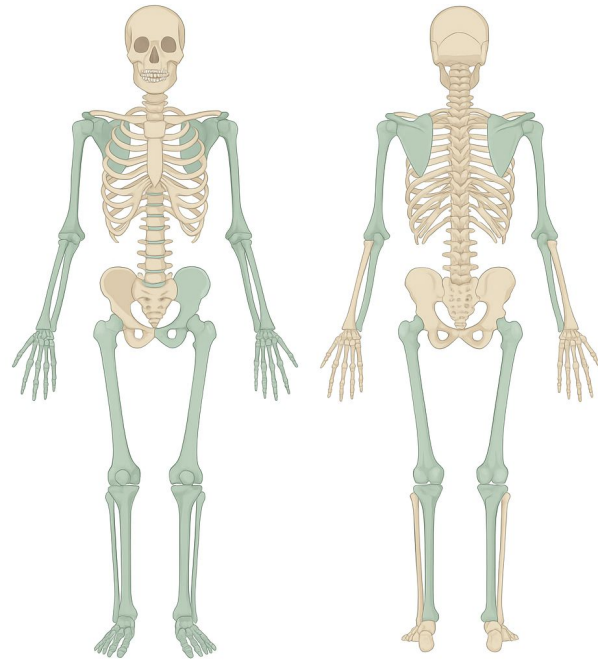
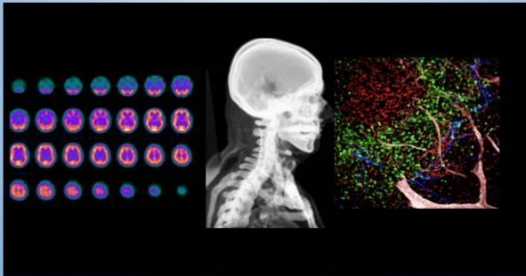


Skeletal System: Divisions and Major Bones

Introduction to Human Anatomy
& Physiology: A Multilingual
Approach

An Open Educational Resource

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Ann DeChenne, Kiana Pigao, Zach
Ellsworth



[Figure 7.2](#) by OpenStax A&P

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Lesson 2: Divisions of the Skeletal System

Learning Objective:

- Identify the major components of the skeletal system by division and by anatomical name.



See the Skeletal System Wordlist!

- Can be found in accompanying materials to this lecture
- Materials are available in English, Spanish, Russian, Vietnamese, Filipino, East African French, Kiswahili (Swahili) and Chinese.

Module 3 Skeletal System Word List

Microscopic Anatomy

Bone Matrix
Compact Bone
Lacunae (containing Osteocytes)
Lamellae
Osteon
Central canal
Spongy bone

Bone cells:

Osteoblasts
Osteocytes
Osteoclasts

Cranium (Skull):

Occipital Bone
Temporal Bone
Parietal Bone
Frontal Bone
Sphenoid Bone
Nasal Bone
Zygomatic Bone
Maxilla
Mandible
Ethmoid Bone
Vomer Bone

Palatine Bone
Paranasal Sinuses

Axial Skeleton: Vertebral Column

Intervertebral disc
Atlas (C1)
Axis (C2)
Cervical Vertebrae (C1-C7)
Thoracic Vertebrae (T1-T12)
Lumbar Vertebrae (L1-L5)
Sacrum
Coccyx (3-5 fused vertebrae)

Thoracic Cage:

True Ribs (1-7)
False Ribs (8-12)
Sternum

Appendicular Skeleton: Upper Appendages

Clavicle
Scapula
Humerus
Ulna
Radius
Carpals
Metacarpal (5)

Phalanges of Hand
(Proximal, Middle, Distal)

Lower Appendages

Pelvis
Ilium
Pubic bone
Ischium

Femur

Patella

Tibia

Fibula

Tarsals

Metatarsal (5)

Phalanges of Foot
(Proximal, Middle, Distal)

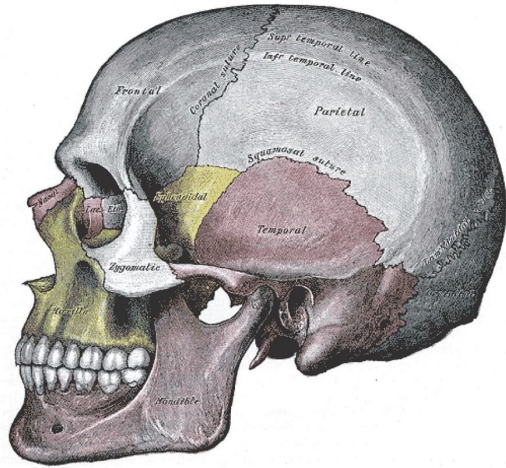
Ossification:

Intramembranous
Endochondral

Homeostatic Imbalances

Osteoarthritis
Osteoporosis

Skeletal System Bones

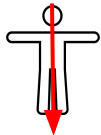


Bones vary in size, shape and strength based on their function.

Bone markings differ between bones based on the strength of the muscles that will be attaching to them.

Bones are dynamic. Their strength and thickness can be modified by internal and external factors

Axial vs Appendicular Skeleton

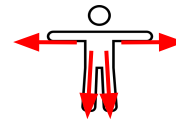
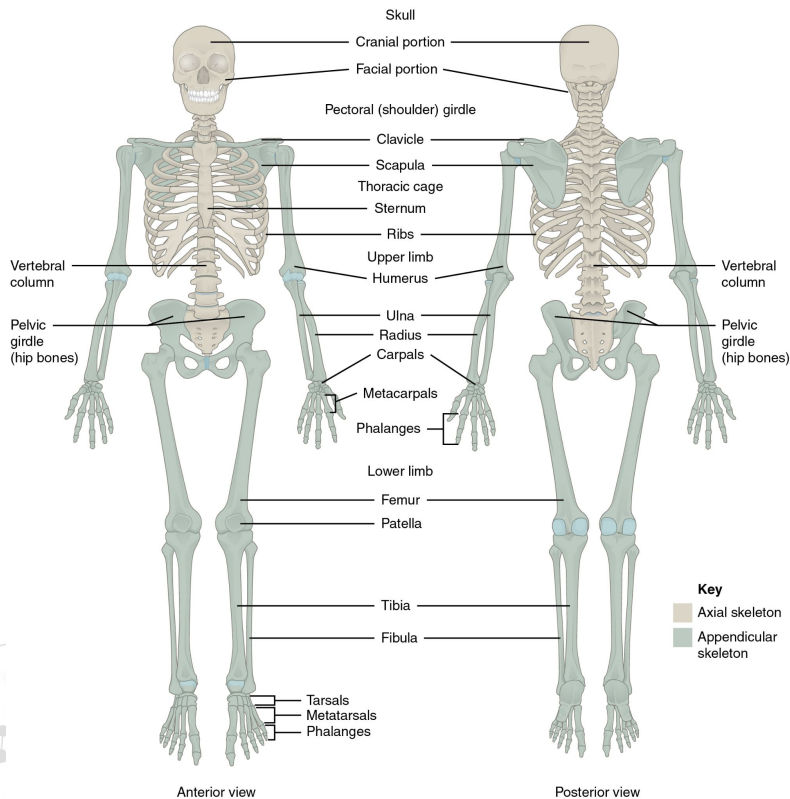


Axial Skeleton (tan)

Forms the central axis of the body.

