Name _____ Period _____ Date _____

Anatomy Study Guide
Chapter 7: "The Skeleton"

Part A - The Axial Skeleton:

Altogether, the axial skeleton consists of _____ bones, & it is divided into 3 main parts: 1) _____, 2) _____ _____, & 3) _____ _____. There are also 3 main functions of the axial skeleton. First, it forms the _____ axis of the body. It also supports the _____, _____, & the _____. Finally, it protects the _____, the spinal cord, the _____, & the lungs.

1) Skull ***(refer to your pictures at the end of this packet)***

The skull is composed of two sets of bones: 1) The _____ bones (or the _____) encloses & protects the _____. It also provides attachment sites for the _____ & _____ muscles. 2) The _____ bones provide a _____ for the face & contain _____ for the sight, _____, & _____ sense organs. Additionally, these bones provide attachment sites for the _____ _____ muscles. Most of these are _____ bones & are joined together by a type of joint called _____. The _____ is the only bone that is attached with a freely _____ joint. Many of the bones have air-filled _____ the help to reduce the _____ of the skull. There are about _____ openings that provide _____ for major _____ _____ & _____ to pass up into the skull.

Cranial Bones: There are __ cranial bones: frontal, parietal (x2), occipital, temporal (x2), sphenoid, & ethmoid.

Cranial Bones – Frontal Bone**:** The _____ bone is the most _____ portion of the cranium, & it represents the _____. It contains the frontal _____ & forms the _____ wall of the eye _____. Additionally, it supports the frontal lobes of the _____.

Cranial Bones – Parietal Bone ***(left & right):*** The _____ bones are the most _____ (top) &_____ (side) parts of the _____ cavity. Together, this pair of bones makes up the _____ of the cranial cavity.

Cranial Bones – Occipital Bone**:** The _____ bone forms the _____ wall of the cranium & serves as an attachment site for many of the _____ & _____ muscles. The occipital _____ on the base of this bone form the joint with the skull & the _____ _____. The foramen _____ is the large opening in this bone for the _____ _____ to pass through and attach to the _____.

Cranial Bones – Temporal Bone ***(left & right):*** The _____ bones are both _____ to the parietal bones on each side of the skull. Together, they form the _____ sides of the cranium & part of the _____ _____. The external _____ _____ is a feature of the temporal bones that surrounds each _____ ear canal. The _____ fossa forms the temporomandibular joint (TMJ) with the _____, & the _____ process is the part of the _____ bone that is nearest your ear.

***Cranial Bones – Major Sutures*:** There are ____ sutures that form major joints in the cranium. The _____ suture forms the joint between the _____ bone & the _____ bone. The _____ suture forms the joint between the _____ bone & the _____ bone. The _____ suture forms the joint between the _____ bone & the _____ bone. The _____ suture forms the joint between the left & the right _____ bones.

***Cranial Bones – Sphenoid Bone*:** The _____ bone is a complex, _____-shaped bone. It is considered to be the "_____" of the cranium because it forms _____ with all of the other _____ bones. The _____ turcica is a small _____ in the sphenoid bone that holds the _____ gland.

***Cranial Bones – Ethmoid Bone*:** The _____ bone is the _____ skull bone, & it forms the superior part of the _____ _____. The _____ plates are the features of the ethmoid bone that form the roof of the _____ cavity. The _____ galli is a piece of bone that sticks up between the cribiform plates & _____ to the covering of the _____ to help _____ it to the cranial cavity.

Facial Bones: There are __ facial bones: mandible, maxillary (x2), zygomatic (x2), nasal (x2), lacrimal (x2), palatine (x2), vomer, & inferior nasal conchae (x2).

***Facial Bones – Mandible*:** The _____ forms the _____ jaw & is the largest, _____ facial bone. The _____ joint (TMJ) is the only _____ _____ joint in the skull, & it provides for movement of your mouth. The _____ margin contains the _____ for your teeth.

Facial Bones – Maxillary Bone (x2): The _____ bones are actually two bones that are fused _____ into one. Together, they form the _____ jaw & the _____ portion of the face just below the nose. They are the "_____" of the face & form joints with all of the other _____ bones.

Facial Bones – Zygomatic Bone (x2): The _____ bones make up the _____ & form the _____ walls of the _____.

Facial Bones – Nasal Bone (x2): The _____ bones form the _____ of the _____.

Facial Bones – Lacrimal Bone (x2): The _____ bones form the _____ walls of the _____. They also house the _____ sac which is part of the passageway that allows _____ to _____ into the _____ cavity.

Facial Bones – Palatine Bone (x2): The _____ bones form the back _____ of the roof of the _____ often referred to as the _____ palate. They also form the _____ walls of the _____ cavity.

***Facial Bones – Vomer*:** The _____ is a _____-shaped bone that forms the lower nasal _____.

Facial Bones – Inferior Nasal Concha (x2): The _____ _____ _____ form the _____ walls of the _____ cavity. Because of their "ridged" structure, they force _____ air to _____ so that it can pick up _____ before traveling to the _____.

Other Skull Features: The Hyoid Bone is _____ considered a bone of the _____. Furthermore, it is the only bone in the body that _____ _____ _____ with another bone. It serves as an attachment site for the muscles involved in _____ & _____. It also acts as a _____ base for the _____.

The Paranasal Sinuses are found in the _____, sphenoid, ethmoid, & _____ bones. They are _____-lined, _____-filled spaces that enhance the _____ of the voice & _____ the skull.

2) Vertebral Column ***(refer to your pictures at the end of this packet)***

The vertebral column transmits the _____ of the _____ to the _____ limbs of your body. It _____ & _____ the spinal cord & provides attachment points for the _____ & _____ of the back & neck. Despite its strength, it is _____ due to its _____ construction. The vertebral column is composed of ___ bones altogether that are divided into ___ segments: 1) The _____ vertebrae include the first ___ bones & are the vertebrae of the neck. 2) The _____ vertebrae are the next ___ bones & are the vertebrae of the thoracic cage. 3) The _____ vertebrae are the next ___ bones & are the vertebrae of the lower back. 4) The next section is the _____, & 5) the final segment is the _____.

