

# Lab Exercise 7

## Appendicular Skeleton

### Articulations (Joints)

Textbook Reference: See Chapters 7 and 8

#### **What you need to be able to do on the exam after completing this lab exercise:**

Be able to name all the listed bones and bone features of the shoulder girdle.

Be able to differentiate between a right scapula and a left scapula.

Be able to name all the listed bones and bone features of the proximal limbs (humerus and femur).

Be able to differentiate between a right humerus and a left humerus.

Be able to differentiate between a right femur and a left femur.

Be able to name all the listed bones and bone features of the distal limbs (radius, ulna, tibia, and fibula).

Be able to identify/name the three bones that make up the pelvis.

Be able to name all the listed bone features of the pelvis.

Be able to differentiate between a male pelvis and a female pelvis.

Be able to name all the listed bones of the hands and feet.

Be able to name all the listed parts of a synovial joint on the synovial joint model of the knee joint.

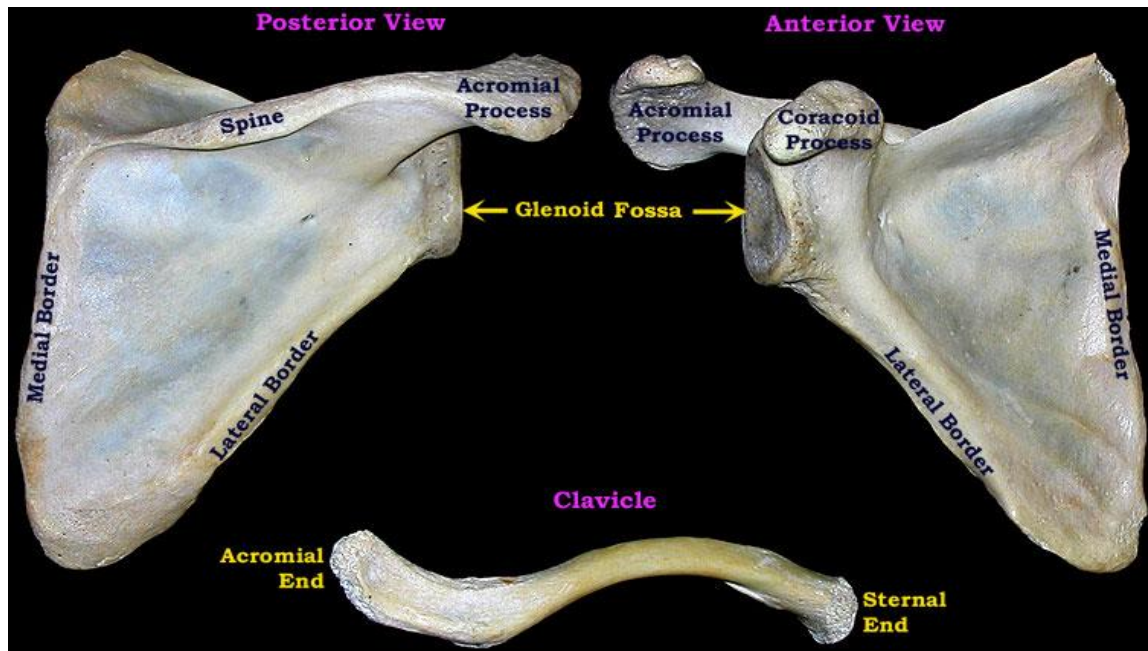
Be able to name the listed ligaments of the shoulder joint, hip joint, knee joint, and elbow joint.

## Appendicular Skeleton

The Appendicular Skeleton includes the **shoulder girdle**, **upper limbs**, **pelvic girdle**, and **lower limbs**.

**\*\*Know all the listed bones and bone features on the bones in the lab.**

The Shoulder (Pectoral) Girdle includes the **scapula** (shoulder blade) and the **clavicle** (collar bone).



### Right Scapula

Acromial process	Lateral border
Coracoid process	Medial border
Glenoid fossa	Spine

