ANATOMY

Lecture 1 :

Anatomical terms and skeletal systems

Guide

- Text in pink was only found in the girl's slides
- Text in blue was only found in the boy's slides
- Text in red is considered important
- The Dr.'s comments in class are written in green

Objectives

- 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.

ANATOMY, and it's Sciences

The science which deals with the study of the:

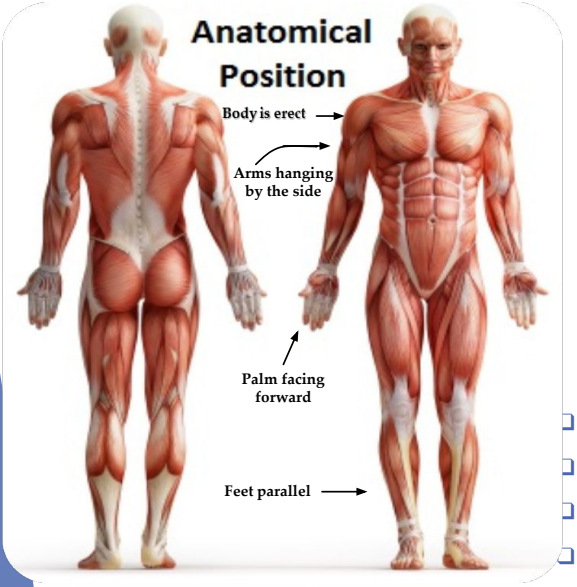
- **Structure and Shape of the body.**
- **Body parts & their Relationship to one another.**

ANATOMICAL SCIENCES:

- **Gross 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.**
- **Cross-sectional Anatomy.**
- **Applied Anatomy.**
- **Surgical Anatomy.**

تم ذكر هذين النوعين على أنهن نوع واحد في سلايدات البنات

The Language Of Anatomy
(Anatomical Terminology)



- To prevent misunderstanding, a special set of terms are used to describe the Identification and Location of the body.
- To accurately describe body parts, the body is in a standard position called the:

ANATOMICAL POSITION, in which:

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 Parallel

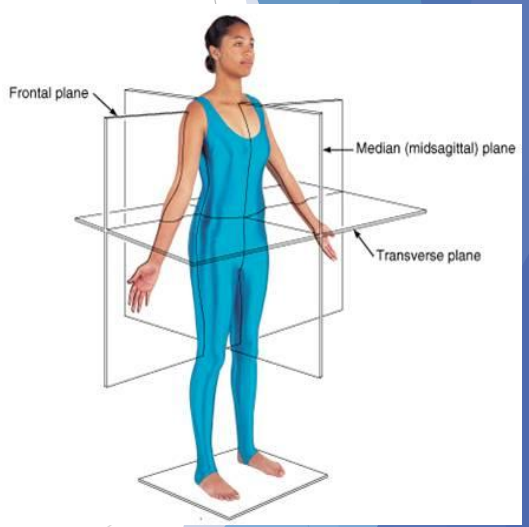
لا يُمكن دراسة العلاقات بين أجزاء الجسم و مواقعها بدون تحديد شكل معيّن ثابت للجسم.

ANATOMICAL PLANES & SECTIONS

An imaginary line that cuts through the body wall is called a (**plane**)

There are four types of imaginary planes:

- Sagittal (median): divides the body into 2 equal halves (right & left) , it is vertical plane and passes through the center of the body
- Parasagittal (paramedian): divides the body into 2 unequal parts (right & left)
- Frontal (coronal): divides the body into anterior & posterior parts , it is vertical plane.
- Transverse (cross) (horizontal): divides the body into superior & inferior parts , it is also called cross section



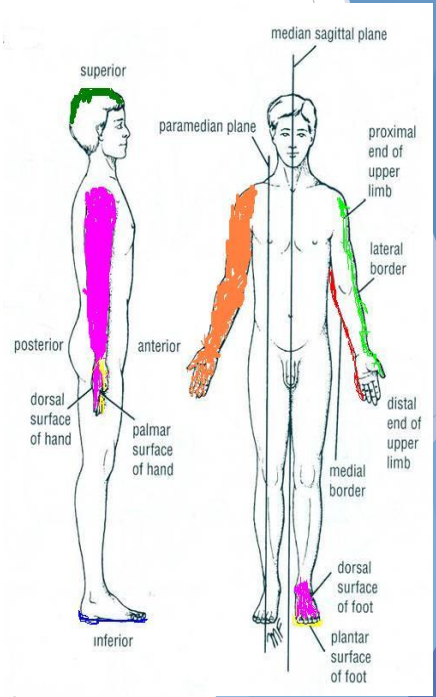
TERMS OF POSITION

- Superior (cranial) (rostral): near to head
- Inferior (caudal): away from head
- Supine: The body lies on the back
- Prone: The face is downwards
  - Anterior (ventral) : near to front
  - Posterior (dorsal) : near to back
    - Medial: near to median plane
    - Lateral: away from median plane
      - Proximal: near to trunk (used for the limbs)
      - Distal: away from trunk (used for the limbs)
        - Superficial (external) : near to skin (surface)
        - Deep (internal) : away from skin

Special cases:

Hand:
Anterior: Palmar
Posterior: Dorsal

Foot:
Anterior: Planter
Posterior: Dorsal



TERMS OF MOVEMENT

Flexion: approximation of 2 parts(decreasing the angle between 2 parts). It is usually anterior except in the knee joint and the opposite for the extension. Every flexion has an extension.

