

Bones of The Lower Limbs

Anatomy Team 434

Color Index:

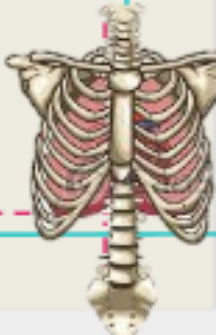
- **Important Points**
- Helping notes
- **Explanation**

If you have any complaint or suggestion please don't hesitate to contact us on:

AnatomyTeam434@gmail.com

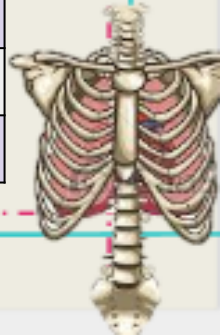
OBJECTIVES

- At the end of the lecture the students should be able to:
- Classify the bones of the three regions of the lower limb (thigh, leg and foot).
- Memorize the main features of the
 - Bones of the thigh (femur & patella)
 - Bones of the leg (tibia & Fibula).
 - Bones of the foot (tarsals, metatarsals and phalanges)
- Recognize the sides of the bone



New Terms

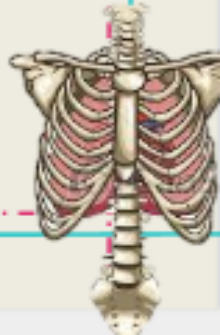
General	Term	Meaning
Processes that helps to form joints	Condyle	Large, rounded articular
	Facet	Smooth, flat surface
	Head	Enlarged portion at an end of a bone
	Ramus	Branch or extension of a bone
Processes that provide for the attachment of muscles and ligaments	Crest	Narrow ridge
	Epicondyle Linea (line)	Process on or above a condyle Narrow ridge (less prominent than a crest)
	Spine	Sharp or pointed process (spinous process)
	Trochanter	Large, irregularly shaped process (found only on the femur) (for attachment of other structures (ligaments))
	Tubercle	Small, knoblike process (trabecular : site of muscle attachment)
	Tuberosity	Large, knoblike process



REMEMBER: lower and upper ends of bones are important for articulations.

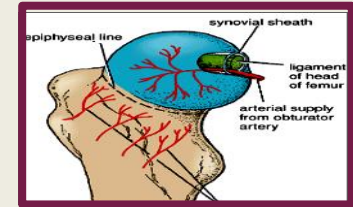
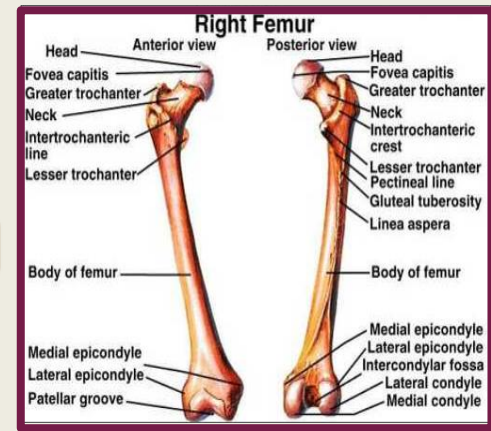
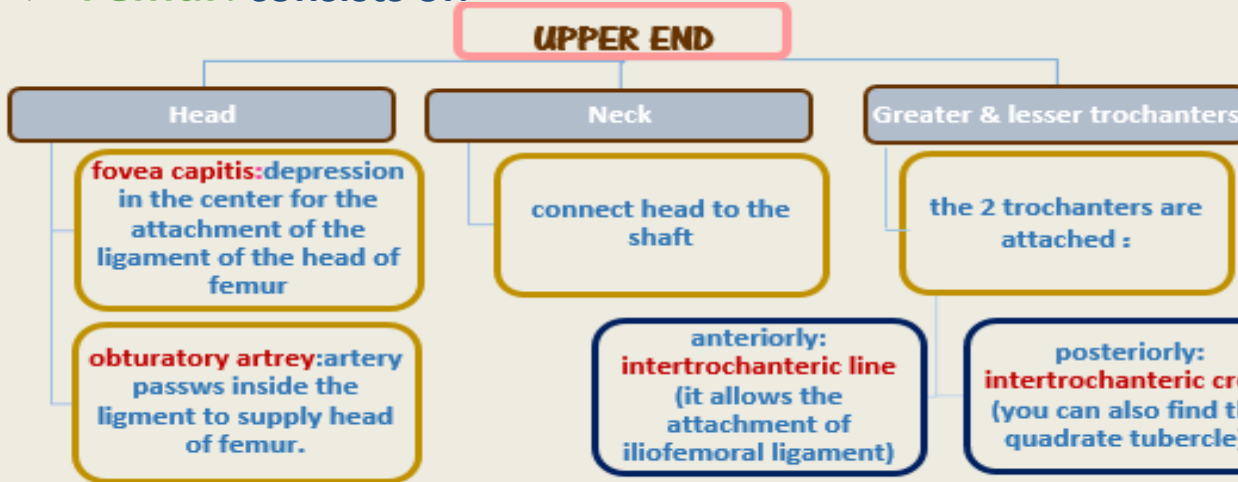
New Terms

