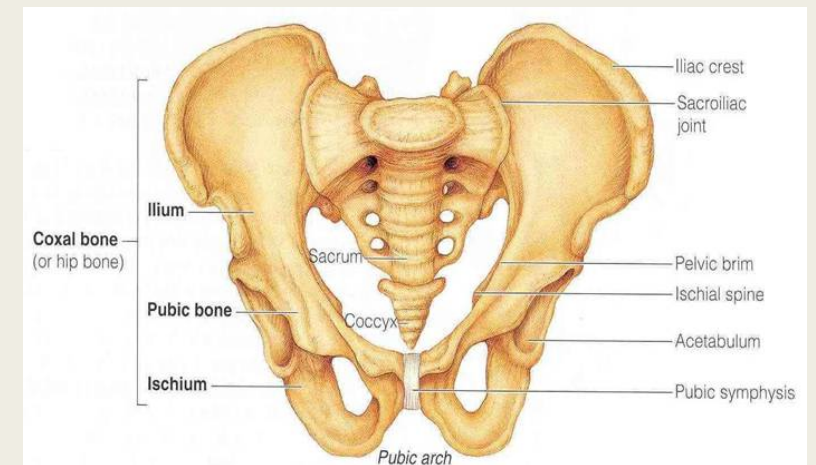
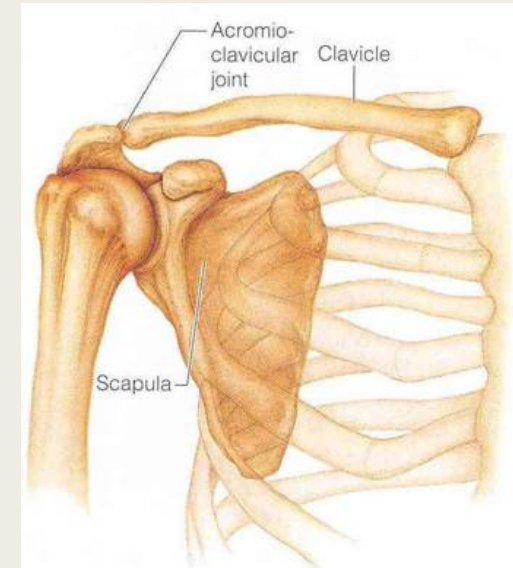
BONES OF APPENDICULAR SKELETON

PECTORAL GIRDLE

- ❑ Connects upper limb with axial skeleton.
- ❑ Formed of:
- ❑ Clavicle &
- ❑ Scapula.
- ❑ (2 bones on each side)

PELVIC GIRDLE

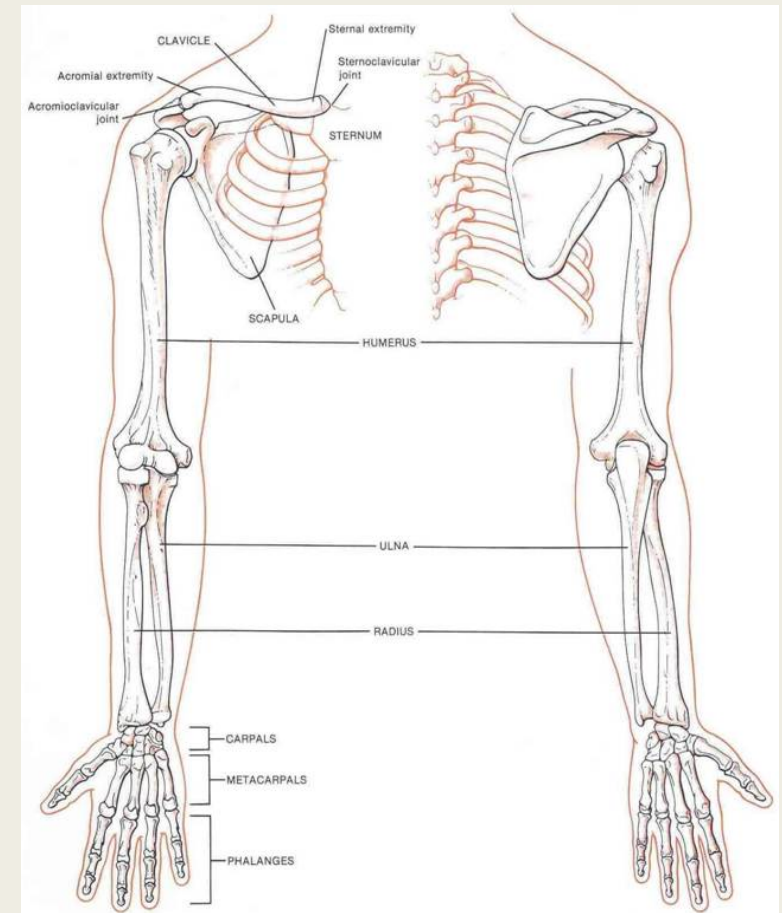
- ❑ Connects lower limb with axial skeleton.
- ❑ Formed of:
- ❑ Hip bone,
- ❑ (one only on each side).