Extension: straightening (increasing the angle between 2 parts) Usually a posterior movement

Abduction: away from median plane

Adduction: toward median plane

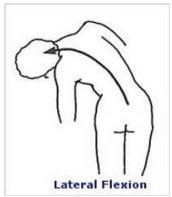
For the limb

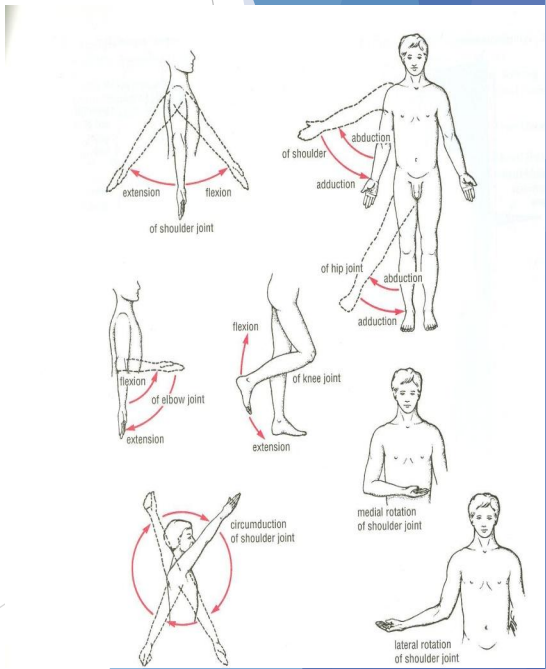
Lateral rotation: rotation away from median plane

Medial rotation: rotation towards median plane

Circumduction: combined movements of flexion, extension , abduction & adduction

Lateral flexion: Side movement of the trunk

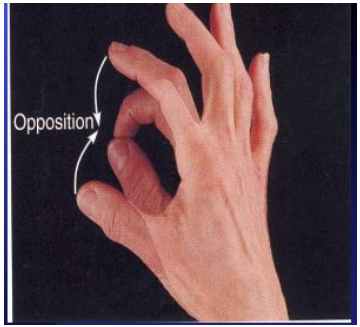




Movements of hand

من سلايدات البنات

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

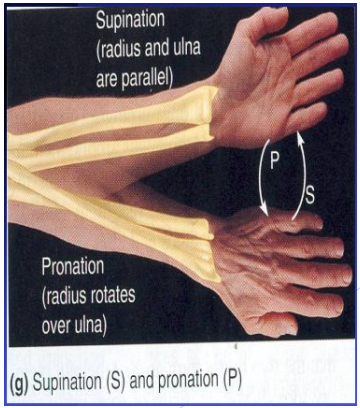


■ Supination:

- Lateral rotation of the forearm.
- The palm faces Anteriorly.
- The radius and ulna are Parallel.

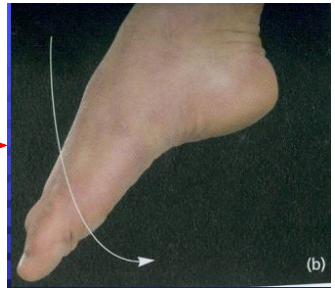
■ Pronation:

- Medial rotation of the forearm.
- The palm faces Posteriorly
- The radius Crosses the ulna and the two bones form an x



Movements of foot

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



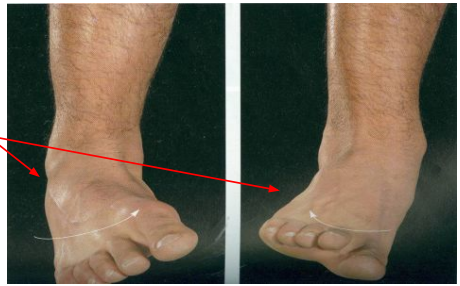
- Dorsiflexion
  - Up movement of the foot
  - (Standing on the heels)

- Inversion :

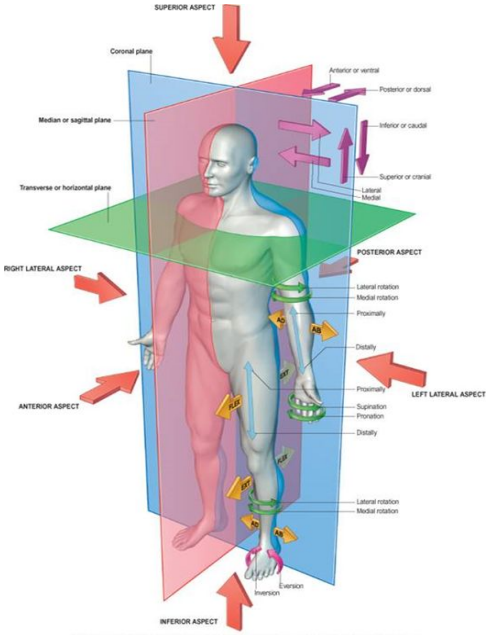
The sole faces in a Medial direction.

Eversion :

The sole faces in a Lateral direction.