General	Term	Meaning
Depressions or openings (may provide passageways for blood vessels and nerves)	Notch	An indentation, (incision) on an edge or surface
	Fissure	Narrow opening
	Fontanel	Membrane-covered spaces between skull bones
	Interosseous border	Between bones (the place where the two parallel bones attach together by the interosseous membrane)
	Foramen	Round opening
	Fossa	Shallow depression
	Fovea	Pit-like depression
	Meatus	Tube-like passage
	Sinus	Interior cavity
	Sulcus "groove"	Long, narrow depression



BONES OF THIGH

❖ **Femur:** consists of:



LOWER END

lateral and medial condyles:

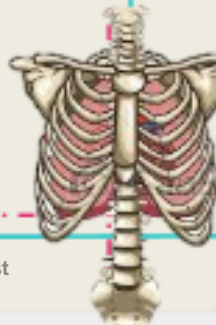
the medial is bigger, it articulates with the tibia

separated:

posteriorly: by **intercondylar notch or fossa.**

anteriorly: by **articular patellar surface.**

above the condyles are the medial and lateral **epicondyles.** (مثل النتوء)



-the intertrochanteric line joins the two trochanters it is an attachment site for muscles, ligaments (Ilio-femoral ligament) this ligament is of the hip joint.
-if the femur head is broken you have to replace it.

-the quadrate tubercle is on the posterior part of the intertrochanteric crest
-POSTERIORLY the intertrochanteric CREST connects the trochanters.

Femur

shaft:

three borders

linea aspera: is a prominent, thick posterior rigid border.

-At the middle third it will divide to medial and lateral lips.

-linea aspera is very important because it has many muscles attached to it.

Medial(rounded)

Lateral(rounded)

The lateral margin (lip): will continue below with the lateral supracondylar ridge.

The medial margin (lip): will continue below with the medial supracondylar ridge.

You
[A Helpful website for Bone marking](#)

three surfaces

Anterior
(smooth, convex and rounded)