Includes:

Skull, Vertebrae, Ribs, Sternum

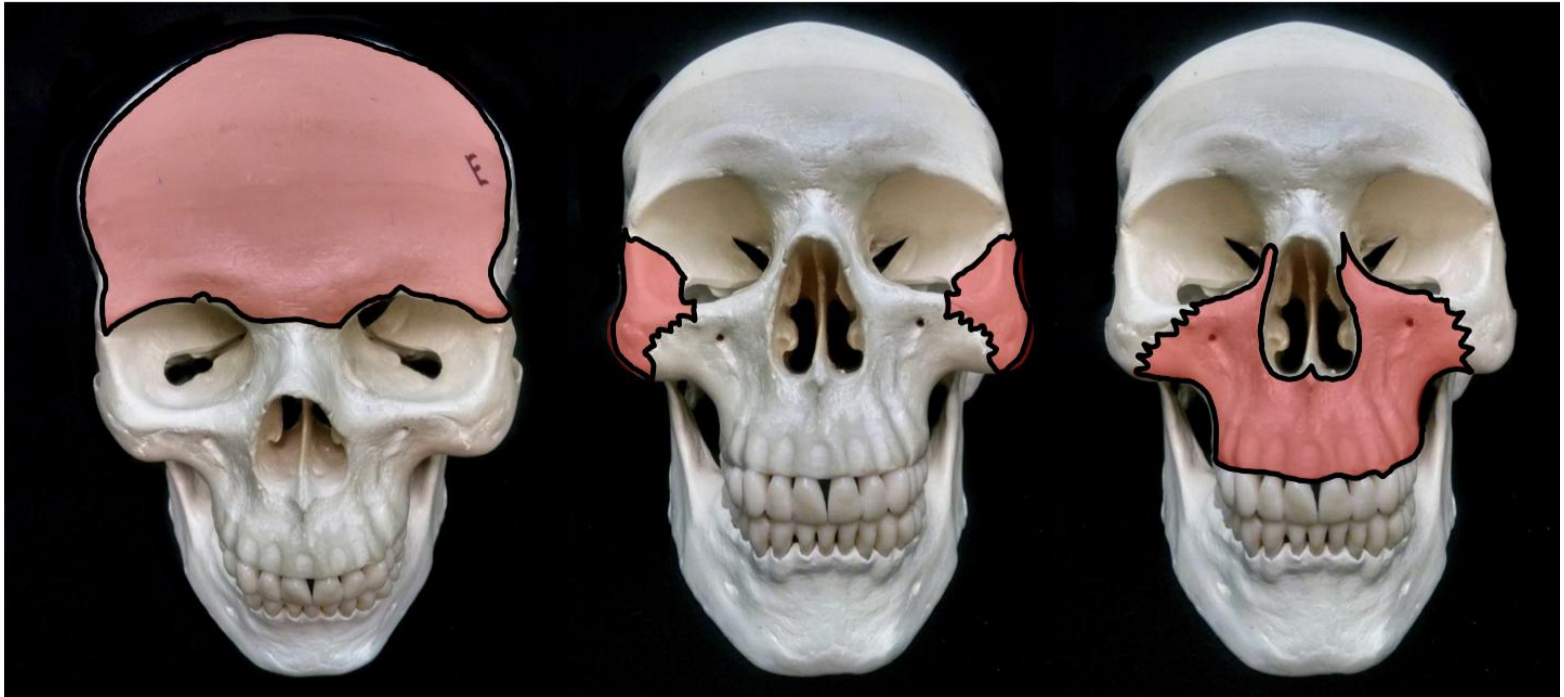


Appendicular Skeleton (blue)

Forms the appendages of the body.

Includes:

Scapula, Clavicle, Humerus, Ulna, Radius, Carpals, Metacarpals, Pelvic Girdle, Femur, Tibia, Fibula, Tarsals, Metatarsals, Phalanges



Frontal Bone

Zygomatic bone

Maxillae

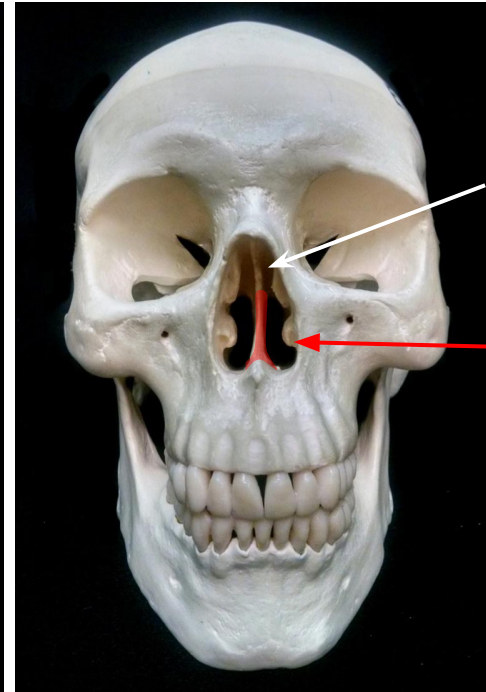
Anterior View of the Skull: Frontal, Zygomatic, Maxillae