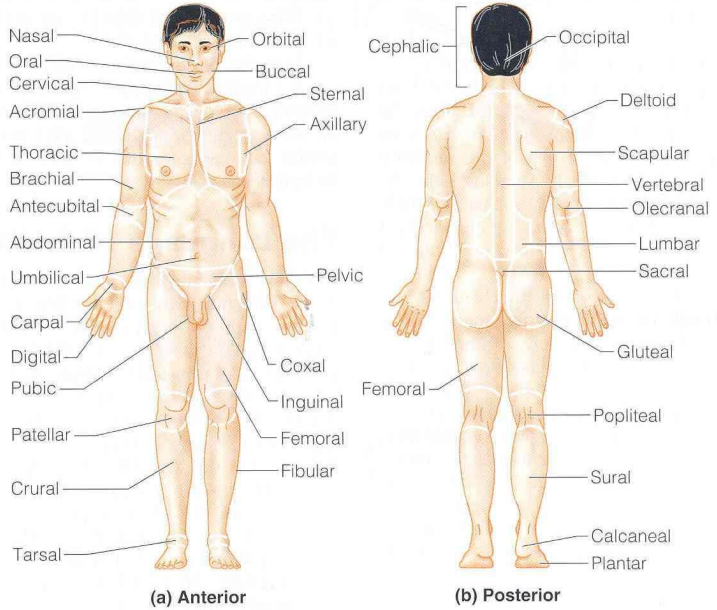
PLANES, TERMS OF POSITION & TERMS OF MOVEMENT



Terms of Regions

خاص بسلايدات البنات

- Cranial (Cephalic) region of head
- Cervical region of neck
- Thoracic region of chest
- Abdominal
- Pelvic
- Planter region of feet
- Palmer



BODY CAVITIES

The body has two sets of internal cavities that lodge and protect the organs. Which are Dorsal & Ventral.

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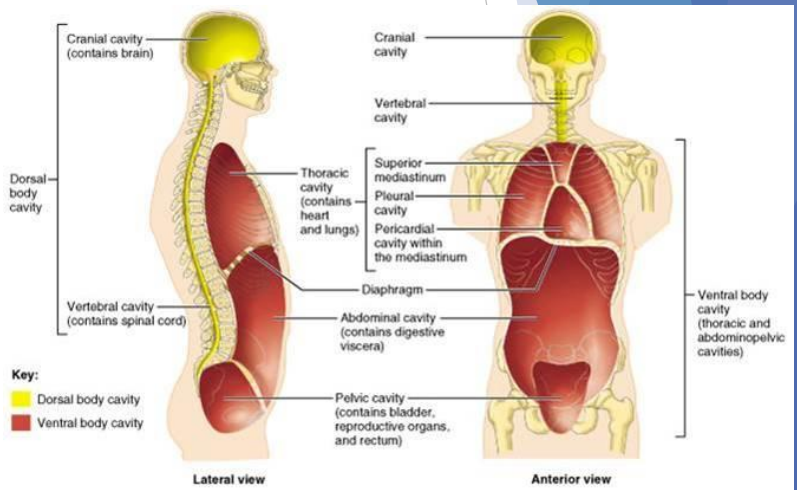


BODY CAVITIES

Ventral body cavity

divided by diaphragm into:

- **Thoracic cavity: lies** superior to diaphragm, contains heart & lungs
- **Abdominal cavity: lies (below)** inferior to diaphragm, contains stomach, intestine, liver, urinary bladder .rectum , reproductive organs,, etc…

Dorsal body cavity

divided into 2 parts continuous with each other:

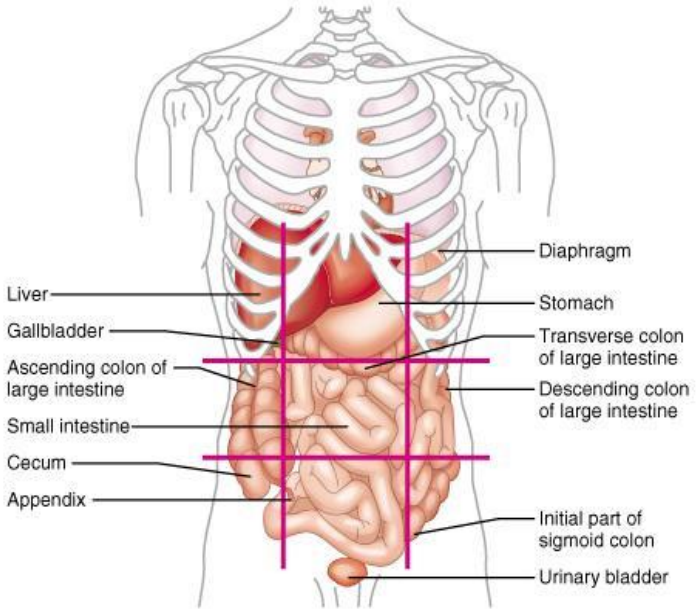
- **Cranial cavity**: space inside skull, contains brain
- **Spinal cavity:** space inside vertebral column, contains spinal cord.