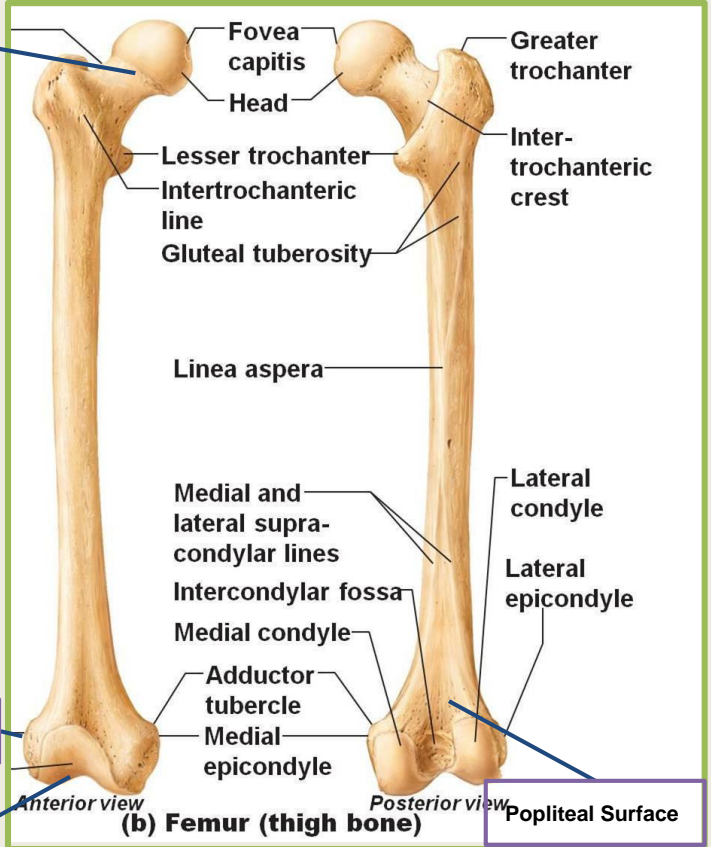
Medial

Lateral

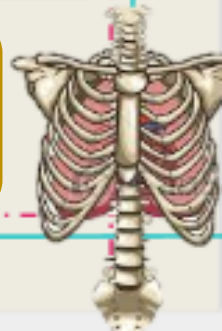
Popliteal surface:
 A triangular area lies at the lower end of shaft.

Lateral Epicondyle

Patellar Surface



Gluteal tuberosity: Posteriorly Below the greater trochanter (for attachment of gluteus maximus muscle).
 (between greater trochanter and linea aspera)



-the anterior and medial surfaces are both medial
 -the posterior and lateral surfaces are both lateral

-*border = ridge = sharp line

❖ Femur:

❖ Patella

Articulation of femur

superiorly

with acetabulum of hip bone to form the hip joint. **(BY THE HEAD OF THE UPPER END)**

inferiorly

with tibia and patella to form the knee joint. **(BY THE lateral and medial condyles)**

POSITION OF FEMUR

(RIGHT OR LEFT)

Head: is directed upward & Medially.

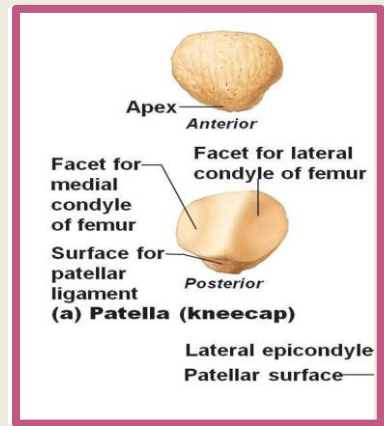
the head is always pointing medially and the anterior surface is smooth

Shaft:

anteriorly: is smooth and convex

posteriorly: is rough and concave

[Femur visual video](#)



largest sesamoid bone(1)(lying inside the Quadriceps tendon in front of knee joint)

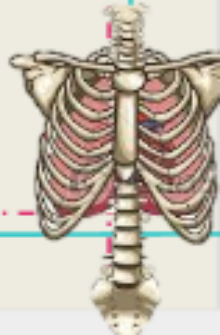
Inferiorly: its apex is connected to tuberosity of tibia by **ligamentum patellae**

Anterior surface: rough and subcutaneous.

posterior surface: articulates with the condyles of the femur to form **knee joint.(has a fossa)**

Its upper, lateral, and medial margins: give attachment to **Quadriceps femoris muscles.**

it is a bone to support the knee joint.