The natural curvatures of the vertebral column increase the overall _____ of the spine. They allow the spinal column to function like a _____ instead of a solid _____. When viewed from the side, the spinal column appears ___-shaped with 2 posteriorly _____ curvatures (the _____ curvature & the _____ curvature) & 2 posteriorly _____ curvatures (the _____ curvature & the _____ curvature). There are 3 possible abnormal curvatures: 1) _____ is an abnormal _____ curve when viewed from behind; 2) Kyphosis causes you to be "_____"; & 3) Lordosis causes you to be "_____".

Several ligaments work together to give added _____ & _____ to the spine. 1) The anterior & posterior _____ ligaments run the _____ _____ of the spine. The anterior ligament is on the _____ side & prevents you from bending too far _____. The posterior ligament is on the _____ side & prevents you from bending too far _____. 2) The Ligamentum _____ ligaments are much smaller and only connect 2 _____ vertebrae. 3) The _____ ligaments connect each vertebrae to the one just _____ & _____ it. The combination of these 3 types of ligaments greatly improves stability.

The intervertebral discs form cushion-like _____ between the vertebrae acting as _____ _____ while _____, jumping, & _____. They are _____ in the _____ & _____ regions which provides those areas enhanced _____. All of the discs _____ during the course of the day

so that you are always a few millimeters _____ at night. A herniated disc (or "_____ _____") is a _____ of the disc caused by _____ of the vertebrae above & below the disc. In this case, the disc "_____" out from between the vertebrae. If this squeezed disc begins pressing on the spinal cord, it causes _____ or _____. Usually, this is treated with moderate exercise, _____, heat, & _____. If this doesn't work, the disc may have to be _____ _____ & the vertebrae on either side of the disc will be _____ together.

General Structure of Vertebrae: There are 4 main parts to every vertebra. 1) The body or _____ is the anterior portion of the bone & is the main _____-bearing region. 2) The vertebral _____ is the opening for the _____ _____. 3) The intervertebral _____ form openings _____ the vertebrae for the _____ _____ to leave the spinal cord. 4) The _____ process projects out of the _____ side of the bone & is designed for _____ against blows to the back.

Types of Vertebrae: 1) The Cervical Vertebrae (____-____) are the _____ & lightest of all vertebrae. They are found in the _____. The ____ vertebra (or _____) articulates with the base of the _____ & allows you to nod "_____". The ___ vertebra (or _____) has a knoblike "_____" that projects up. The atlas _____ around the "_____" & allows you to shake your head "_____". 2) The Thoracic Vertebrae (____-____) all form joints with the _____. Additionally, they all have _____, downward-pointing _____ processes. 3) The Lumbar Vertebrae (____-____) form the "_____ of the _____" & receive the most _____. Each has a very _____ _____ designed to handle the extra _____. 4) The Sacrum shapes the _____ wall of the _____, & its _____ borders form the joints with the _____. 5) The Coccyx (or _____) is the base of the vertebral column & is nearly _____.

3) Thoracic Cage

The thoracic cage is also known as the "_____ _____". It is made up of three main parts: 1) _____, 2) the _____ & _____ cartilage, & 3) the _____ vertebrae. The bony thorax forms a _____ that is used to protect the major _____ of the _____. It also supports the _____ girdle & the _____ limbs. Additionally, it provides multiple _____ attachment sites.

Sternum: The sternum is more commonly known as the "_____," & it is composed of 3 fused bones: 1) The _____ articulates with the _____ & ribs ____-____. 2) The _____ articulates with ribs ____-____. 3) The _____ process is a site of _____ attachment & is basically a piece of cartilage until the age of _____.

Ribs: There are ___ pairs of ribs. The _____ ribs are the top ___ ribs, & they attach _____ to the _____ via sections of _____ cartilage. The _____ ribs are ribs ___-___, & they attach _____ to the sternum. The _____ ribs are ribs ___-___, & they have ____ _____ to the sternum.

Appendicular Skeleton

The appendicular skeleton includes everything that is attached to the _____ skeleton. The three major parts are the _____ (arms/legs), the _____ girdle, and the _____ girdle. The appendicular skeleton enables us to carry out all _____ _____.

Appendicular Skeleton – Pectoral Girdle: The pectoral (_____) girdle is composed of only two bones: the _____ & the _____. This girdle attaches the _____ to the _____ skeleton & it provides the _____ with exceptionally _____ _____.

The _____ is also known as the "_____," & it acts as a _____ that holds the _____ & the _____ out _____. The clavicle transmits _____ forces of the upper limb to the _____ skeleton. IF the bone breaks, it usually fractures _____. Posterior fractures can be very _____ because there are major _____ _____ that sit just behind the clavicle.

The _____ is also known as the "_____ _____" & attaches to the _____ by way of _____. This gives the scapula (& arm) exceptional _____. The _____ cavity of the scapula articulates with the _____ of the arm, forming the _____ joint. The _____ process articulates with the _____.

Appendicular Skeleton – Upper Limb: There are ____ bones in each upper limb, & the upper limb has 3 main components: 1) The arm bone is the _____; 2) The forearm bones are the _____ & _____; & 3) The hand has ___ _____ (wrist) bones, ___ _____ (palm) bones, & ___ _____ (finger bones).

The _____ is the only _____ of the ____, & it is the _____ bone of the upper limb. Its _____ end articulates with the _____ cavity of the scapula. The greater & lesser _____ of the humerus serve as attachment sites for the _____ _____ muscles. The _____ is at the medial, distal end of the humerus & articulates with the _____. The _____ is at the lateral, distal end & articulates with the _____.