Abdominopelvic regions (girls slides only)

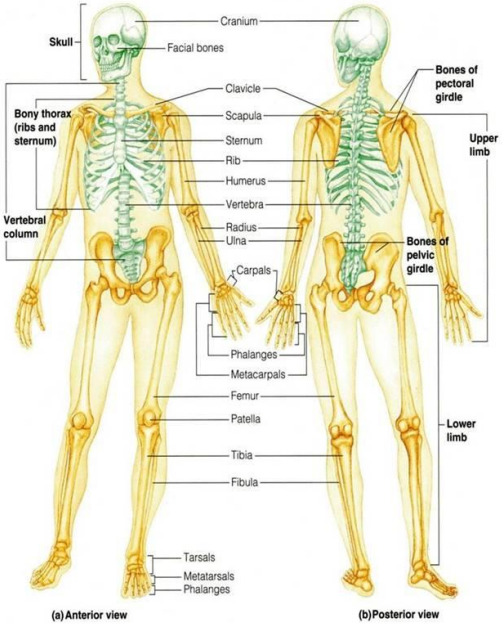
The

Abdominopelvic
area is divided into 9 regions by 2 vertical & 2 horizontal lines or planes

Objective: To locate the different organs in each region



SKELETAL SYSTEM



Includes:

1-Bones

2-Joints:

articulations between bones

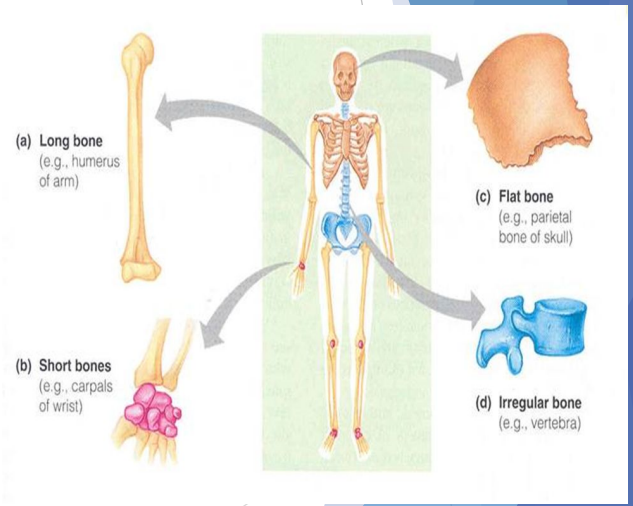
FUNCTIONS OF BONE

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

CLASSIFICATION OF BONE

Bones are classified base on their:

- **Shape: long, short, flat, irregular**
- **Structure: compact, spongy**
- **Development: membrane or Membranous, cartilage or Cartilagenous**
- N.B There is an additional classification in terms of shape which is sutural and sesamoid bones e.g: patella in the knee joint is a sesamoid bone.



For further understanding of classifications:

Important: Knowing the shapes of the bones

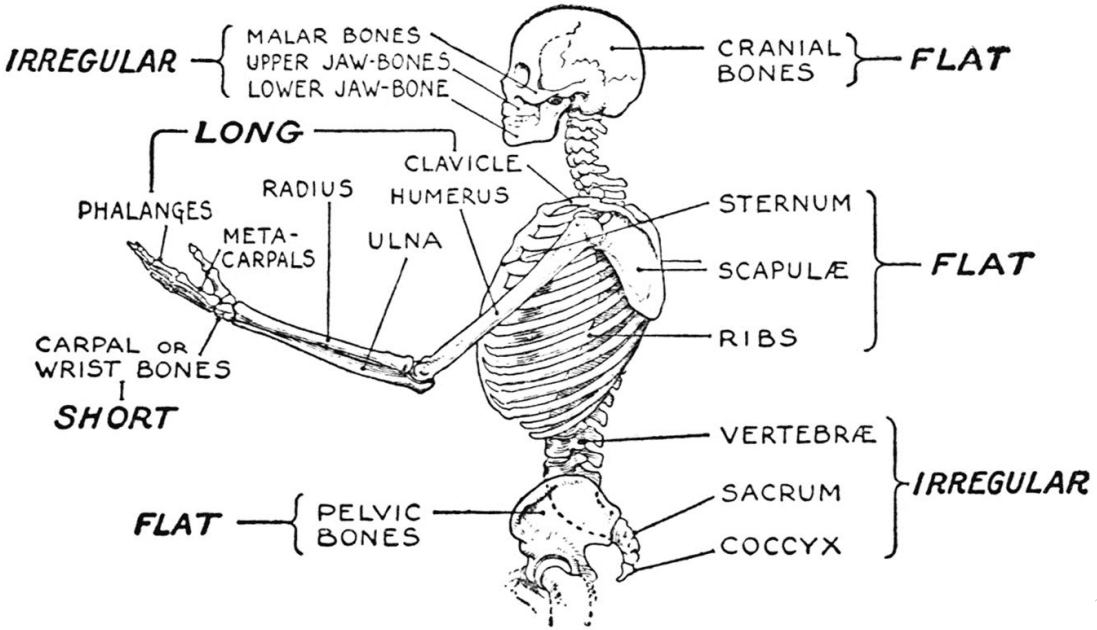
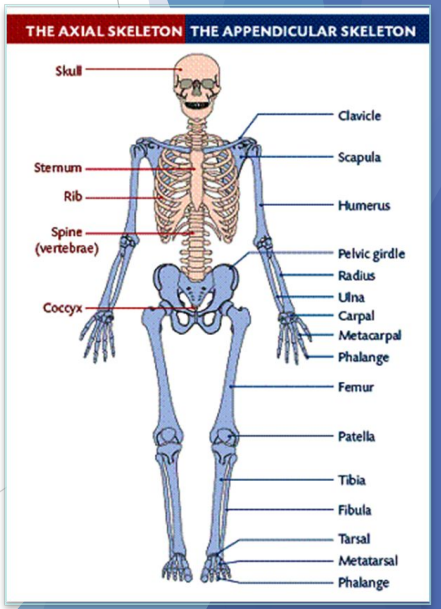


DIAGRAM TO ILLUSTRATE THE FOUR CLASSES OF BONES.