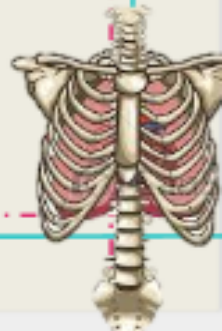
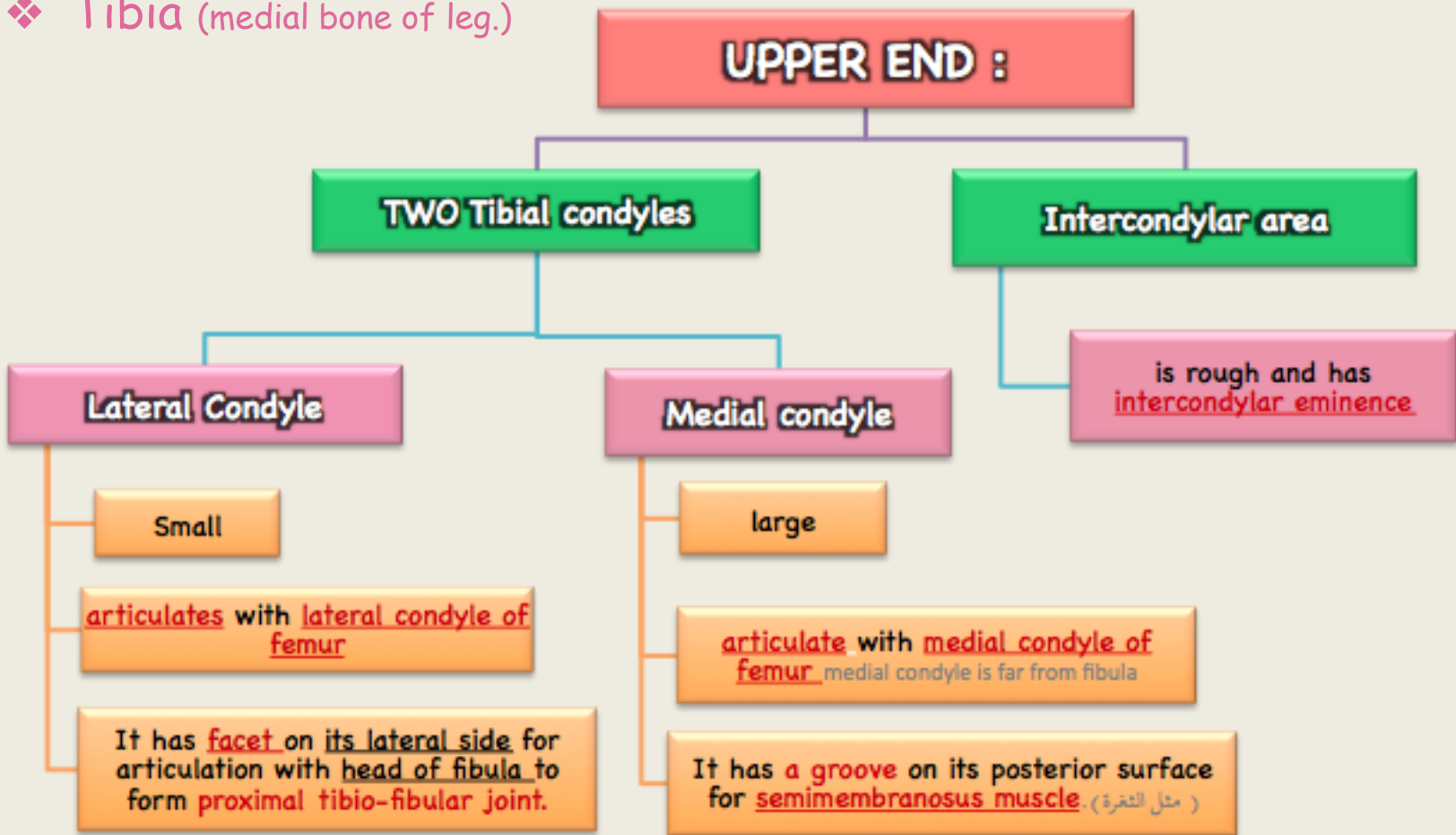


-the ligament of the patella is made up from the quad recipes

(1) is a small bone embedded within a tendon.