The _____ is the _____ bone in the forearm. Its main function is to form the _____ _____ with the _____. The _____ is the _____ bone in the forearm. Its main function is to form the _____ _____ with the _____ bones. There is an _____ membrane that is a flat, flexible _____ running the entire length _____ both bones holding them together.

The _____ form the "_____". There are 8 total bones laid out in ___ _____. The _____ row includes (from lateral to medial) the _____, _____, triquetrum, & pisiform bones. The _____

row includes (from lateral to medial) the trapezium, trapezoid, _____, & _____. Of the 8, only the _____ & _____ actually articulate with the _____ to form the wrist joint. The _____ form the "_____" & include a total of 5 bones. They are numbered ___-___ starting with the _____. The _____ are the finger bones. Finger #1 (_____) has only ___ phalanges (a distal & proximal) while fingers #2-5 have ___ phalanges each (_____, _____, & _____).

Appendicular Skeleton – Pelvis: The _____ girdle attaches the _____ limbs to the _____ skeleton using some of the _____ ligaments found in the body. The girdle lacks the _____ of the pectoral girdle, but it is far more _____. It supports the total weight of the _____ _____ & protects the following features of the pelvis: _____ organs, _____ bladder, & parts of the _____ intestine. The pelvic girdle is formed by a pair of _____ bones, & each _____ bone is made of 3 fused bones: the _____, the _____, & the _____. The "_____ pelvis" is comprised of the 2 hip bones plus the _____ & the _____. The _____ is the deep socket that receives the head of the _____.

Gender differences in pelvis:

Characteristic	Female	Male
General Structure & Functional Modifications	- _____ forward - adapted for _____ - true pelvis is _____, _____, & has greater _____	- _____ less forward - adapted for heavier _____ & stronger _____ - true pelvis = narrow & _____
Bone thickness	- bones are _____, _____, & _____	- bones are _____ & _____
Pubic arch	- broader (____°-_____°) ; more rounded	- angle is more acute (___°-___°)
Sacrum	- _____ ; shorter	- _____ ; longer
Coccyx	- more _____ ; _____	- less _____ ; curved _____
Pelvic inlet	- _____	- _____
Pelvic outlet	- _____	- _____

Appendicular Skeleton – Lower Limb: The bones of the lower limb are _____ & _____ than the upper limb bones. This is because the lower limbs carry the _____ of the body & are subjected to _____ _____. There are 3 main components to the lower limb: 1) The thigh bone is the _____; 2) The leg bones are the _____ & _____; and 3) The foot includes ____ _____ (ankle) bones, ____ _____ (foot) bones, & ____ _____ (toe bones).

The _____ is the bone that forms the "_____," & it is the largest & _____ bone in the body. The "_____" of the femur is the _____ part of the bone & is often fractured causing what we call a "_____ _____". The _____ (or "_____") isn't actually part of the thigh. However, its purpose is to protect the _____.

The _____ is the _____ leg bone. It receives the _____ from the _____ & transmits it to the _____. The _____ is not a _____-_____ bone. Instead, it is a _____ attachment site. It does not contribute to the _____ joint; it only _____ the ankle. These 2 bones are bound together by an _____ membrane.

The _____ form the "_____" & the posterior ____ of the foot. There are 7 total bones including the _____, calcaneus, _____, navicular, _____ cuneiform, intermediate cuneiform, & _____ cuneiform. The _____ transfers the weight from the tibia to the _____ (heel). The _____ form the anterior ___ of the foot. It is composed of 5 total bones numbered ___-___ starting with the _____ _____. There are 14 phalanges. Toe #1 (_____ _____) has ___ phalanges (distal & proximal) & Toes #2-5 have ___ phalanges (_____, _____, & _____).

Arches of the Foot: The _____ _____ are maintained by interlocking _____ bones, _____, & _____. They allow the foot to _____ _____ because they "_____" or _____ when weight is applied, & they _____ _____ when the weight is removed.

Developmental Aspects of the Skeleton

The _____ skull is very _____ compared to the infant's total body ____. It has more _____ than the _____ skull due to its unfused _____. In addition, its mandible is proportionally ____ _____. A unique feature called _____ are fibrous membranes_____ the cranial bones in infants. This feature provides the _____ with room to _____ and usually converts to solid bone within __ months after birth.

At birth, the _____ is _____ relative to the _____. By ___ months old, the cranium is ___ of the adult size. The _____ & _____ will continue to lengthen with age, & the _____ & _____ grow at a faster rate than the _____ & _____.

In terms of spinal curvatures, the _____ & _____ curvatures are obvious & well-developed at birth. This gives the spine a ____ shape. The _____ & _____ curvatures will begin to appear as the child _____ (lifts _____, learns to _____, etc.). This positions the body weight directly over the developing child's _____ ____ _____.

As you _____, the intervertebral discs become _____ & less _____, & the risk of disc herniation _____. The loss of _____ (by several ____) is common by age _____. The _____ cartilages begin to ossify & the thorax becomes _____ (_____ becomes more difficult). Finally, all of the bones _____ _____.