THE SKELETON

- There are 206 bones in our body, arranged to form the body framework called, the skeleton.
- The skeleton is perfectly adapted to the functions of body protection and motion.
- **Axial skeleton: bones forming the trunk (longitudinal axis) of body** The Axial Skeleton consists of the (Skull bones,Vertebral colum,Sternum,Ribs)
- **Appendicular skeleton: bones forming the girdles & limbs,** consists of the bones of the (Pectoral & Pelvic Girdles :connect the bones of the limbs to the axial skeleton
- ,Upper Limb ,Lower Limb)



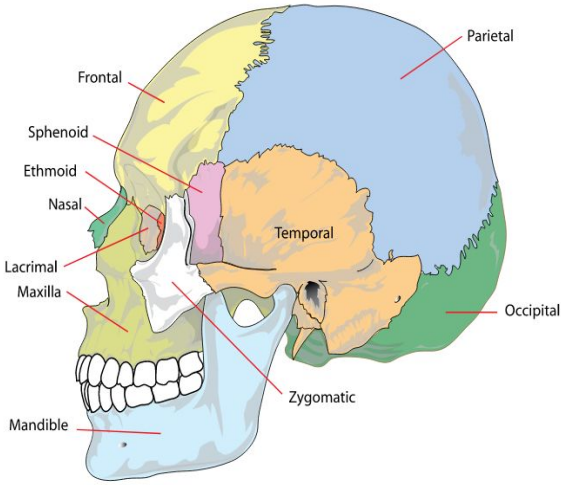
BONES OF AXIAL SKELETON

SKULL

❑**Consists of:**

1. **Cranium: bones enclosing brain:** ***frontal, occipital, parietal, temporal ,*** Sphenoid
2. **Facial bones: bones of face:** ***maxilla, nasal, zygomatic, mandible***

الدكتور ما طلب حفظ أسامي العظام اللي باللون الأخضر لكن أنصح بحفظها احتياط ايضًا بتكون مفيدة جدًا في البلوك الجاي



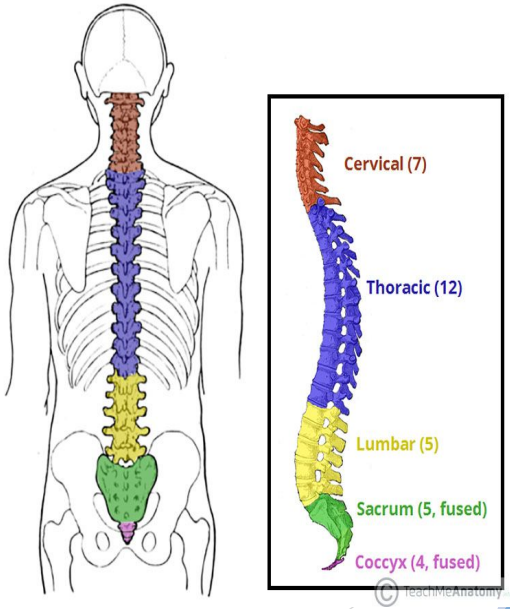
BONES OF AXIAL SKELETON

VERTEBRAL COLUMN

- ❑Number: 33 vertebrae
- ❑Functions: protects spinal cord and supports the body
- ❑Forms the axial support of the body
- ❑ Is a flexible curved structure, formed of 33 irregular bones, the (vertebrae)
- ❑ Running through its cavity is the spinal cord
- ❑Formed of:

1. 7 cervical vertebrae
2. 12 thoracic vertebrae
3. 5 lumbar vertebrae
4. 5 sacral vertebrae fused to form sacrum
5. 4 coccygeal vertebrae fused to form coccyx

Sacrum + coccyx
متحدة لكنها لا تعتبر عظمة واحدة



BONES OF AXIAL SKELETON

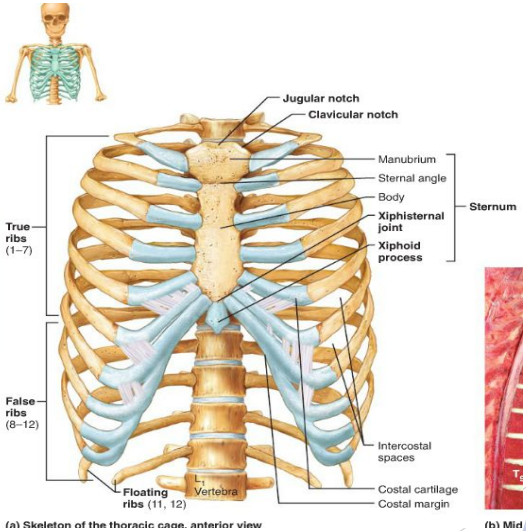
STERNUM (Flat bone)