Lacrimal bones



Nasal bones



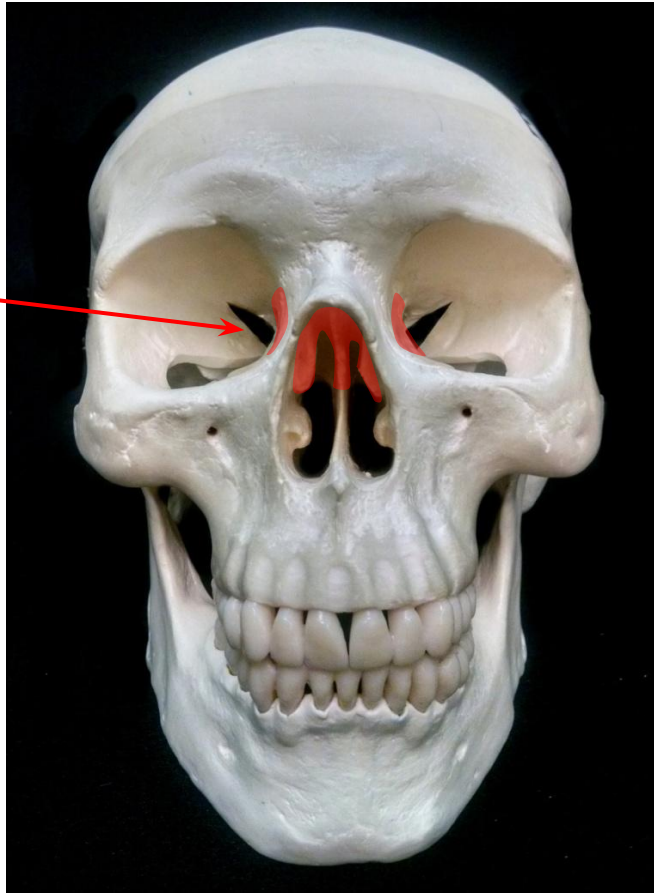
Ethmoid –
perpendicular
plate

Vomer

Anterior View of the Skull: Lacrimal, Nasal, Vomer

Axial

Ethmoid

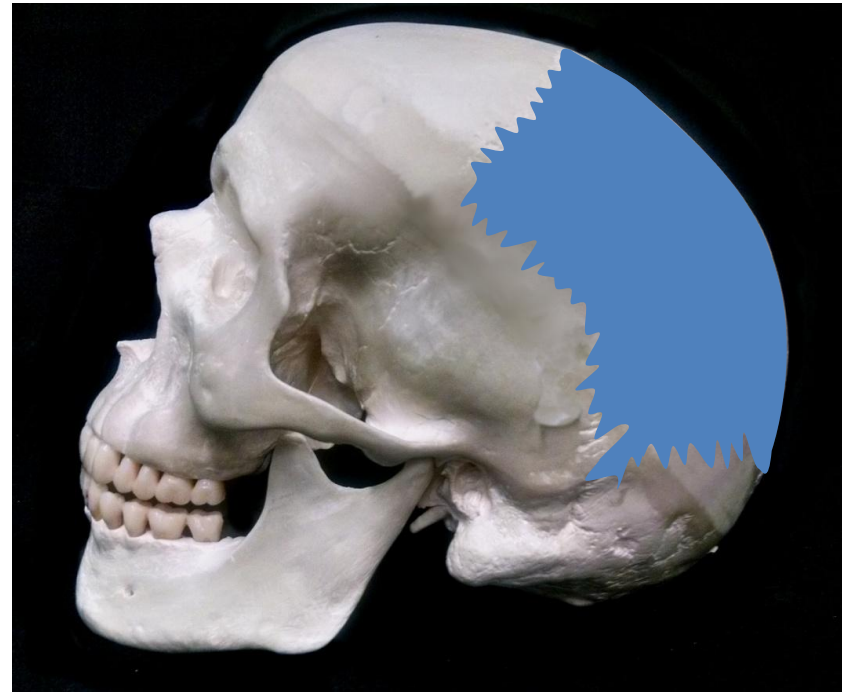


Ethmoid,
Anterior View,
Nasal bones
removed

Anterior View of the Skull: Ethmoid



Temporal bone



Parietal Bone

Sagittal view of the skull: Temporal Bone and Parietal Bone

Axial



Occipital bone



Palatine bone

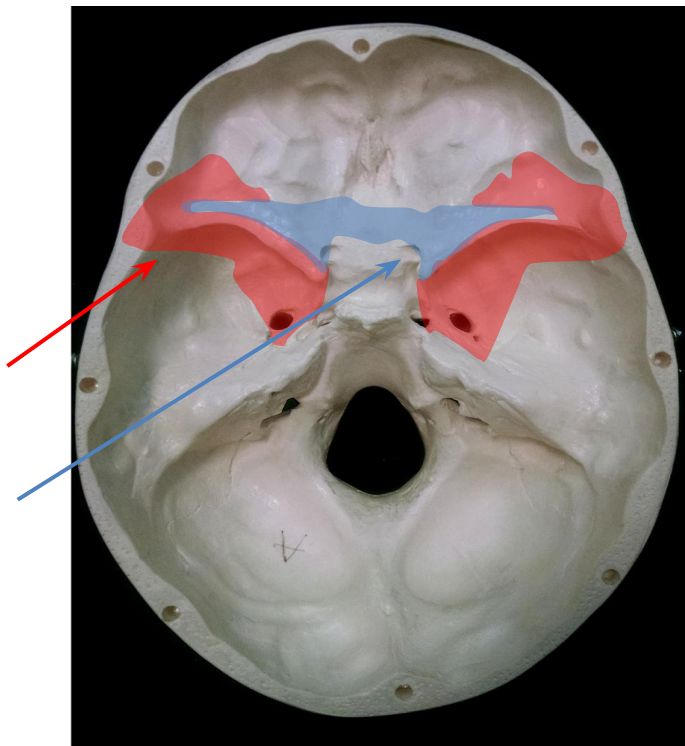
Inferior view of the skull: Occipital Bone & Palatine Bone

Axial

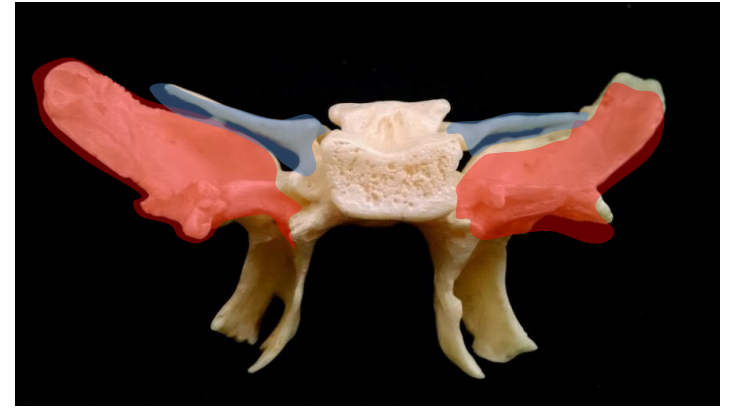
Sphenoid has wings!