BONES OF LEG (Tibia and Fibula)

❖ Tibia (medial bone of leg.)



-tibia's upper end is larger than lower end

BONES OF LEG (Tibia and Fibula)

❖ Tibia (medial bone of leg.)

-Shaft :

Tibial tuberosity:

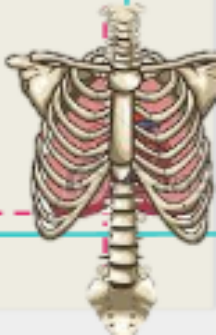
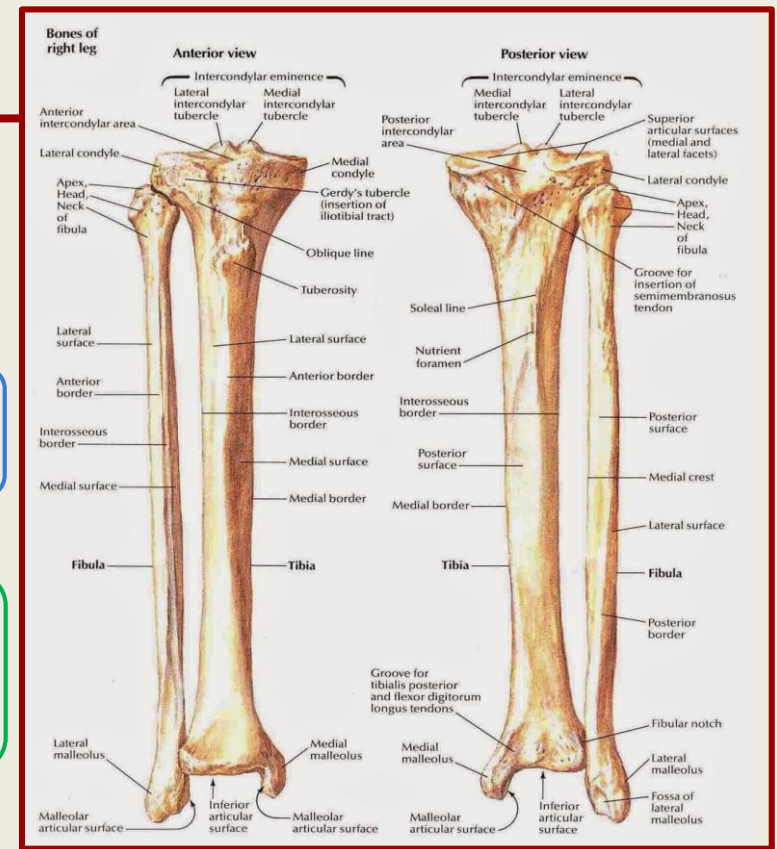
- Its upper smooth part gives **attachment** to **ligamentum patellae**.
- Its lower rough part is **subcutaneous**

THREE borders:

- **Anterior border** is **sharp** and **subcutaneous** (the tuberosity on the superior part of it)
- **Medial border**
- **Lateral border** also called "**interosseous border**".
n.p:medial and lateral borders are rough.

THREE surfaces

- **Medial** : **subcutaneous**.
n.p:it is between anterior and medial border
- **Lateral**
- **Posterior** has **oblique line**, **soleal line** for **attachment of soleus muscle**



-Interosseous membrane is between lateral border of tibia and medial border of fibula.
-the surface between the anterior border and medial border is medial (the sharp subcutaneous shaft of the tibia)

BONES OF LEG (Tibia and Fibula)

❖ **Tibia** (medial bone of leg.)