Homeostatic Imbalances

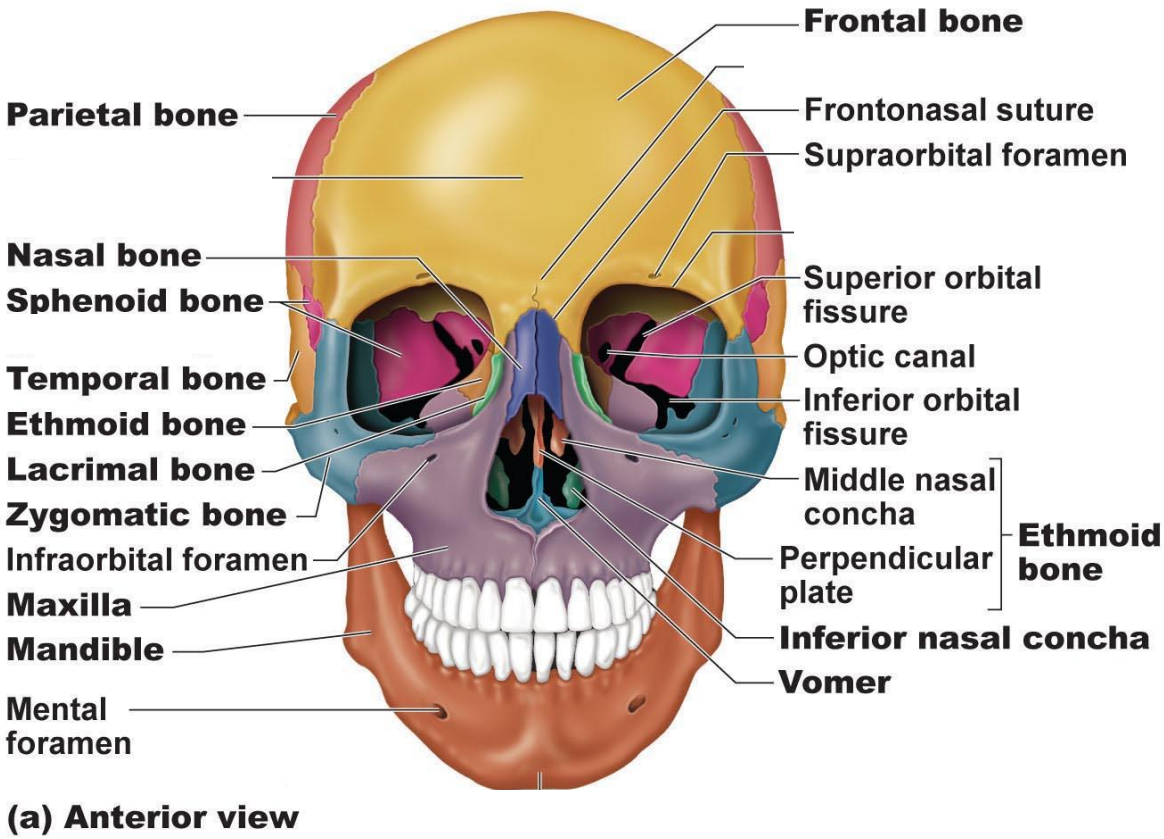
1) _____ _____ is when the right & left halves of the hard palate (maxilla) _____ to _____ leaving an opening between the _____ & _____ cavities. This makes it very difficult for babies to _____ from _____ & can lead to _____ (inhalation) of _____ into the _____.

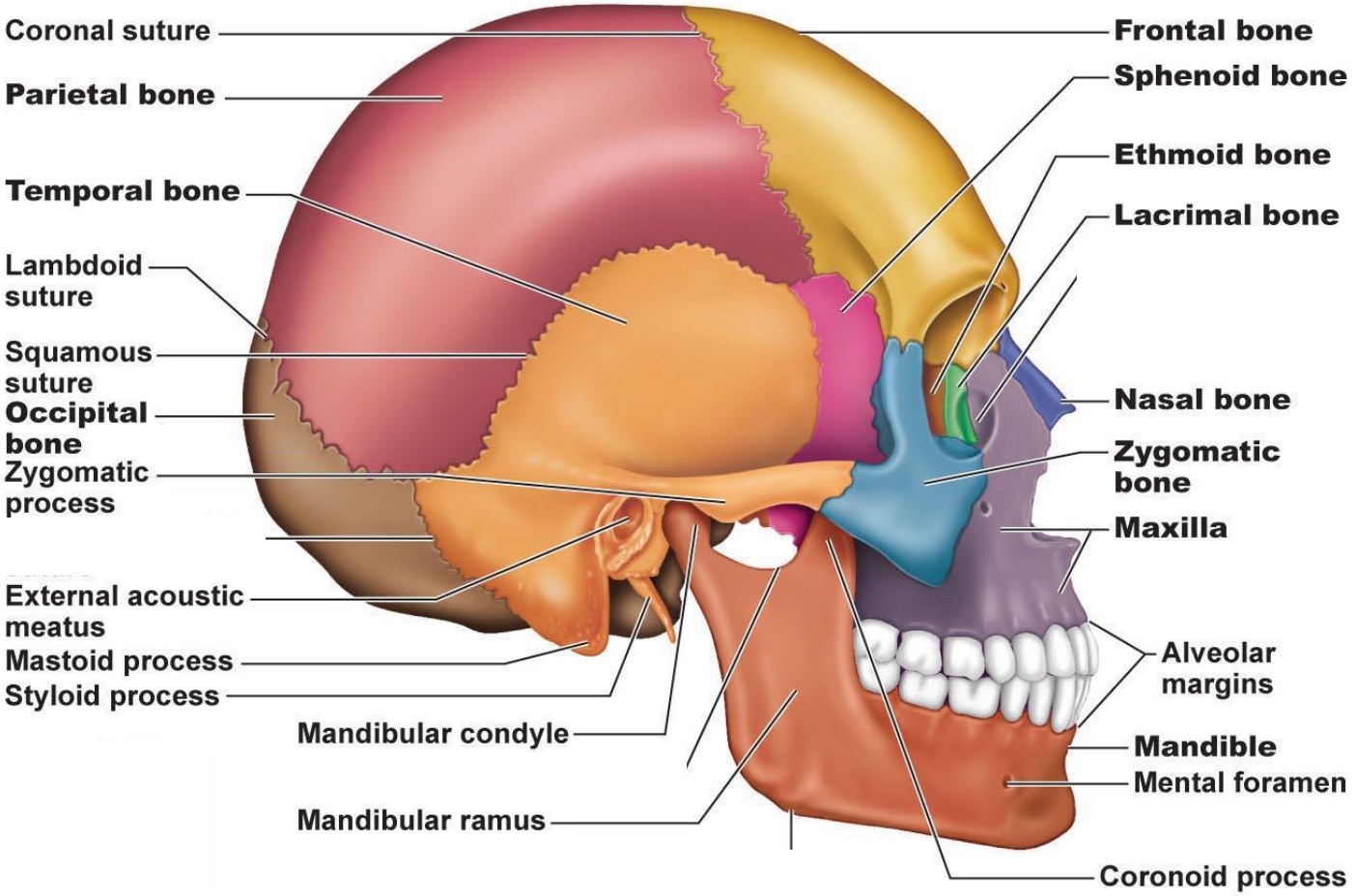
2) _____ is a congenital defect where the soles of the _____ face _____ & the toes point _____. This condition affects 1 in _____ babies. It may be a _____ defect or simply the result of an abnormal _____ of the _____ in the _____ during development.