- **Has 3 parts: *manubrium, body & xiphoid process***

RIBS

Long bone

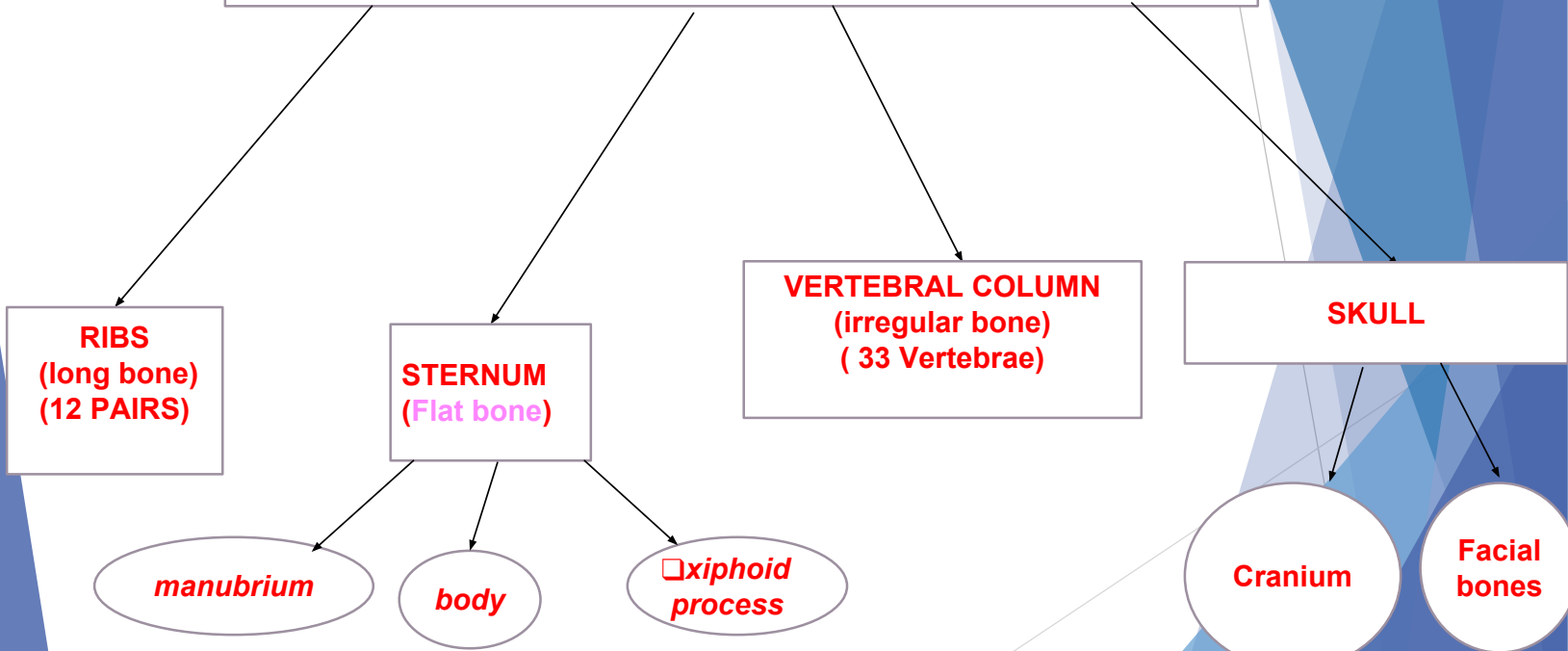
- **Number: 12 pairs (1-7 true RIBS connected to the stenrum , 8-10 false RIBS (Not connected directly) , 11-12 floating RIBS)**
- **All ribs articulate with vertebrae**
- **Only upper 7 pairs articulate with sternum**



(a) Skeleton of the thoracic cage, anterior view

(b) Mid

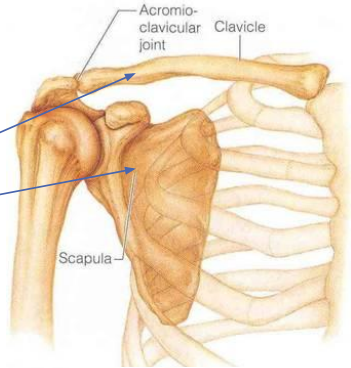
BONES OF AXIAL SKELETON



BONES OF APPENDICULAR SKELETON

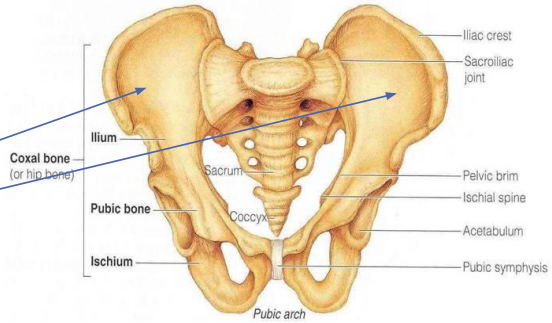
Pectoral Girdle

- Connects Upper limb with axial skeleton
- Formed of: ***Clavicle*** & ***Scapula***



- Pelvic Girdle

1. **Connects lower limb with axial skeleton**
2. **Formed of: hip bone (one bone on each side)**