- lower end:

Articulates with talus for formation of ankle joint.

n.p: talus is the only one that articulates with tibia and fibula

Its medial surface is subcutaneous (medial malleolus)

Its lateral surface articulate with talus

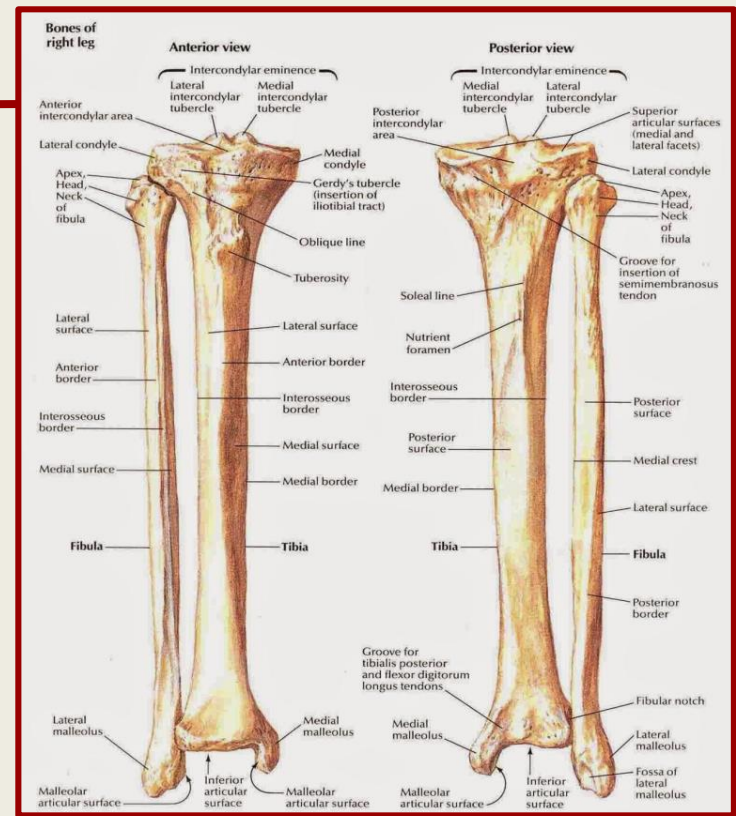
Fibular notch lies on its lateral surface of lower end to form distal tibiofibular joint

-Position of tibia (Right or Left) :

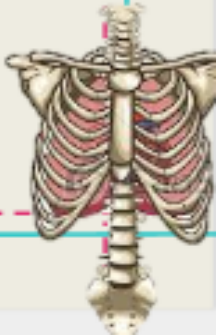
Upper end is larger than lower end

Medial malleolus is directed downward and medially

Shaft has sharp anterior border



[Tibia and Fibula visual video](#)



BONES OF LEG (Tibia and Fibula)

❖ Fibula (slender lateral bone of leg)

- It takes no part in articulation of knee joint (take a part in ankle joint)& it gives maximum attachment to the muscles

Upper end:

Head: articulates with lateral condyle of tibia

Styloid process

Neck

shaft:

FOUR border

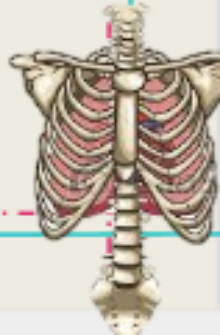
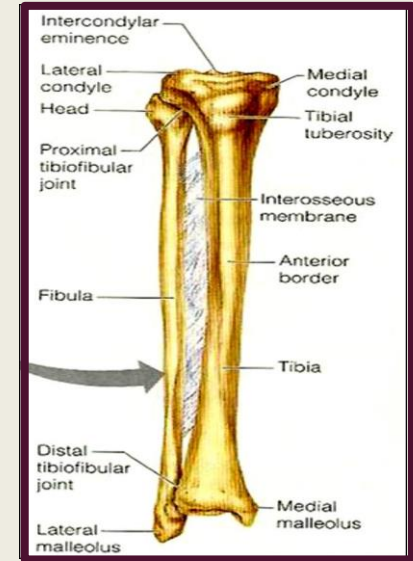
Medial interosseous border gives attachment to interosseous membrane