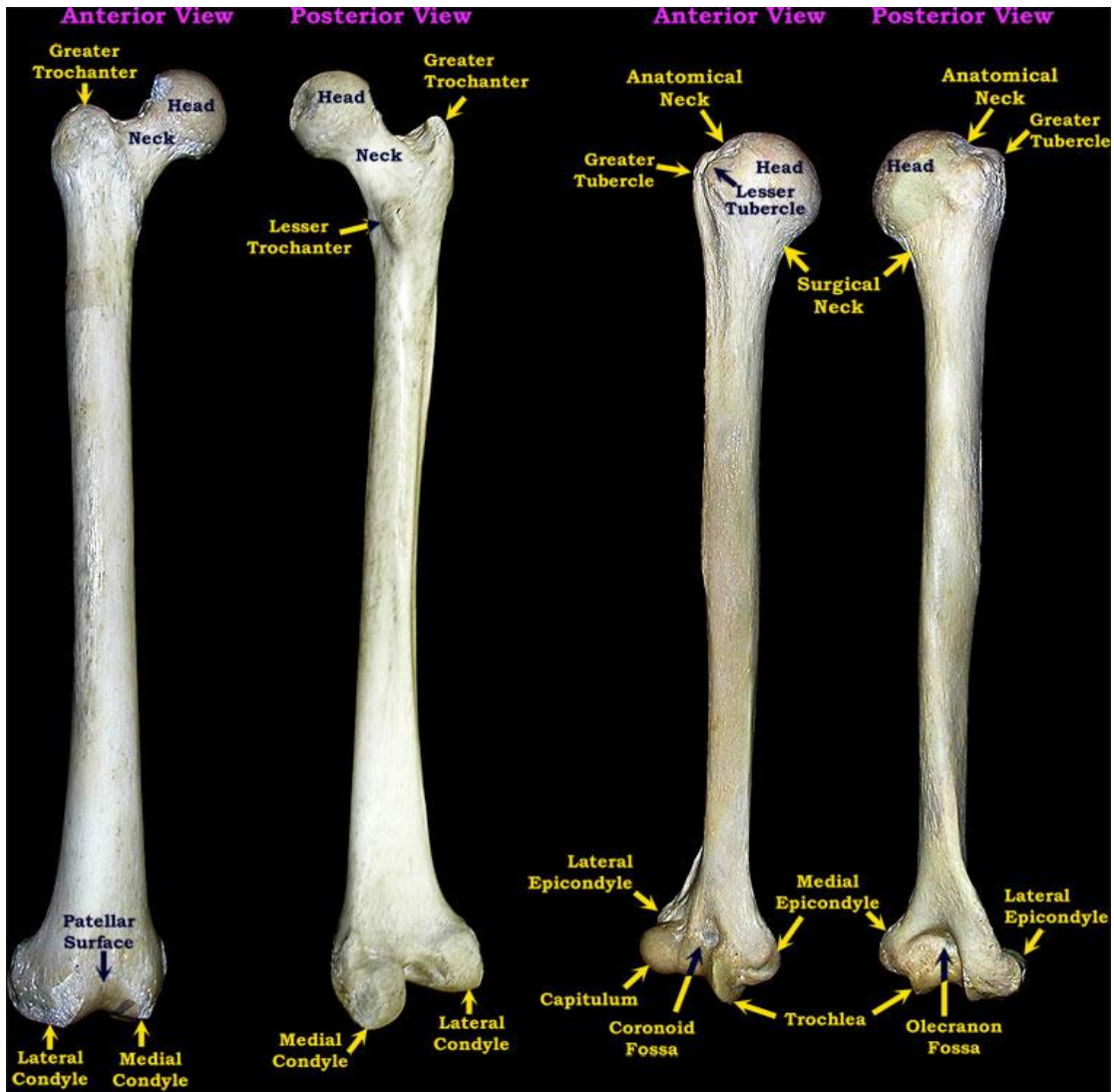
### Clavicle

Acromial end	Sternal end
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**\*\*Be able to distinguish the right scapula from the left scapula.**

In order to determine if a scapula is right or left, orient it so the glenoid fossa (articulating surface) faces laterally (outward) and the spine is posterior (toward back) and superior (upper). The coracoid process should be superior and anterior.

Proximal Limbs (Femur – 2 on left and Humerus – 2 on right)