BONES OF APPENDICULAR SKELETON

UPPER LIMB

- ❑ **Bone of arm:**
- ❑ **Humerus.**
- ❑ **Bones of forearm:**
- ❑ **Radius (lateral) &**
- ❑ **ulna (medial).**
- ❑ **Bones of the hand:**
- ❑ **8 carpal bones.**
- ❑ **5 metacarpal bones.**
- ❑ **14 phalanges:**
- ❑ **2 for thumb &**
- ❑ **3 for each of medial 4 fingers.**



BONES OF APPENDICULAR SKELETON

LOWER LIMB

Bone of thigh:

Femur.

Bones of leg:

Fibula (lateral) &

Tibia (medial).

Patella.

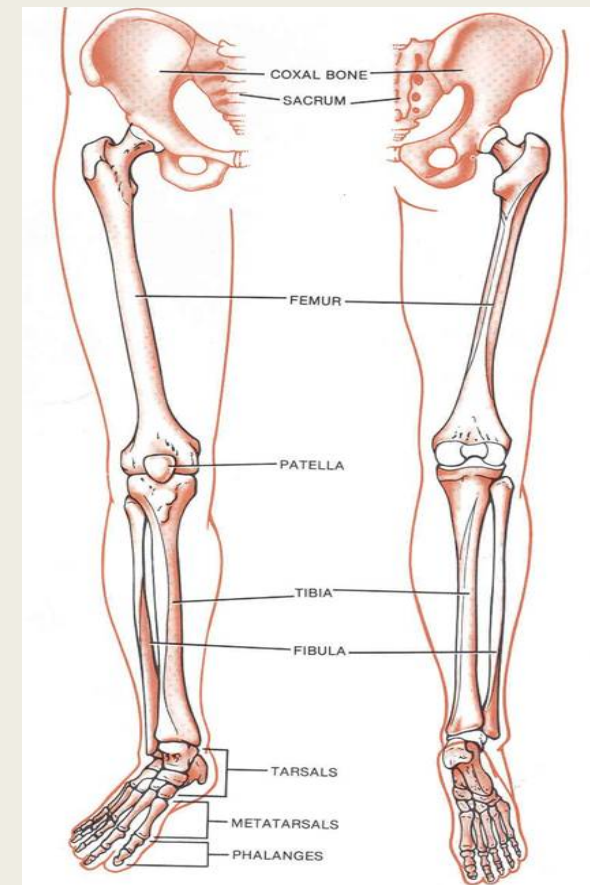
Bones of foot:

7 tarsal bones.

5 metatarsal bones.