FOUR surfaces .

lower end:

Lateral malleolus is subcutaneous

Its medial surface is smooth for articulation with talus to form ankle joint



Bones of FOOT



*telles bone
=tarsal bone

Remember:
7 tarsals in foot,
8 carpels in wrist

7 Tarsal bones:

start to ossify before birth and end ossification⁽²⁾ by 5th year in all tarsal bones. They are :

- 1- Calcaneum. شكلها مكافئ
- 2- Talus .
- 3- Navicular. (curved appearance)
- 4- Cuboid.
- 5- Three cuneiform bones.

Only **Talus** articulates with tibia & fibula at ankle joint.

Calcaneum: the largest bone of foot, forming the heel.

Remember:
in the hands we count lateral (thumb) to medial (pinkie)

5 Metatarsal bones:

- They are numbered from **medial** (big toe) to **lateral**.
- **1st** metatarsal bone is large and lies **medially**.
- Each metatarsal bone has a **base** (proximal), a **shaft** and a **head** (distal).

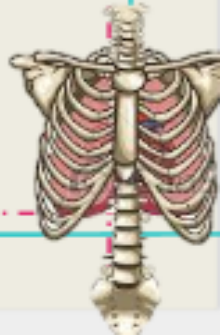
14 phalanges:

- **TWO** phalanges for big toe (proximal & distal)
- **THREE** phalanges for each of the lateral 4 toes (proximal, middle & distal)
- Each phalanx has base, shaft and a head.

“MNEMONIC “ to make it easier to memorize The sequence”

Tiger Cubs Need MLC

[Bones of the foot visual video](#)



-holloss = great toe
-pollos = thumb

(2) is the process of laying down new bone material by cells called osteoblasts.

MCQ's



1-The gluteus maximus muscle is attached to the greater trochanter:

- a) True
- b) False

2-The patella is the largest sesamoid bone in the body:

- a) True
- b) False

3-The ligamentum patellae of the patella is connected to tuberosity of tibia:

- a) True
- b) False

4-Calcaneum and talus are the only bones that articulate with tibia and fibula at ankle joint:

- a) True
- b) False

5-A thick posterior border of the shaft of femur is called:

- a) Fovea capitis
- b) Intertrochanteric crest
- c) Linea aspera
- d) Gluteal tuberosity

6-Which one of the following tarsal bones forms the heel:

- a) Talus
- b) Calcaneum
- c) Navicular
- d) Cuboid

7-Which one of the following is not a surface for FEMUR:

- a) Anterior
- b) Medial
- c) Lateral
- d) Posterior

8-Which of the following is not a border for TIBIA:

- a) Anterior
- b) Medial
- c) Lateral
- d) Posterior

9-The Triangular area that lies at the lower end of the femur shaft is called:

- a) Lateral condyle
- b) Patellar groove
- c) Popliteal surface
- d) Medial condyle

10-The area between the lateral and medial condyle in the posterior of the FEMUR:

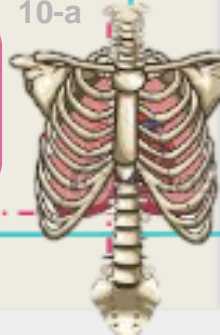
- a) Intercondylar fossa
- b) Patellar surface
- c) Linea aspera
- d) Popliteal surface

Answers:

- 1-b
- 2-a
- 3-a
- 4-b
- 5-c
- 6-b
- 7-d
- 8-d
- 9-c
- 10-a

Extra questions (not all are included):

[Lower Limb Anatomy MCQs](#)



Tiger
Cubs Need
MILK



GOOD
LUCK

Done By Anatomy Team 434 ..