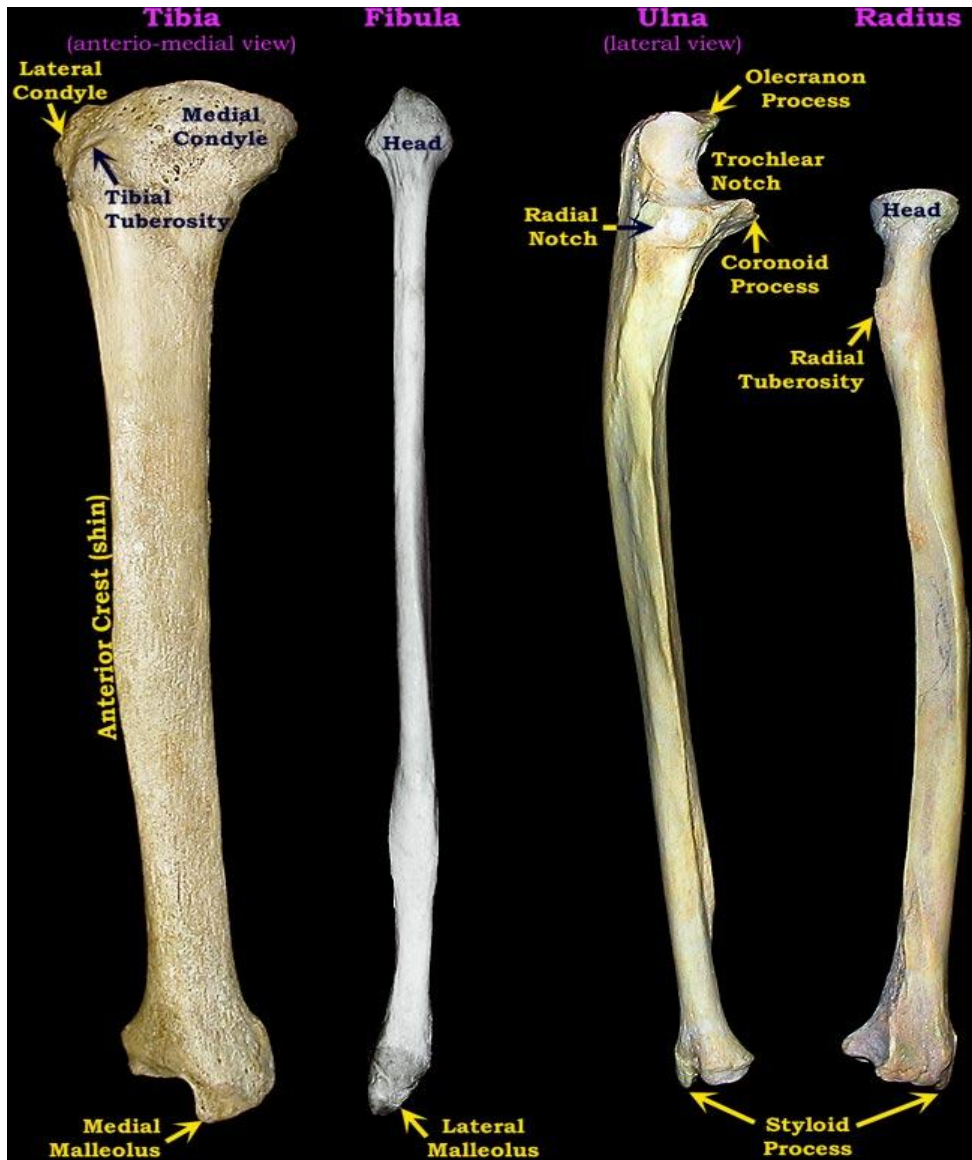


**\*\*Be able to distinguish the right femur and humerus from the left femur and humerus.**

**Identification:** These two bones both are large and have a distinct rounded head, allowing for a great range of movement. The femur has a distinct neck separating the head from the rest of the bone, while the humerus lacks such a neck.

**Determining side:** In order to distinguish right from left, first orient the bones so that the rounded head is superior (up) and pointing medially (toward the body's midline). Then you will need to determine the anterior vs. posterior side. On the femur, look for the patellar surface, which is anterior. Also note how the articulating surfaces of the condyles extends far back on the posterior side (since the knee bends back but not forward). On the humerus, look for the deep olecranon fossa on the posterior side (where the olecranon process of the ulna fits in when the elbow is straightened). Both specimens above are from the right side.

Distal Limbs (from left to right – Tibia, Fibula, Ulna Radius)

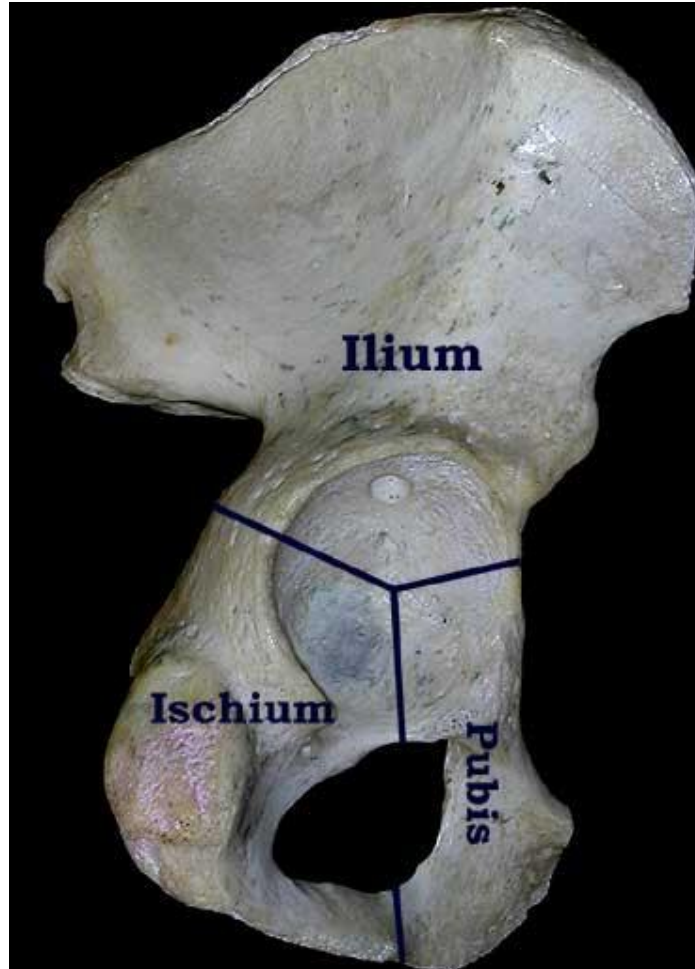


**Identification:** The tibia is a large, heavy bone and thus potentially confused with the femur or humerus. Note that its superior end is rather flat-topped and lacks any sort of a rounded head. The other three bones are more slender and could be confused with each other. The fibula is distinguished by being longer and proportionately more slender than any other bone (the specimens are not quite to scale here). Also note that it is enlarged and *pointed* at *both* ends. The ulna is best identified by the distinctive U-shaped notch made by the olecranon and coracoid processes (think **U** for **Ulna**). The radius' most distinctive feature is the nearly perfectly round, flat-topped head (think radial).