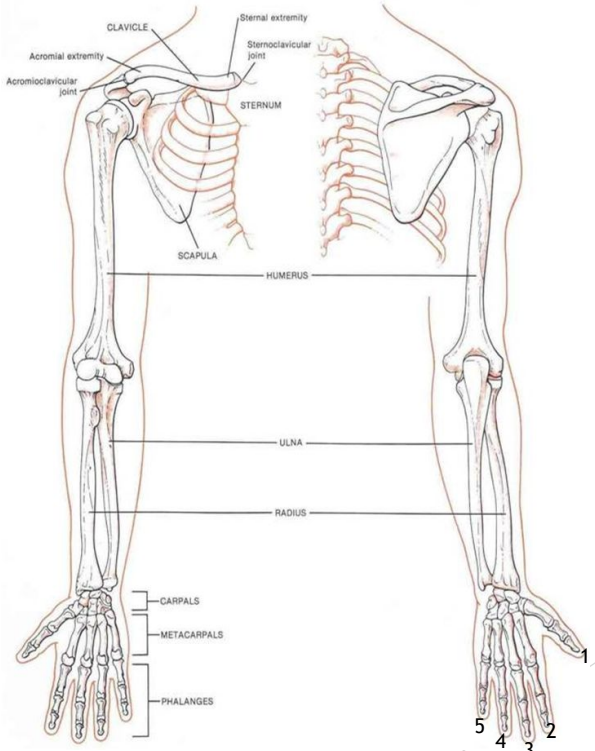


BONES OF APPENDICULAR SKELETON

UPPER LIMB

- Bone of arm: ***humerus*** ***(humerus is*** **Proximal to the forearm)**
- Bones of forearm: ***radius*** **(lateral)** & ***ulna*** **(medial)**
- Bones of hand:

1. **8 carpal bones**
2. **5 metacarpal bones (يتم ترقيم الميتا كاربل من الخارج للداخل)**
3. **14 phalanges: 2 for the thumb & 3 for each medial finger**

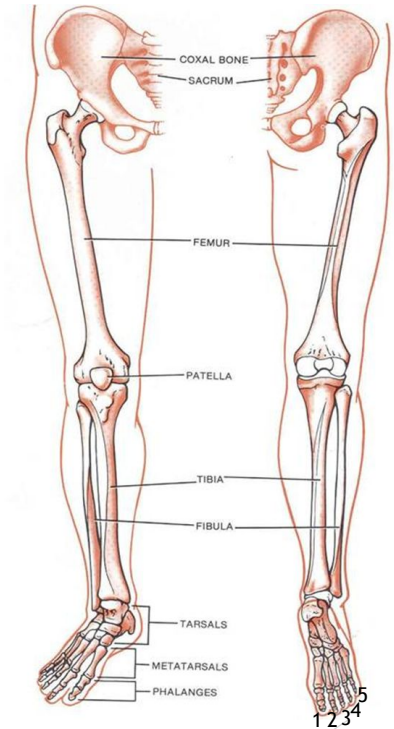


BONES OF APPENDICULAR SKELETON

LOWER LIMB

- Bone of thigh: ***femur***
- Bones of leg: ***fibula*** (lateral) & ***tibia*** (medial)
- ***Patella***
- Bones of foot:

1. **7 tarsal bones**
2. **5 metatarsal bones**(يتم الترقيم من الداخل للخارج نبدا الترقيم من الاصبع الأكبر)
3. **14 phalanges: 2 for big toe & 3 for each of lateral 4 toes**

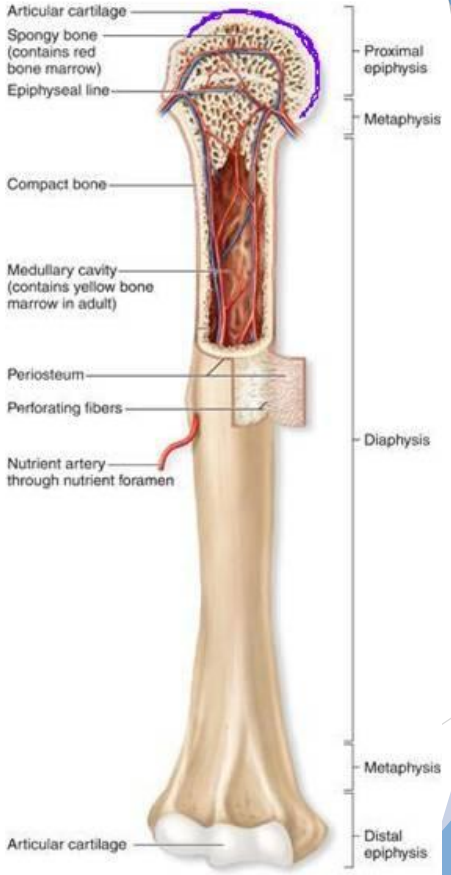


LONG BONES

Formed of:

1. A shaft (diaphysis) :

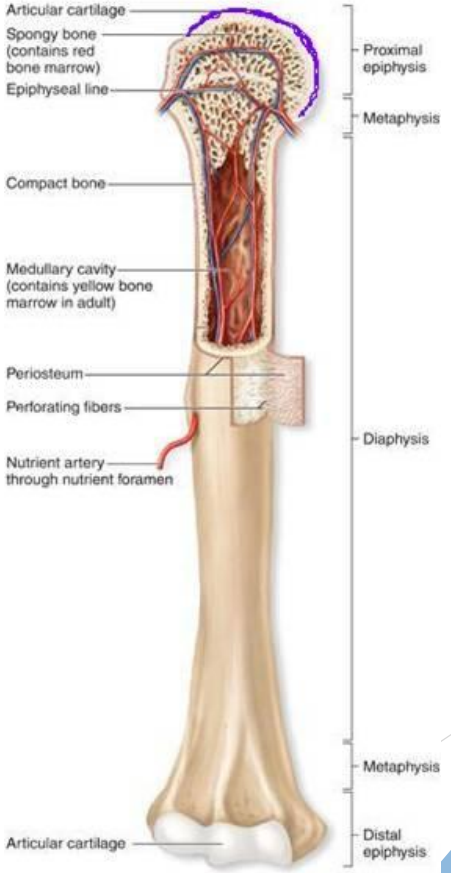
- Composed of compact bone
- Covered on its external surface by a fibrous connective tissue membrane called the **periosteum**.
- Has a cavity called the **marrow cavity**. In adults, the marrow cavity is a storage area for fat and contains marrow. In infants, it contains red marrow and is the site of blood cells formation



LONG BONES

2. Two ends (epiphysis):

- composed of spongy bone
- Each epiphysis is composed of spongy bone, lined by a thin layer of compact bone.
- Its external surface is covered by a layer of hyaline cartilage called the **articular cartilage**
- Articular cartilage provides smooth slippery surface that decreases friction at joint surfaces

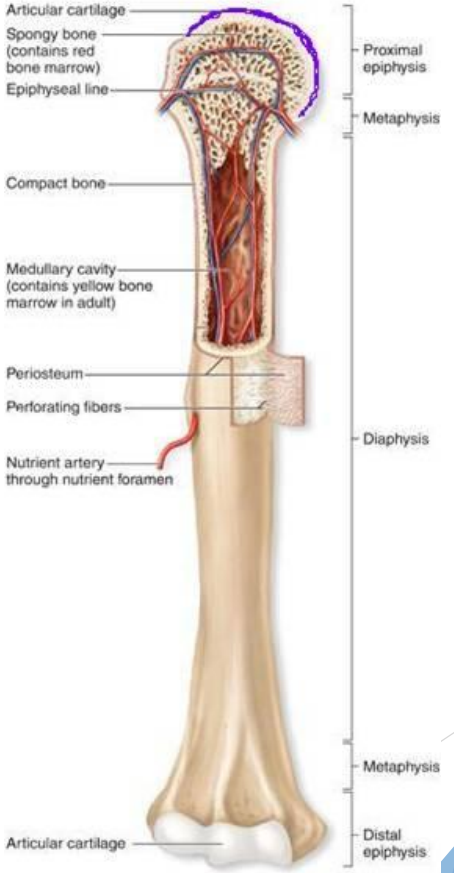


LONG BONES

3. Metaphysis:

- The region of contact between epiphysis & diaphysis

- Contains epiphyseal plate (thin plate of cartilage) responsible for linear bone growth (lengthwise growth of the long bones).

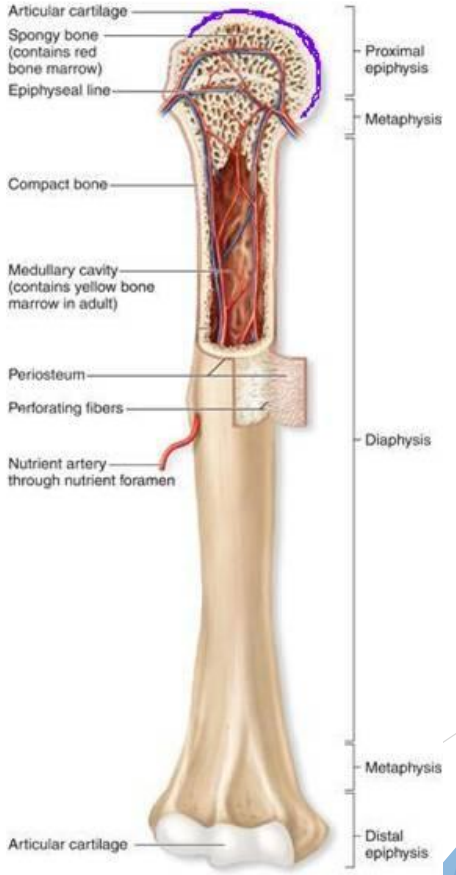


LONG BONES

Role of Periosteum

- Protects the bone
- Gives attachment to muscles
- Carries blood vessels and nerves to bone
- Deposits new bone on the surface thus increases the girth of bone

Growth of bone
- Increase in length: epiphyseal plates
- Increase in girth: periosteum



QUESTIONS

Question 1:
Gross Anatomy is the study of human body with a:

A- Light Microscope

B- Naked Eye

C- Electron Microscope

Question 2:

What does (Rostral) means?

A. Inferior

B. Anterior

C. Superior

D. Posterior

Question 3:

Extension is usually posterior except?

A. Elbow joint

B. Knee joint

C. Finger joint

Question 4:

Cross plane divides the body into?

A.superior & inferior

B.anterior & posterior

C.superior & posterior

D.left & right

Question 5:

Sternum bone is classified in terms of shape :

A) Irregular

B) Flat

C) Long

D) Short

- 1. B
- 2. C
- 3. B
- 4. A
- 5. B

لا تنسونا من دعائكم و نسأل الله لنا و لكم التوفيق

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