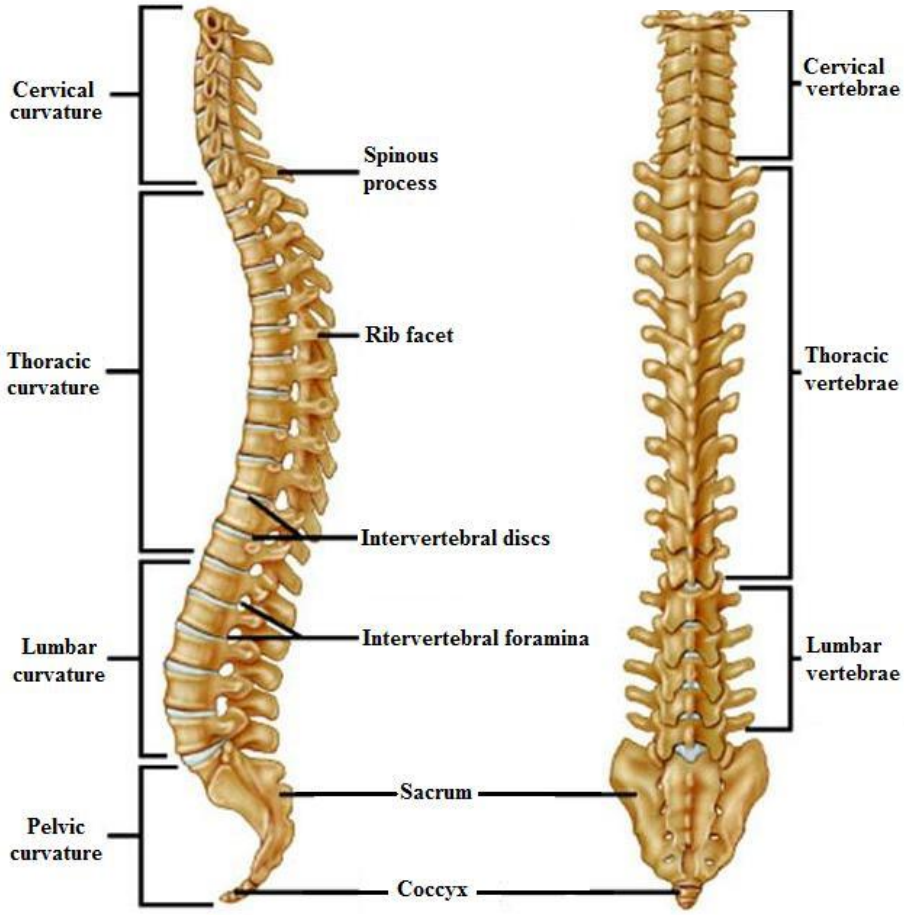
3) _____ _____ is a congenital defect of the _____ _____ where 1 or more of the vertebral arches are _____. It ranges in _____ from not causing any problems to severely impairing _____ _____ depending on the location of the defect.

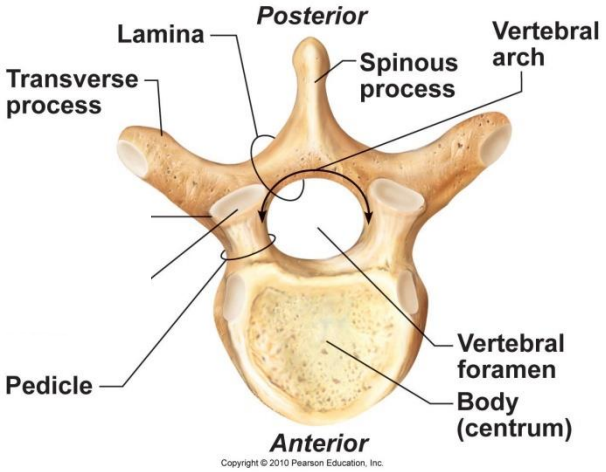
4) _____ _____ is a surgical procedure involving the _____ of _____ _____ to immobilize & _____ a specific region of the vertebral column. It is used often with _____ involving the vertebrae & with injuries involving _____ _____.

Bones to know for quizzes:




Coronal suture
Parietal bone
Temporal bone
Lambdoid suture
Squamous suture
Occipital bone
Zygomatic process
External acoustic meatus
Mastoid process
Styloid process
Mandibular condyle
Mandibular ramus
Frontal bone
Sphenoid bone
Ethmoid bone
Lacrimal bone
Nasal bone
Zygomatic bone
Maxilla
Alveolar margins
Mandible
Mental foramen
Coronoid process


Cervical curvature
Thoracic curvature
Lumbar curvature
Pelvic curvature
Spinous process
Rib facet
Intervertebral discs
Intervertebral foramina
Sacrum
Coccyx
Cervical vertebrae
Thoracic vertebrae
Lumbar vertebrae