14 phalanges:

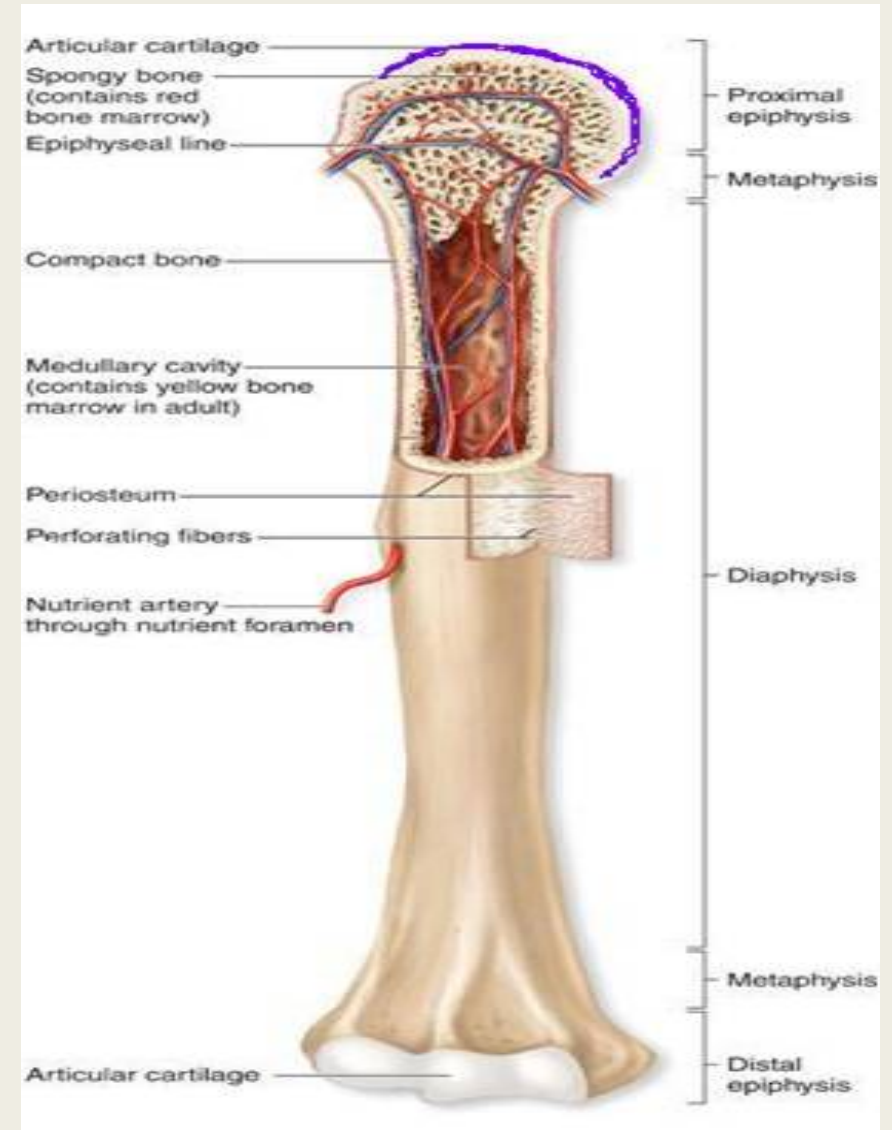
2 for big toe & 3 for each of lateral 4 toes.



LONG BONES

Formed of:

- ❑ **A shaft (diaphysis):** composed of compact bone.
- ❑ **Two ends (epiphysis):** composed of spongy bone.
- ❑ **Metaphysis:** This is the region of contact between epiphysis & diaphysis.
- ❑ **The metaphysis** contains *epiphyseal plate of cartilage* responsible for *linear bone growth*.



TEST YOURSELF!

- Which one of the following bones is a bone of the axial skeleton?
 1. Femur.
 2. Humerus.
 3. Scapula.
 4. Sternum.

■ Which one of the following bones is an example of an irregular bone?

1. Femur.
2. Vertebra.
3. Scapula.
4. Sternum.

- Which one of the following planes divides the body into superior & inferior parts?
 1. Frontal (coronal) plane.
 2. Sagittal (median) plane.
 3. Parasagittal (Paramedian) plane
 4. Transverse (cross) plane.

GOOD LUCK