Greater Wings

Lesser Wings



Sphenoid bone, Superior view,
Roofing Bones Removed

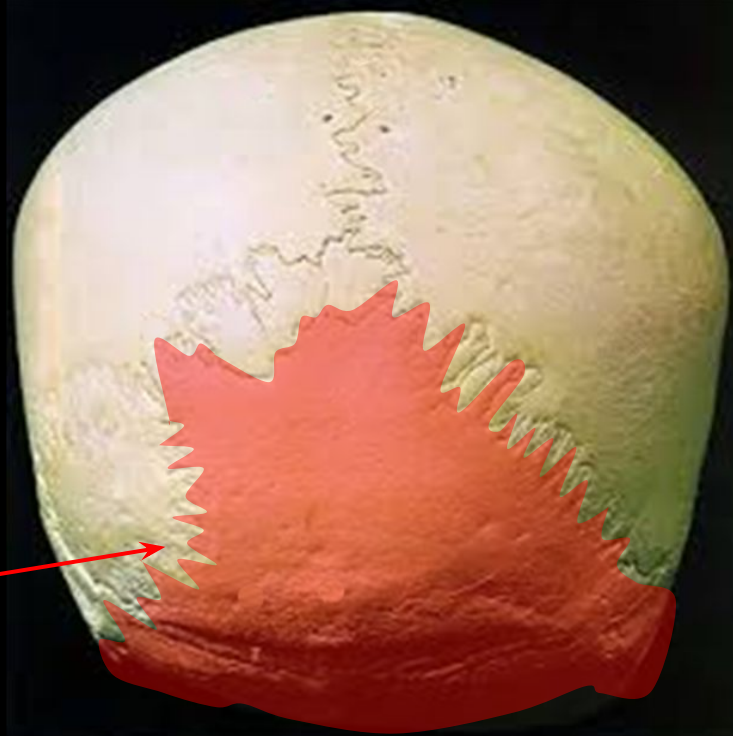


Sphenoid,
Anterior View

Sphenoid Bone

Axial

Occipital bone



Posterior View of the Skull: Occipital Bone

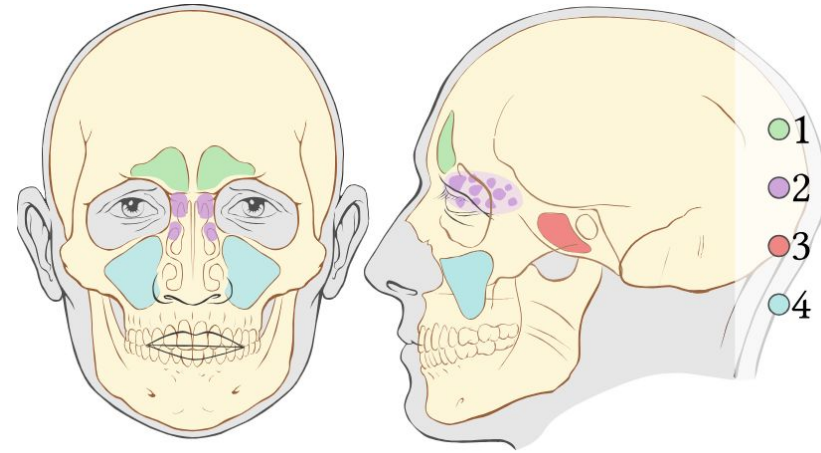


Articulated



Disarticulated

Mandible: Articulated and disarticulated



- 1 Frontal sinus
- 2 Ethmoid sinus
- 3 Sphenoid sinus
- 4 Maxillary sinus

Paranasal Sinuses

Paranasal Sinuses Radiograph Orbitofrontal Projection By Ptrump16, CC BY-SA 4.0, via [Wikimedia Commons](#)

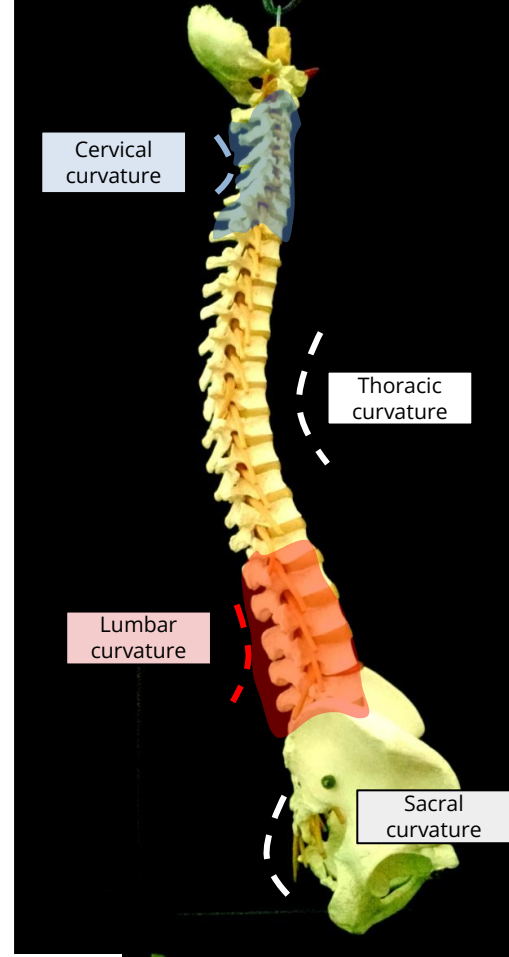
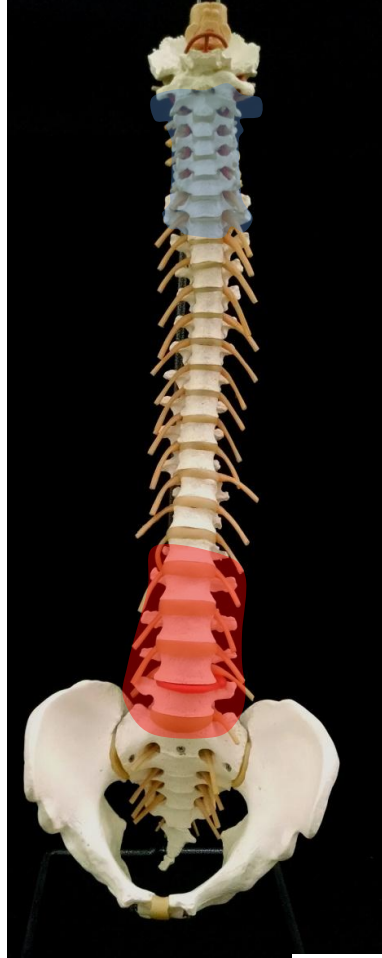
Head Anatomy by Patrick J. Lynch and Michał Komorniczak, CC BY SA 3.0, via [Wikimedia Commons](#)