Posterior
Lamina
Transverse process
Spinous process
Vertebral arch
Pedicle
Vertebral foramen
Body (centrum)
Anterior
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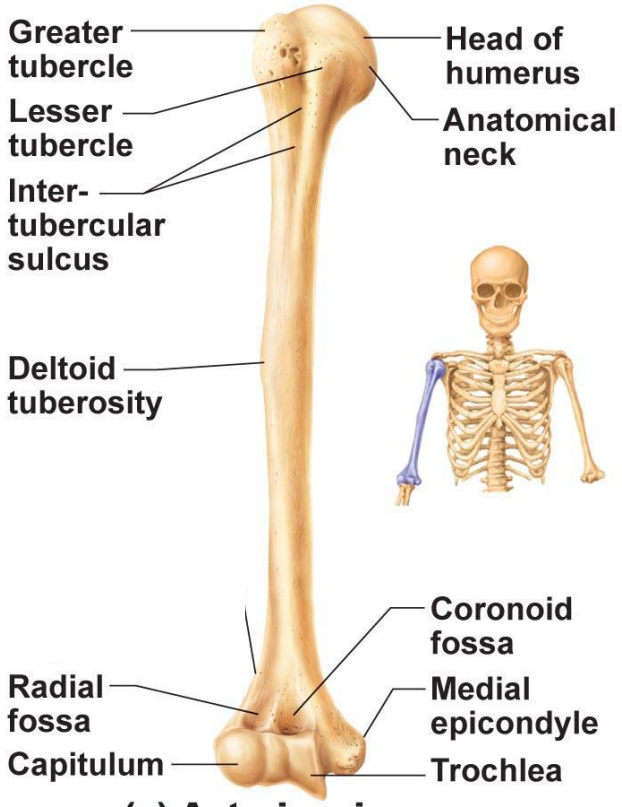
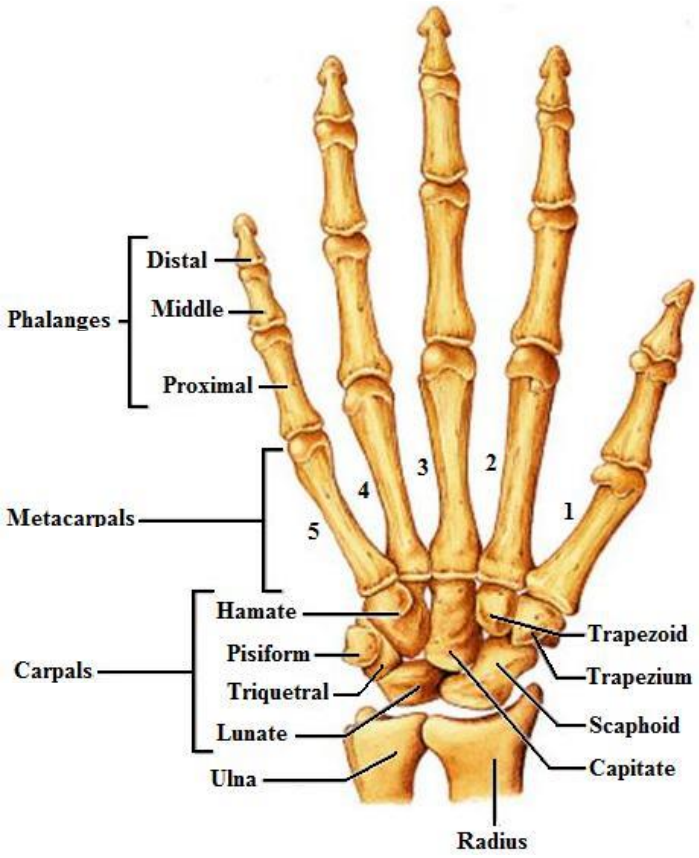
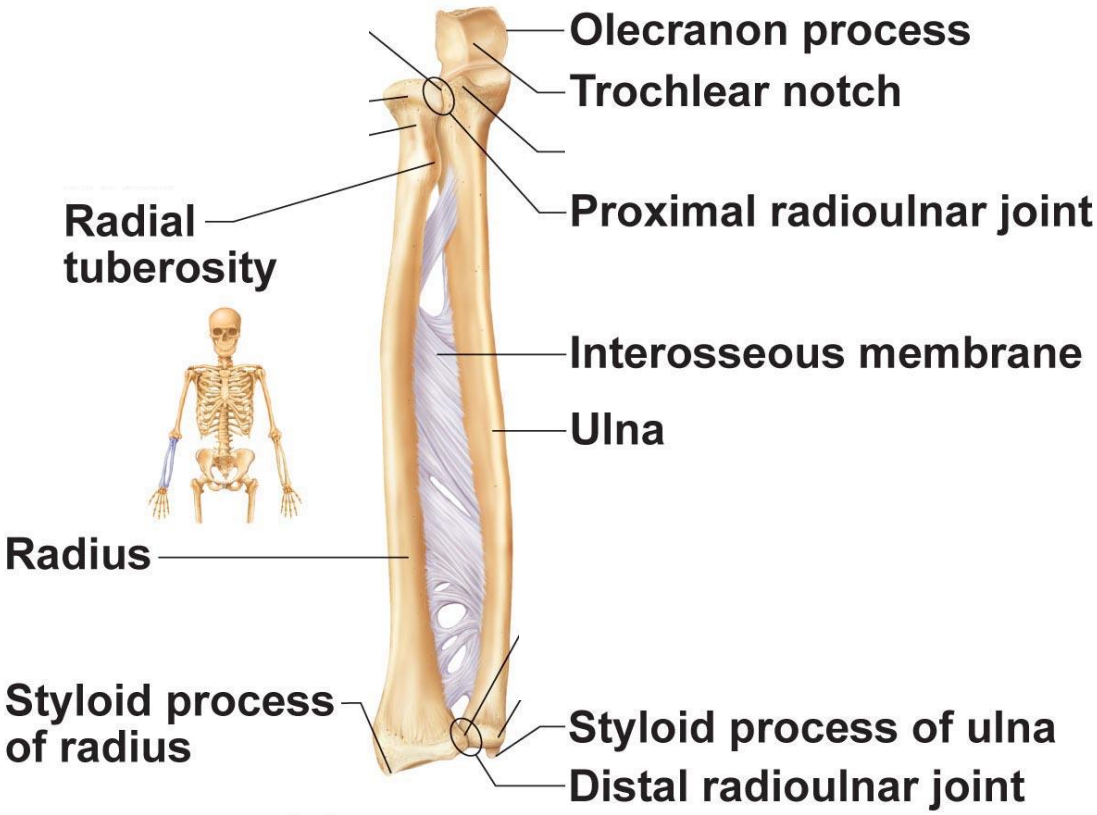
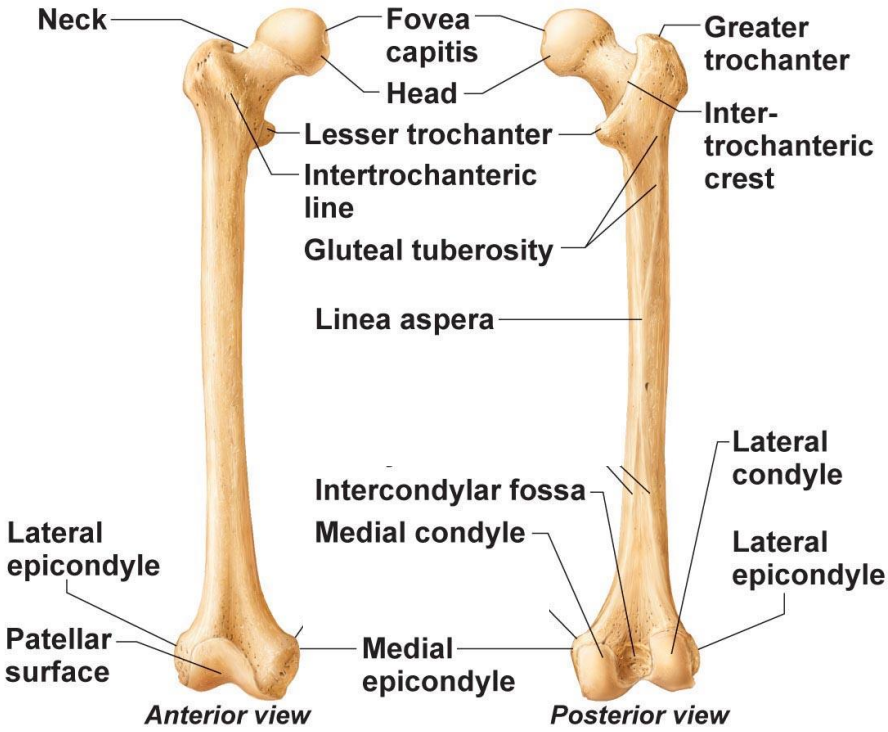