**Determining side:** You only need to tell right from left for the tibia, not the smaller bones. To do so, first orient the tibia so that the larger flatter end is superior (up). The anterior crest (shin) should of course be anterior (front). Finally, the medial side can be determined by the medial malleolus (remember that the malleoli bracket the ankle and since the tibia is the medial bone of the lower limb, its malleolus must be medial). A right tibia is shown.

Pelvis – Ilium, Ischium, and Pubis

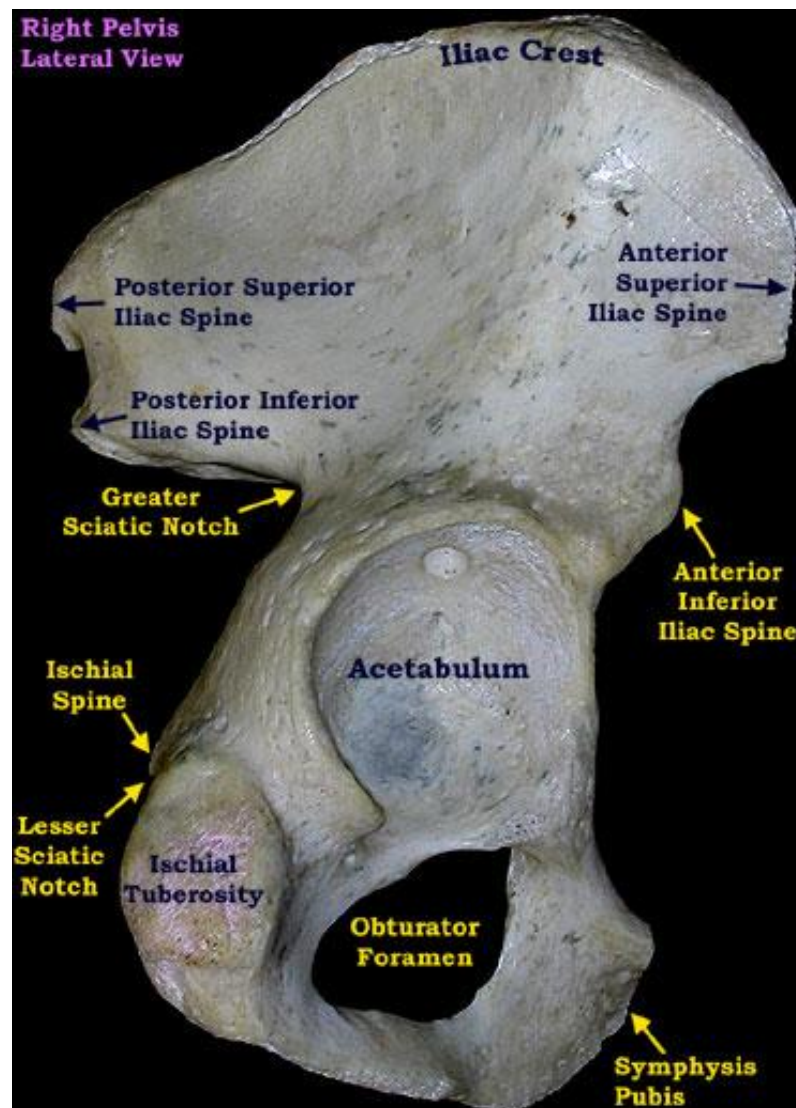
The photo below indicates the three fused bones that make up the pelvis.