Axial

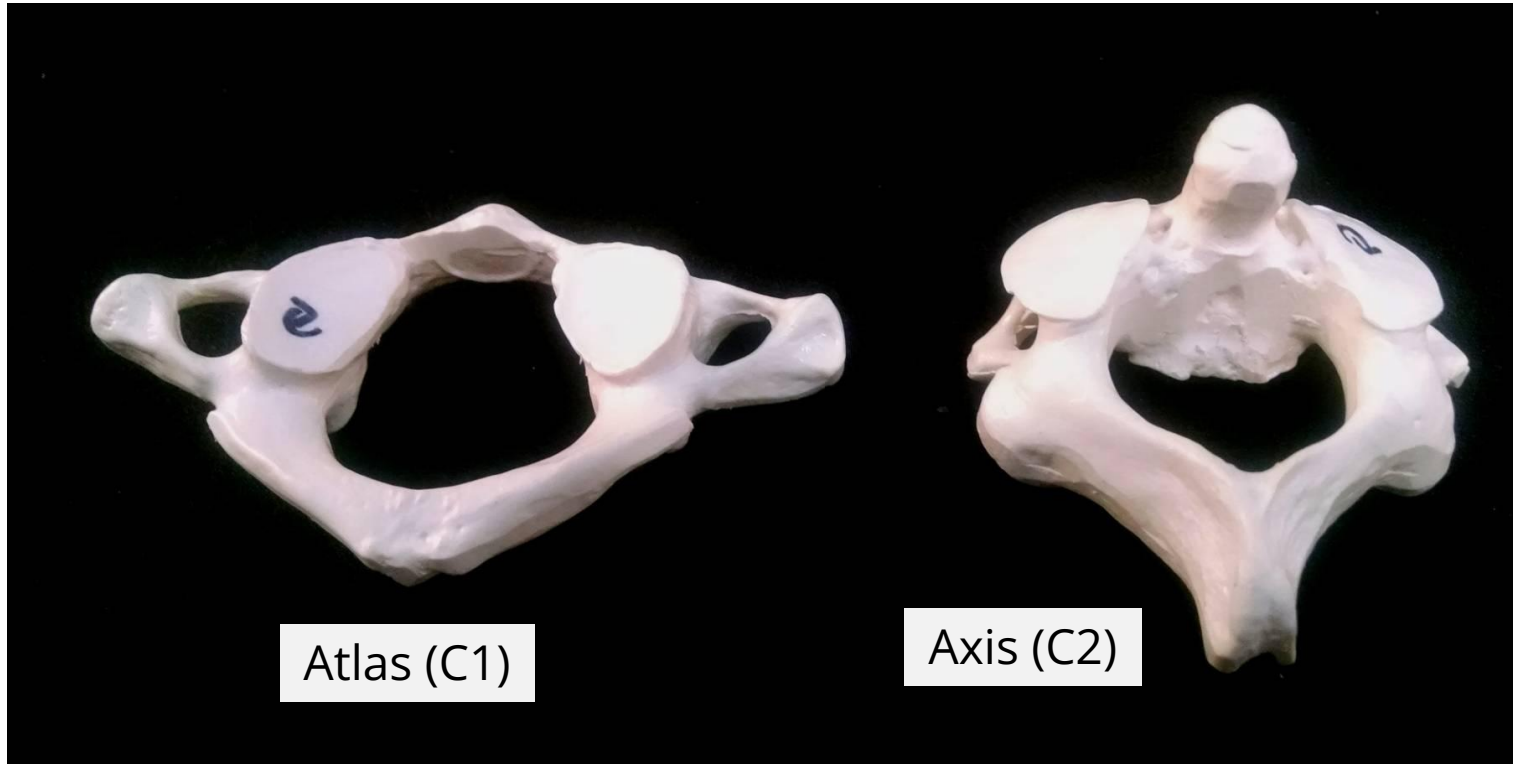
Cervical vertebrae
(7)

Thoracic vertebrae
(12)

Lumbar vertebrae
(5)



Vertebrae



Atlas and Axis



Cervical vertebrae (7)



Thoracic vertebrae (12)



Lumbar vertebrae (5)