(a) Anterior view

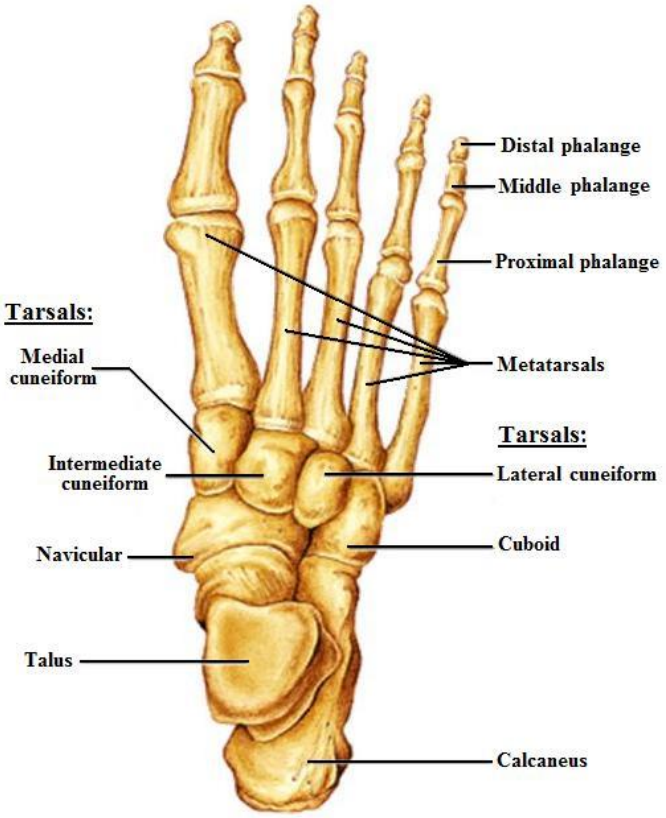


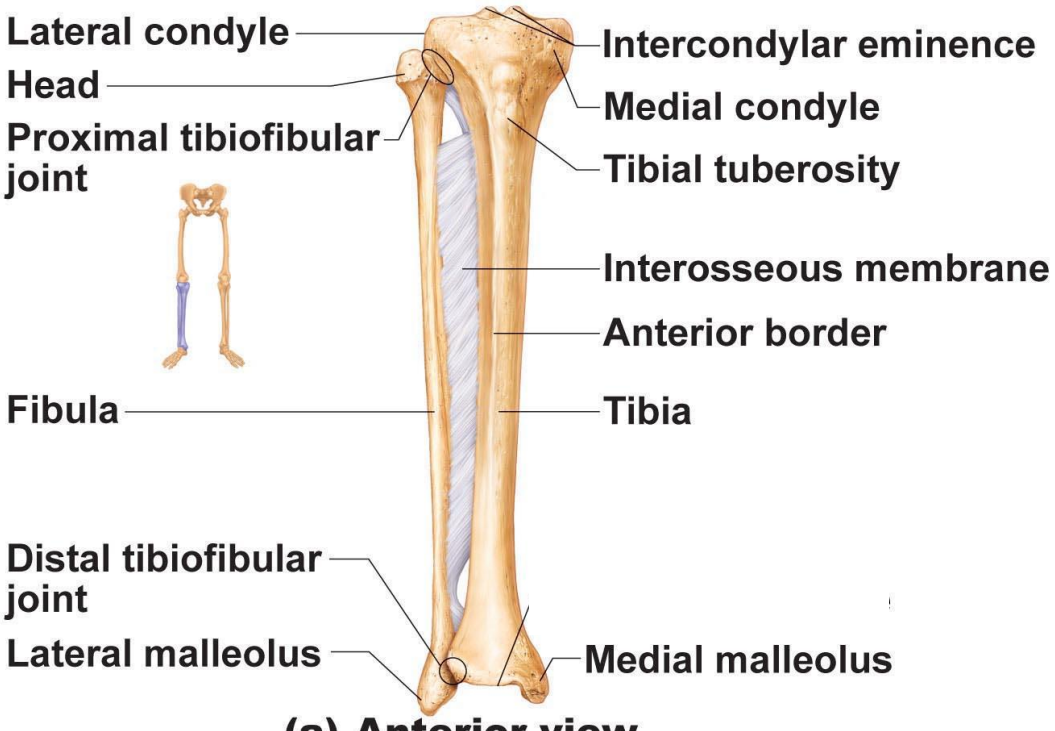


(a) Anterior view

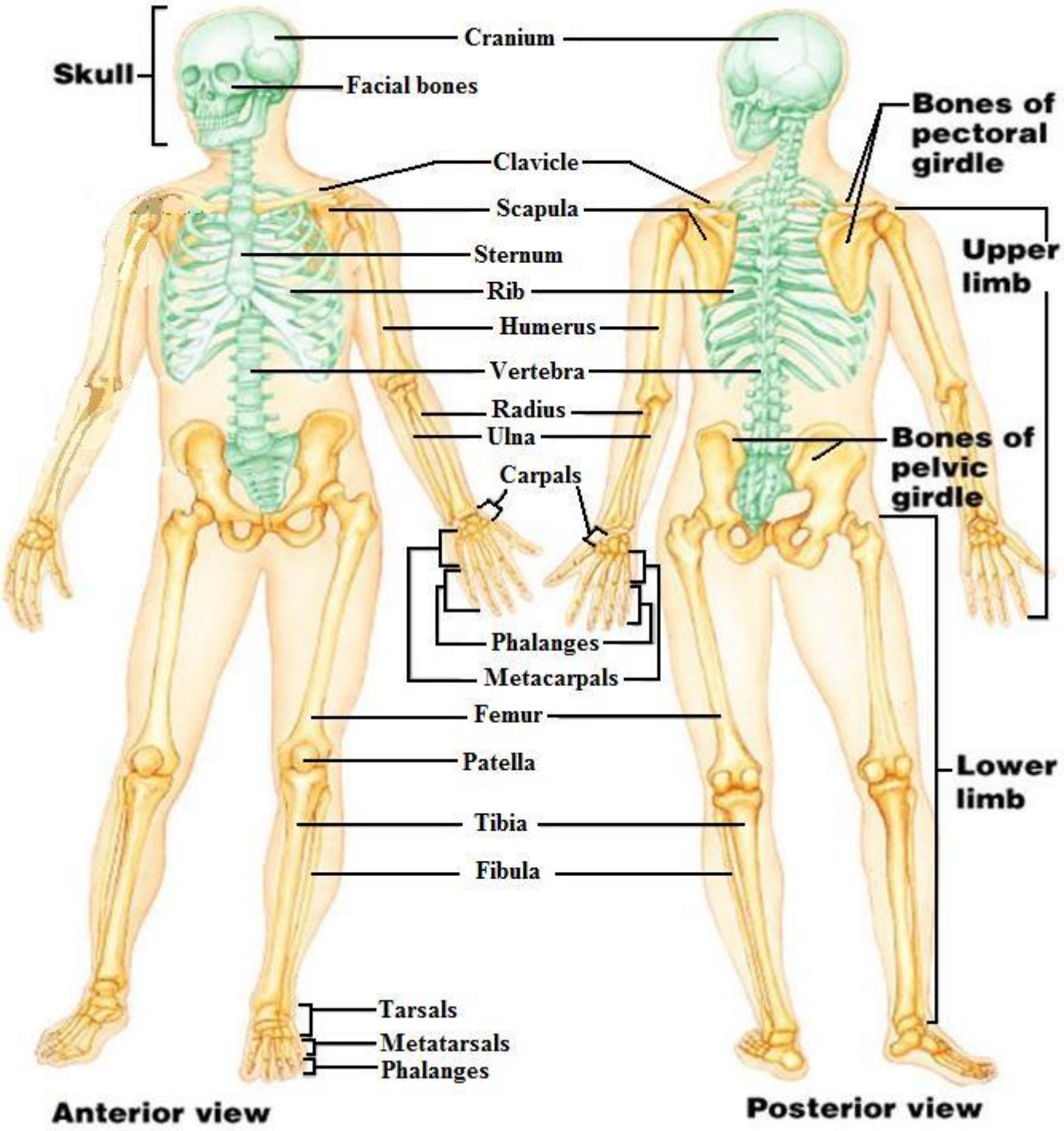


(b) Femur (thigh bone)





(a) Anterior view


Skull
Cranium
Facial bones
Clavicle
Scapula
Sternum
Rib
Humerus
Vertebra
Radius
Ulna
Carpals
Phalanges
Metacarpals
Femur
Patella
Tibia
Fibula
Tarsals
Metatarsals
Phalanges
Anterior view
Bones of pectoral girdle
Upper limb
Bones of pelvic girdle
Lower limb
Posterior view