## Pelvis

**\*\*Know the bone features of the pelvis listed in the picture below.**

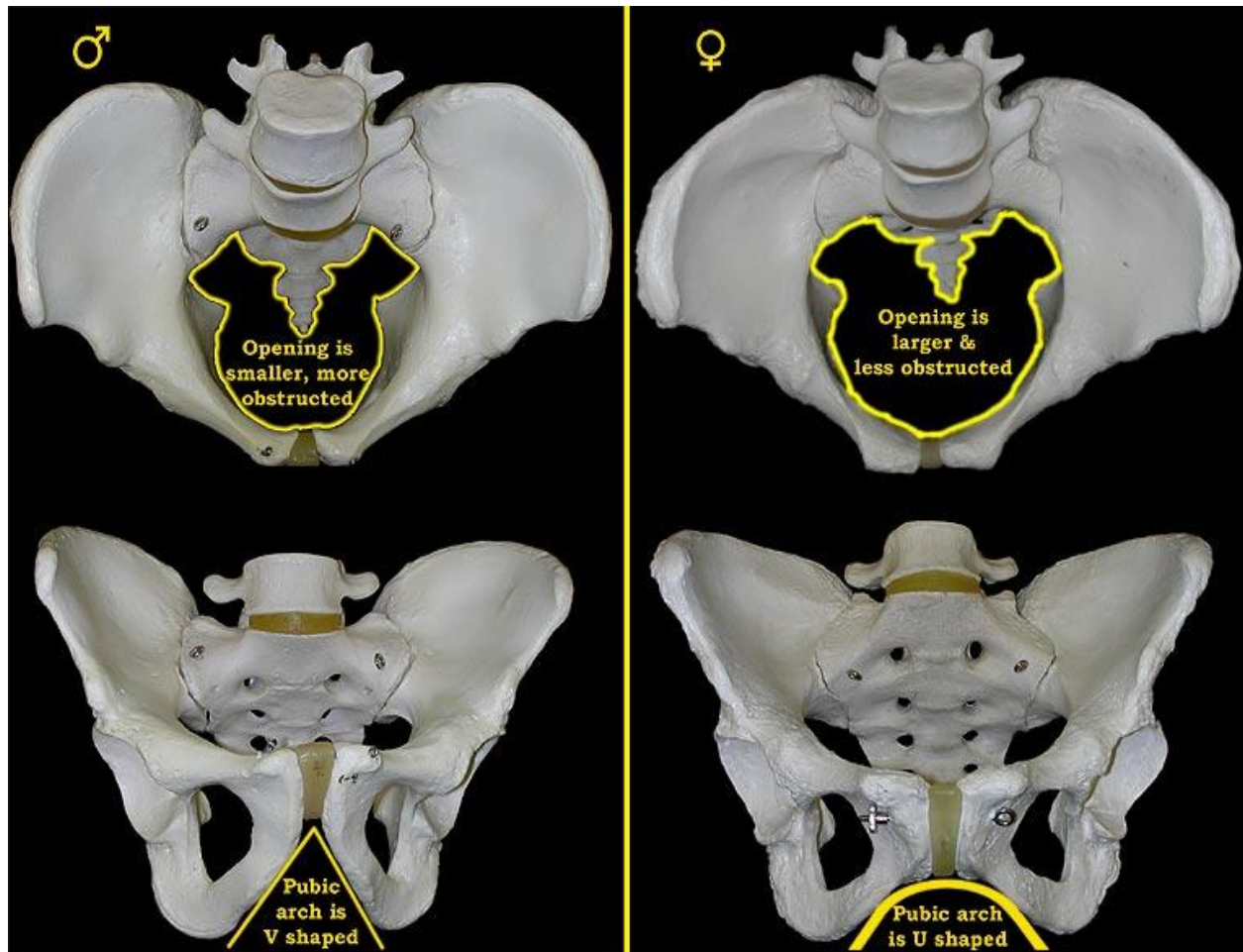
In order to determine if a pelvis is right or left, hold it with acetabulum facing laterally and the obturator foramen inferior (down). Now all you need to do is determine which side is anterior vs posterior, which can be done by looking for the pubic symphysis (anterior) or the sciatic notches (posterior). The specimen in the photo is a right pelvic bone.



## The Difference Between a Male Pelvis and a Female Pelvis

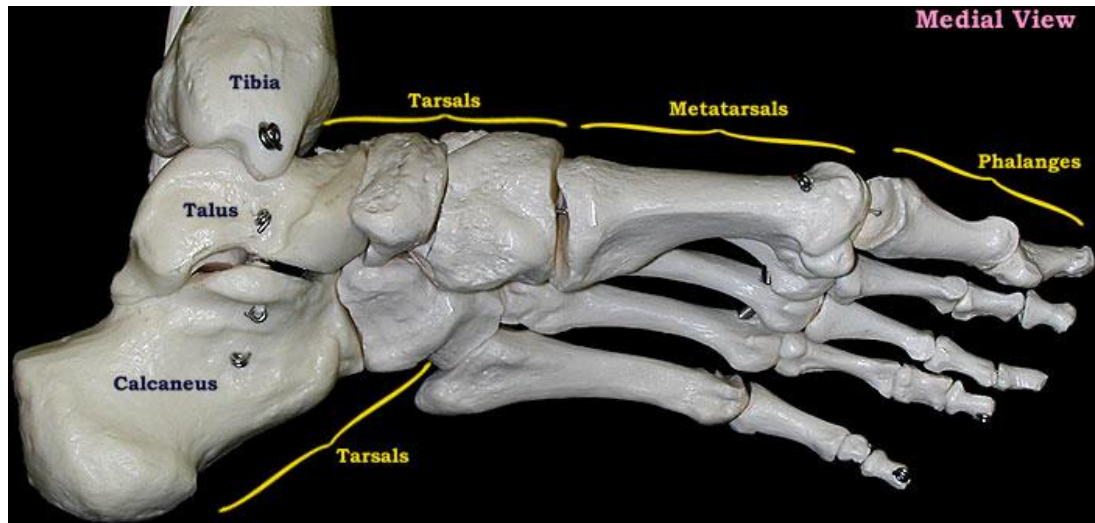
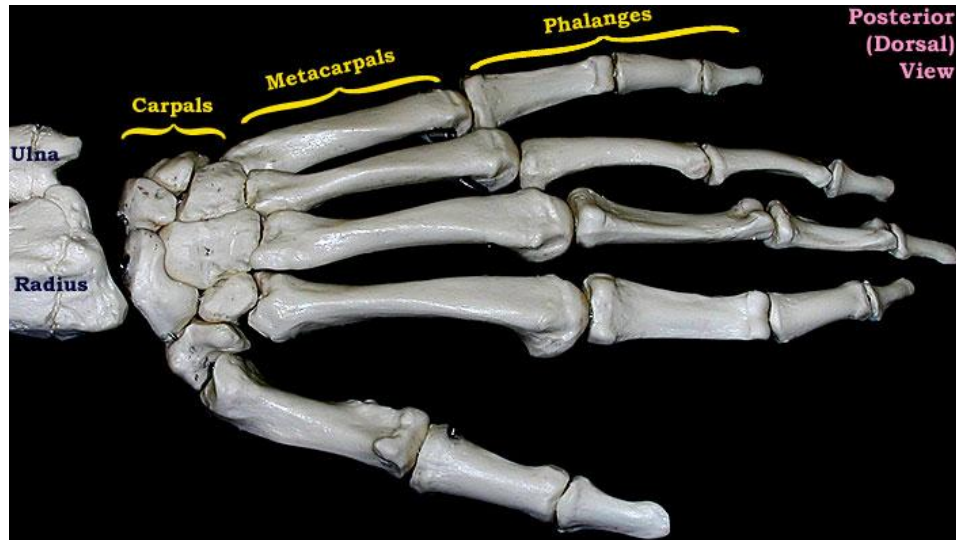
**\*\*Know the difference between a male pelvis and a female pelvis.**