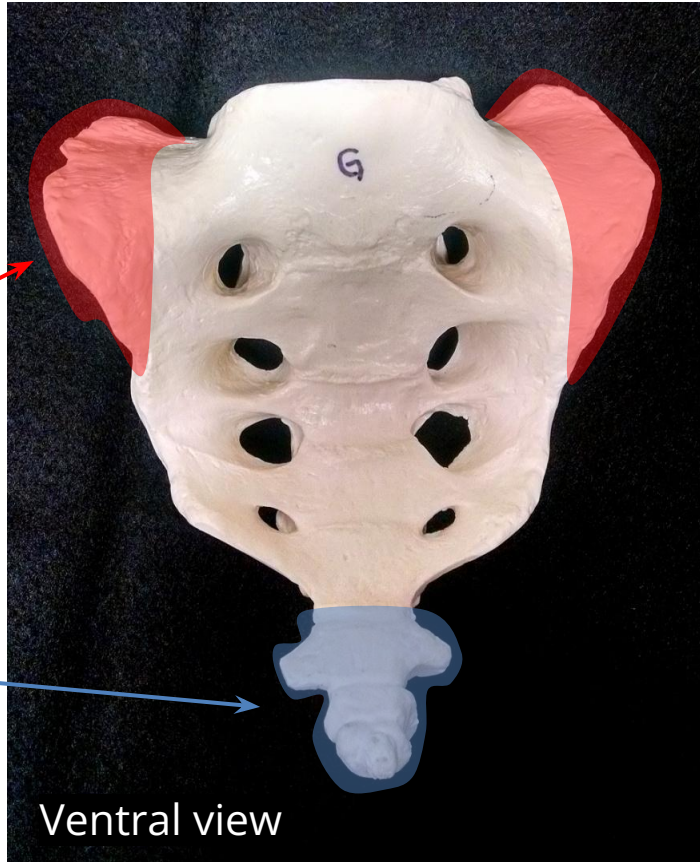


Typical Cervical C1-C7, Typical Thoracic T1-T12, Typical Lumbar L1-L5

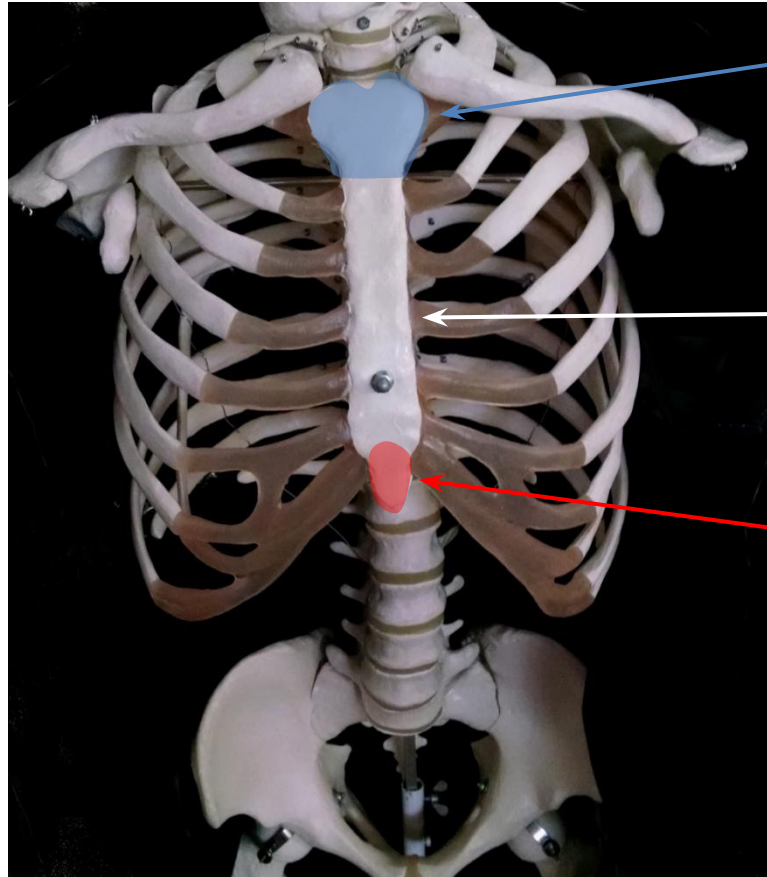
Axial

Ala of
sacrum

Coccyx



Spine: Sacrum & Coccyx



Manubrium

Body of the
sternum

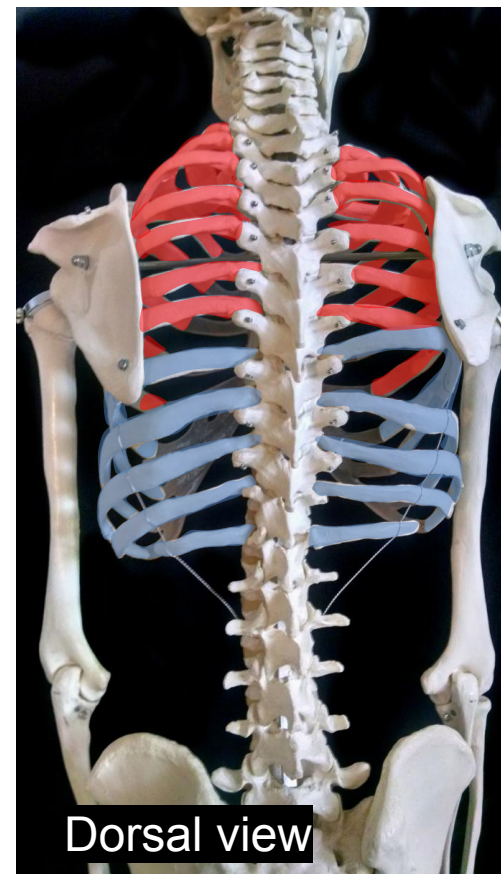
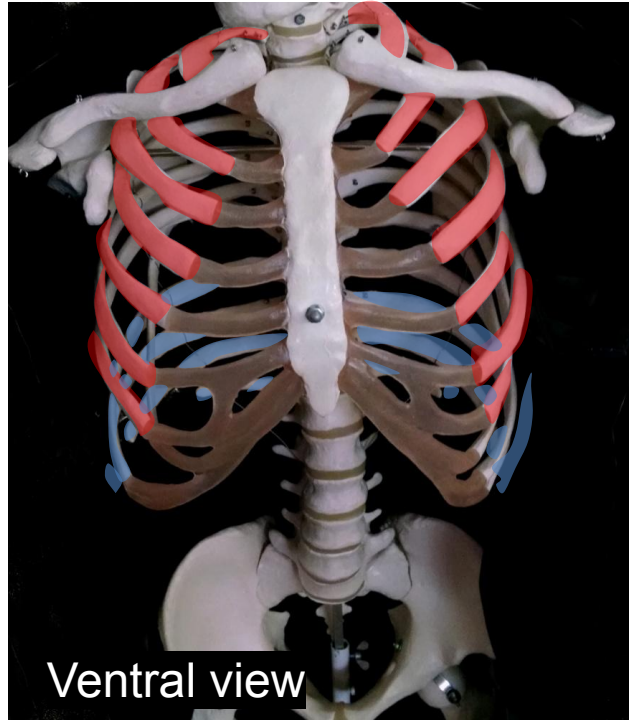
Xiphoid
process

Thoracic Cage: Sternum

Axial

Ribs 1-7
True Ribs

Ribs 8-12
False Ribs

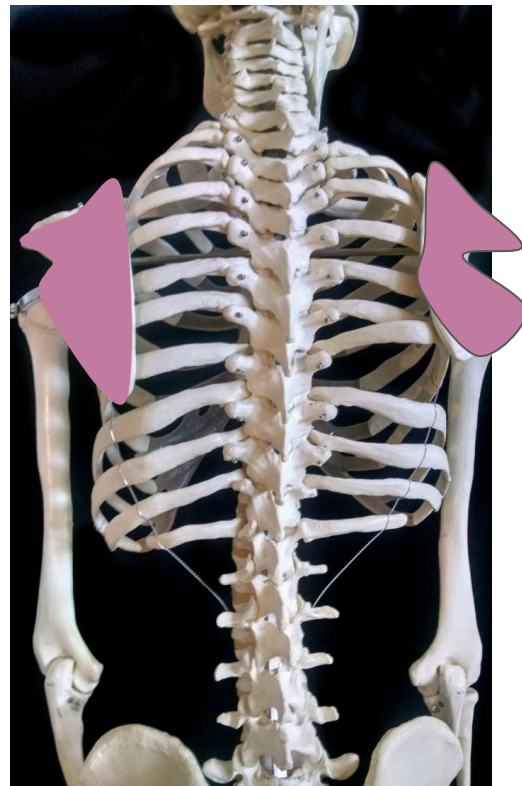


Thoracic Cage: True & False Ribs

Appendicular



Clavicle in blue



Scapula in red

Shoulder Girdle: Clavicle & Scapula

Bi231 Lab Reference by Laird Sheldahl, Ph.D., CC BY SA 4.0, via [Open Oregon](https://open.oregon.edu/)



Scapula



Dorsal view



Ventral view

Upper Arm: Humerus

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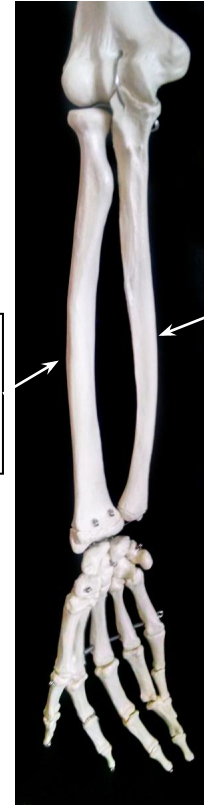


Rad!