In the pictures below, the male pelvis is on the left and the female pelvis is on the right.



Hands and Feet

**\*\*Know the bones of the hands and feet, as shown in the pictures below.**





## Articulations/Joints

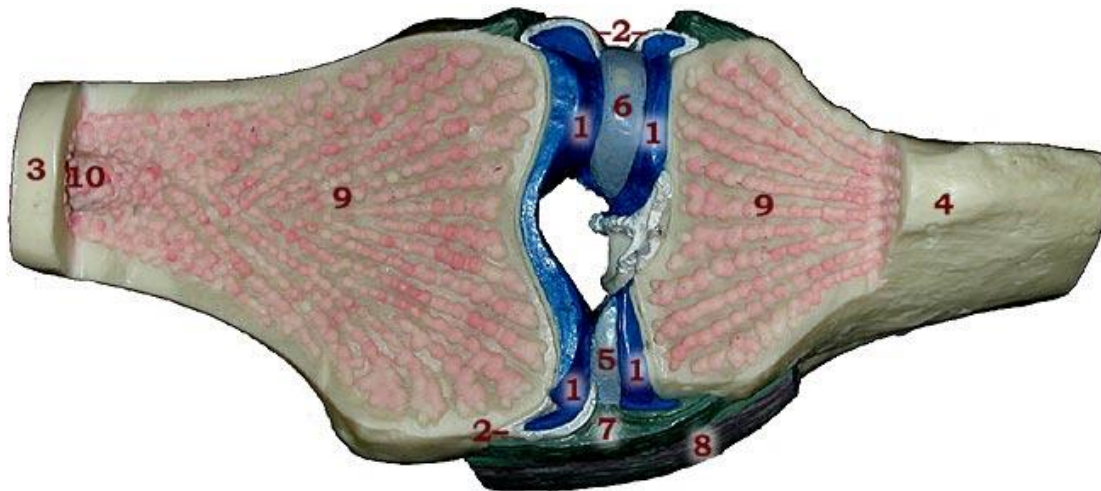
**Articulations** are where two bones join together.

Three structural classifications of joint:

1. Fibrous joints – sutures, tibiofibular joints, radioulnar joints, and gomphosis joints (between tooth and jaw)
2. Cartilaginous joints – intervertebral joints, pubic symphysis, joint between manubrium and sternum, and epiphyseal plate
3. Synovial joints – most of the joints of the limbs

### Synovial Joint Structure (Knee Joint Model)

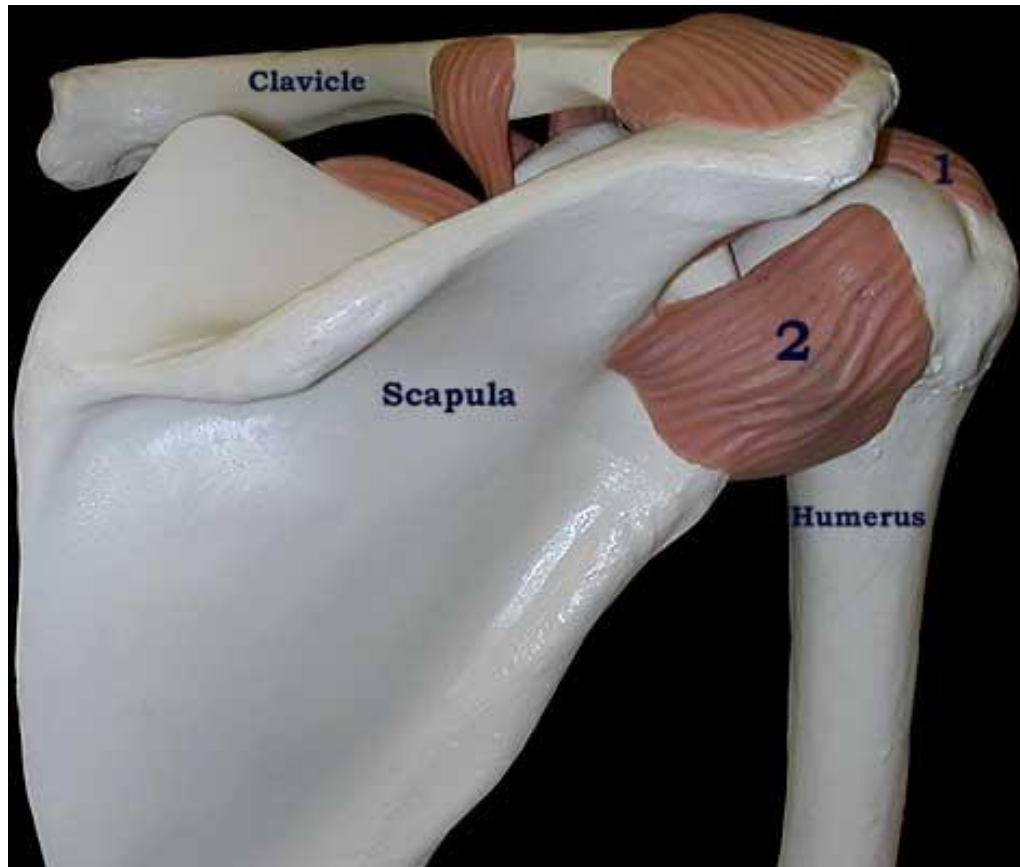
**\*\*Know the following parts of the synovial joint structure.**