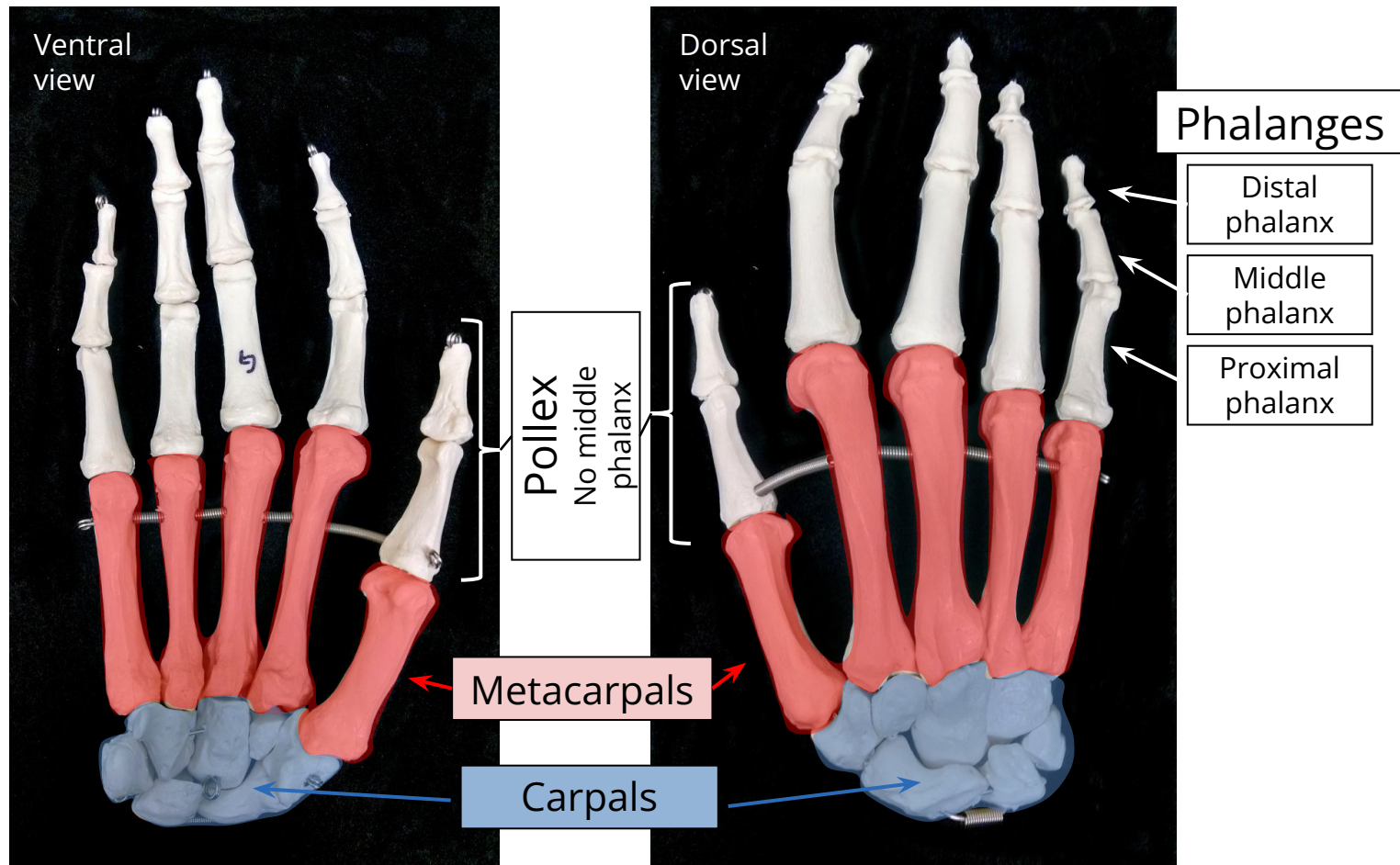
The thumb points towards
the radius

Radius
*Wider at the
distal end*

Ulna
*Wider at the
proximal end*



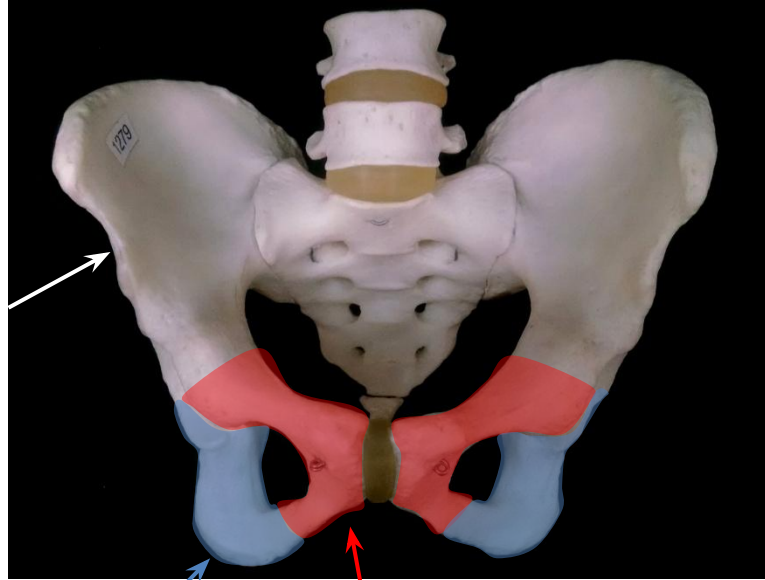
Lower Arm: Radius and Ulna



Wrist and Hand: Carpals, Metacarpals, Phalanges

Appendicular

Ventral view



Ilium

Ischium

Pubis

Lateral view



Pelvis: Ilium, Ischium, Pubic Bone



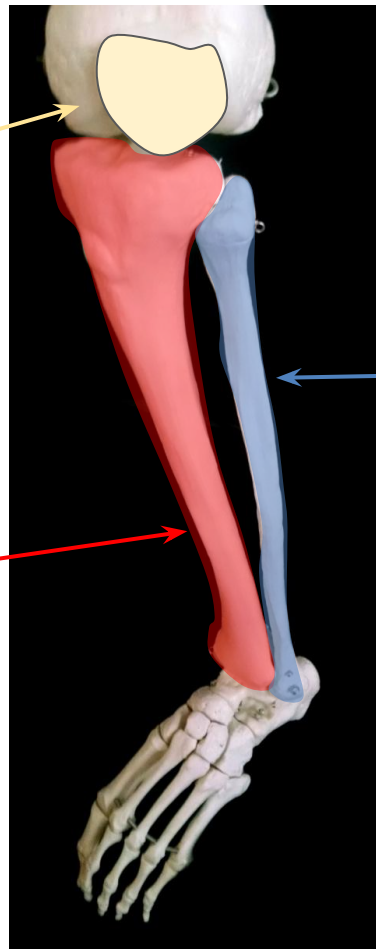
Upper Leg: Femur

Appendicular

Patella

Tibia
(medial)