- |                              |   |
|------------------------------|---|
| 1. Synovial Fluid (blue)     | 6. Lateral Meniscus                     |
| 2. Synovial Membrane (white) | 7. Fibrous Capsule (green)              |
| 3. Femur                     | 8. Tibial Collateral Ligament (gray)    |
| 4. Tibia                     | 9. Spongy (Cancellous) Bone             |
| 5. Medial Meniscus           | 10. Medullary (Marrow) Cavity (opening) |

## Shoulder Joint

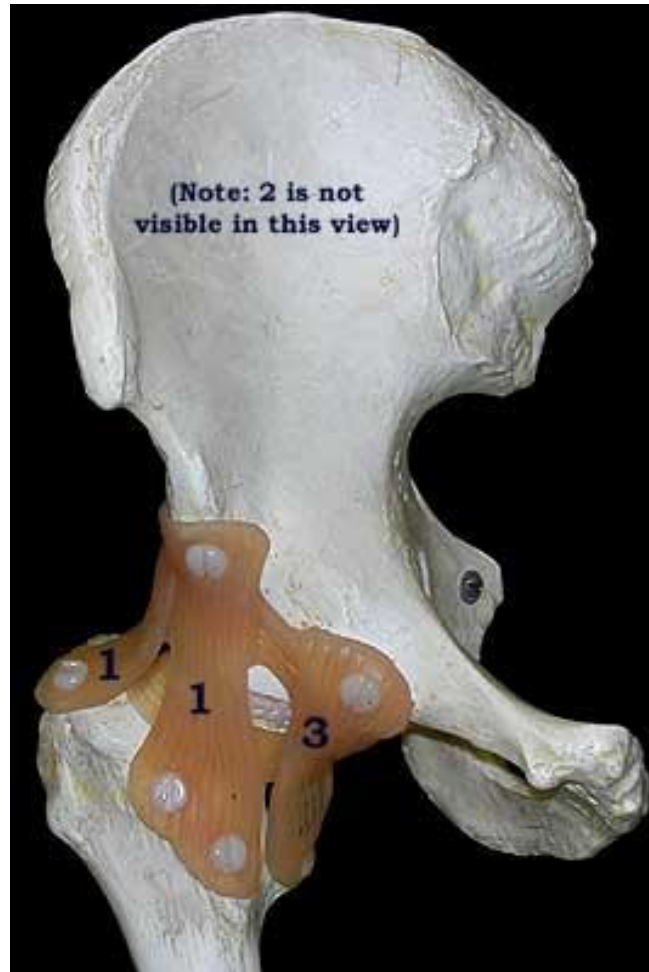
**\*\*Know the following ligaments of the shoulder joint.**



1. Coracohumeral Ligament
2. Glenohumeral Ligament

## Hip Joint

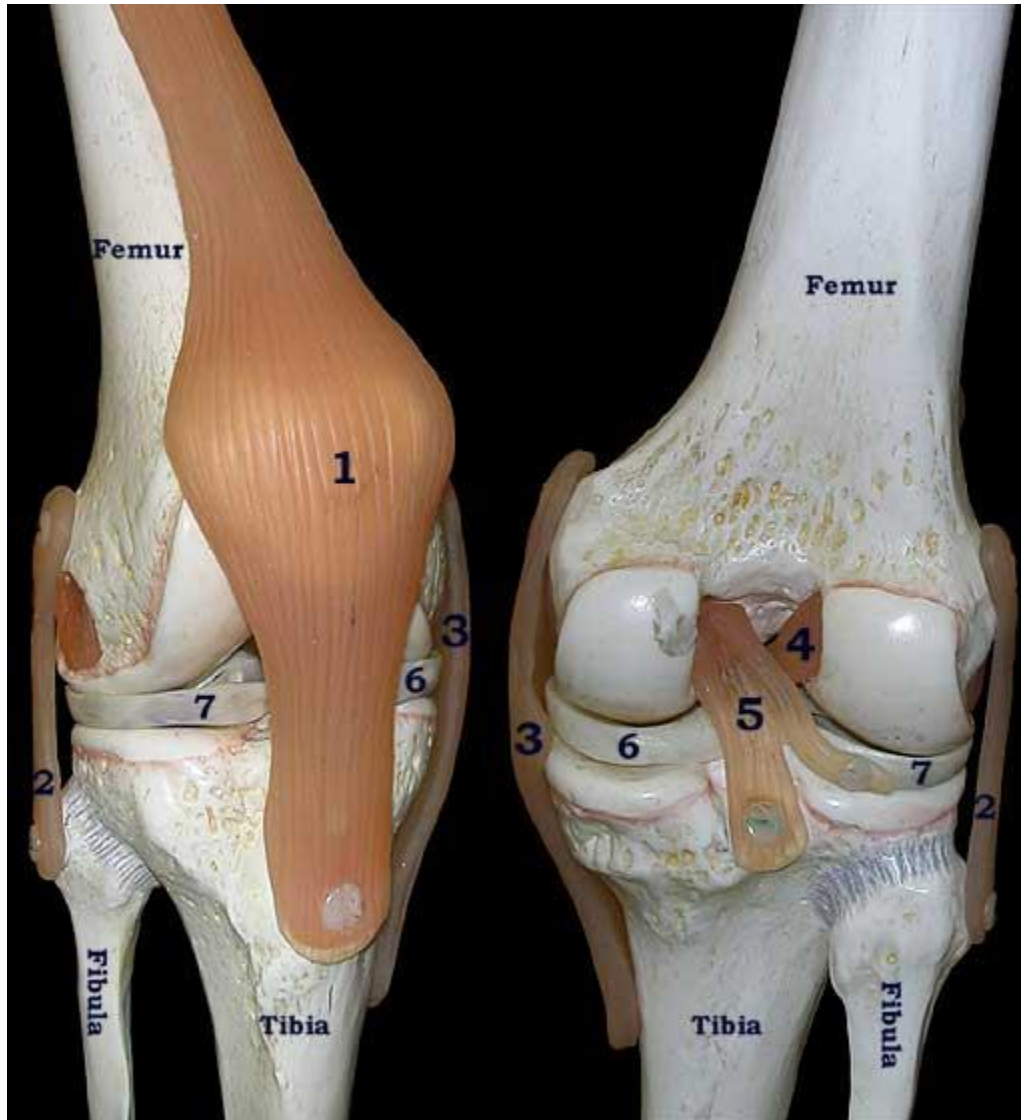
**\*\*Know the following ligaments of the hip joint.**



1. Iliofemoral Ligament
2. Ischiofemoral Ligament
3. Pubofemoral Ligament

## Knee Joint

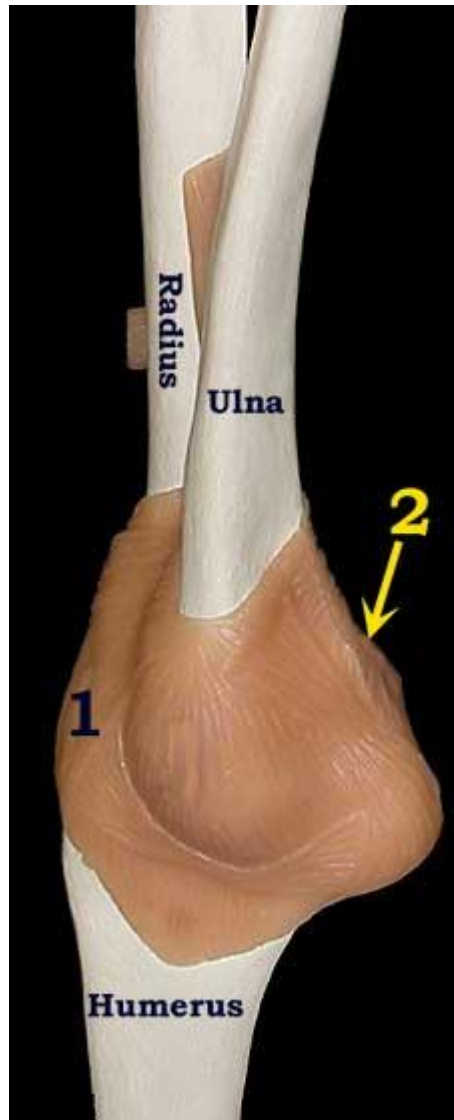
**\*\*Know the following ligaments and cartilage of the knee joint.**



- |  |                       |
|--|-----------------------|
| 1. Patellar Ligament                     | 5. Posterior Ligament |
| 2. Lateral (Fibular) Collateral Ligament | 6. Medial Meniscus    |
| 3. Medial (Tibial) Collateral Ligament   | 7. Lateral Meniscus   |
| 4. Anterior Cruciate Ligament            |                       |

## Elbow Joint

**\*\*Know the following ligaments of the elbow joint.**



1. Lateral (Radial) Collateral Ligament
2. Medial (Ulnar) Collateral Ligament