Fibula
(lateral)



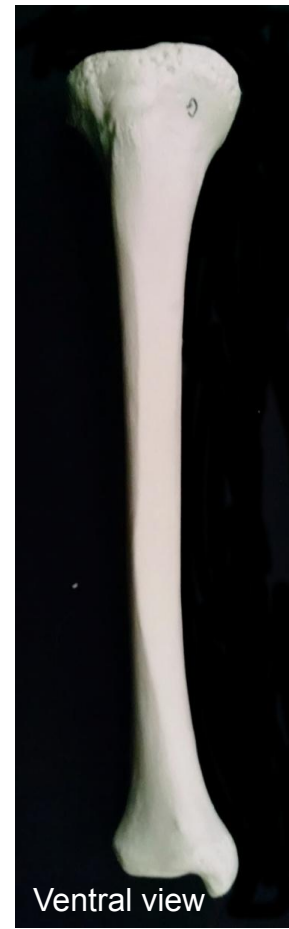
Dorsal view



Ventral view

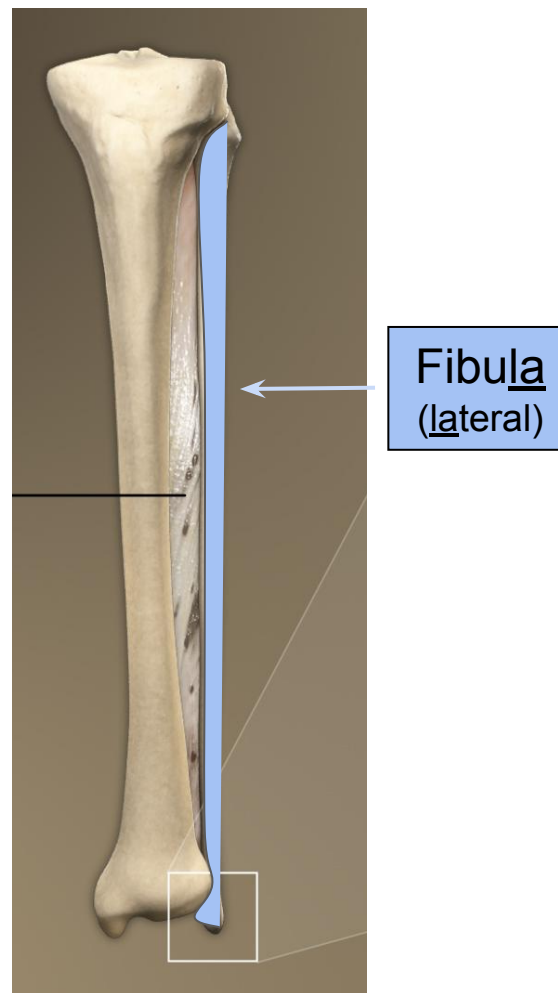


Lower Leg: Tibia, Fibula, and Patella

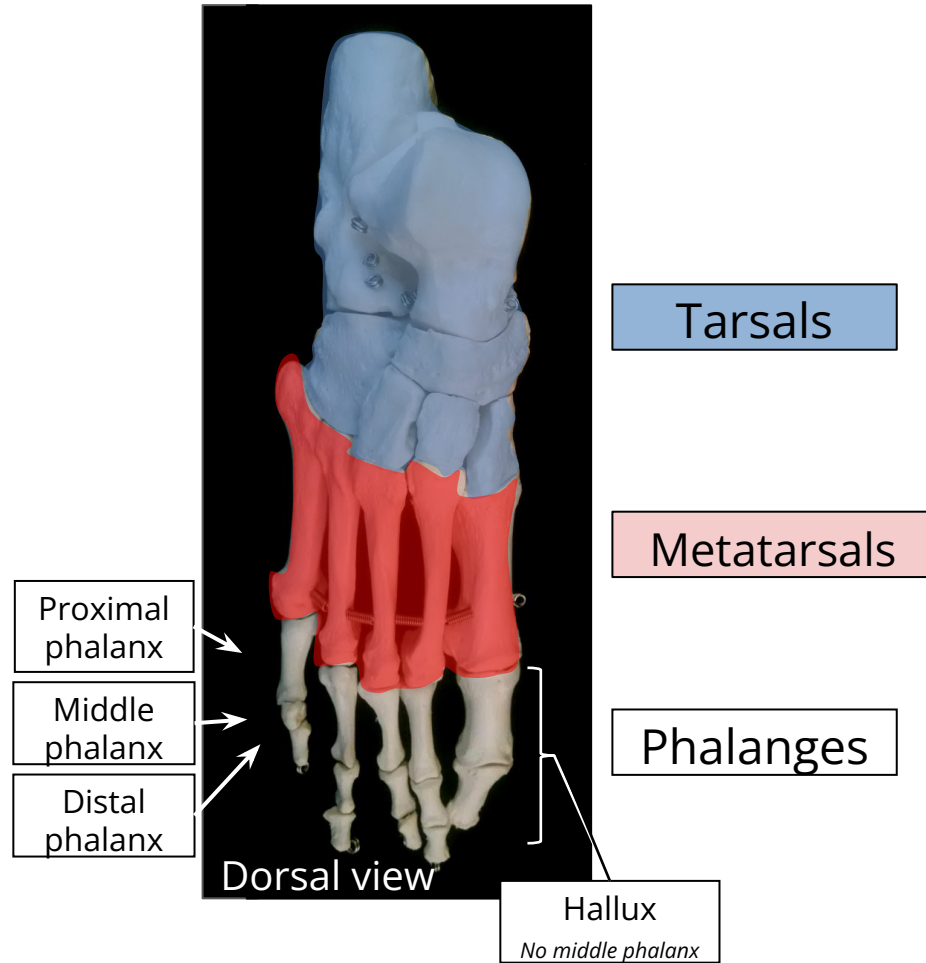


Lower Leg: Tough Tibia

Lower Leg: Flimsy Fibula



Ankle and Foot



Lesson 2: Divisions of the Skeletal System Wrap Up

Summary:

- Identified the major components of the skeletal system by division and by anatomical name.

