JOINTS

SUMMER BOOKLET

Learning objectives:

- Planes of movement
- Movement terminology
- Joints- articulations, movement and muscles used.

Hello,
I will be teaching the Anatomy & Physiology part of the course. The syllabus can be found on page 12 on the link below
https://www.ocr.org.uk/Images/234833-specification-accredited-a-level-gce-physical-education-h555.pdf:

As part of your summer task, I would like you to research the first section of the course.

You will need to follow the booklet filling in the spaces and tables as you go.

It is beneficial to remember your movements and muscles in pairs, eg.
Flexion/ extension of the elbow
Bicep brachii/ Tricep Brachii

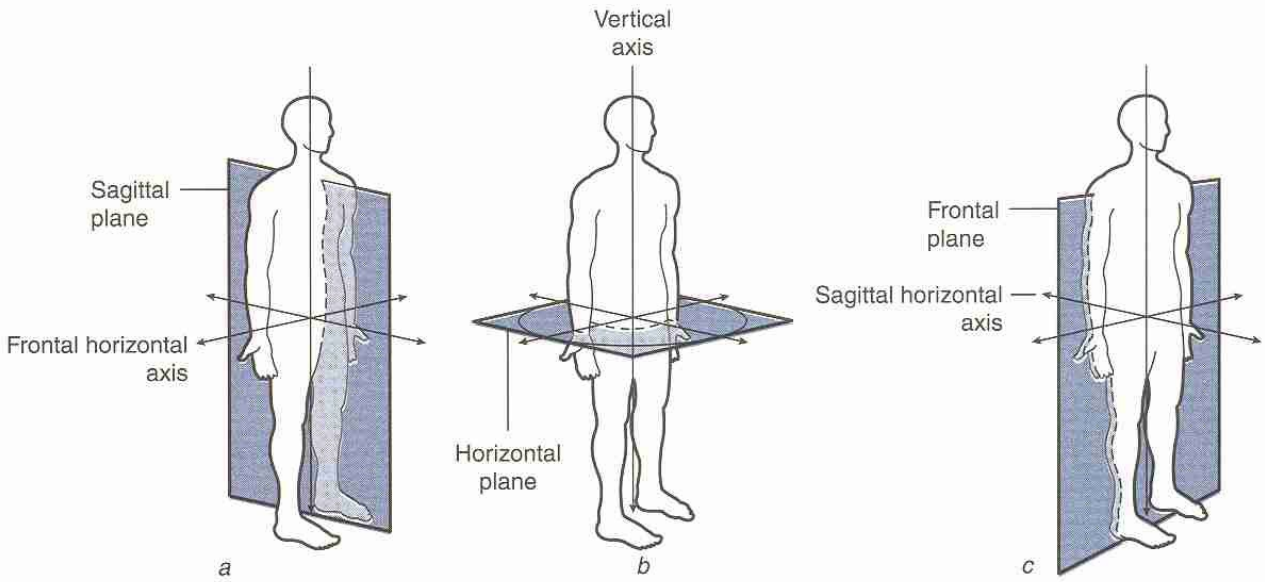
This will help you when you do exam questions.

I have also attached some example exam questions which I would like you to complete.

Hope you are all well and staying safe!

Take care
Mrs Murphy

Planes of Movement

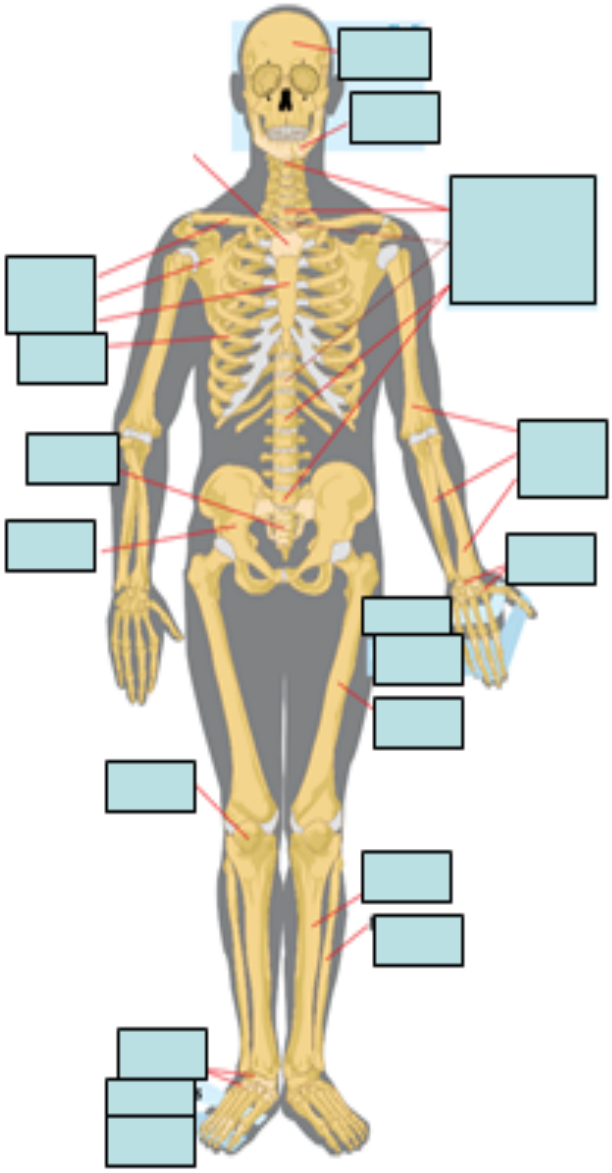


There are 3 planes of movement that we need to be aware of:

1. Frontal plane
2. Horizontal plane
3. Sagittal plane

KEY TERMS

- ANATOMICAL POSITION
- ANTERIOR
- POSTERIOR
- SUPERIOR
- INFERIOR
- MEDIAL
- LATERAL



B Blood Cell Production

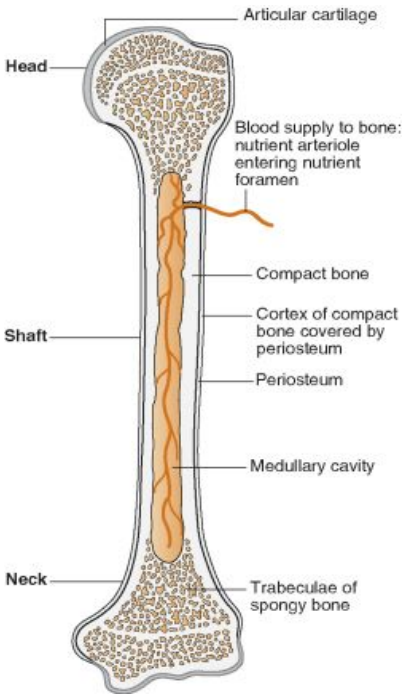
S Support/ Shape

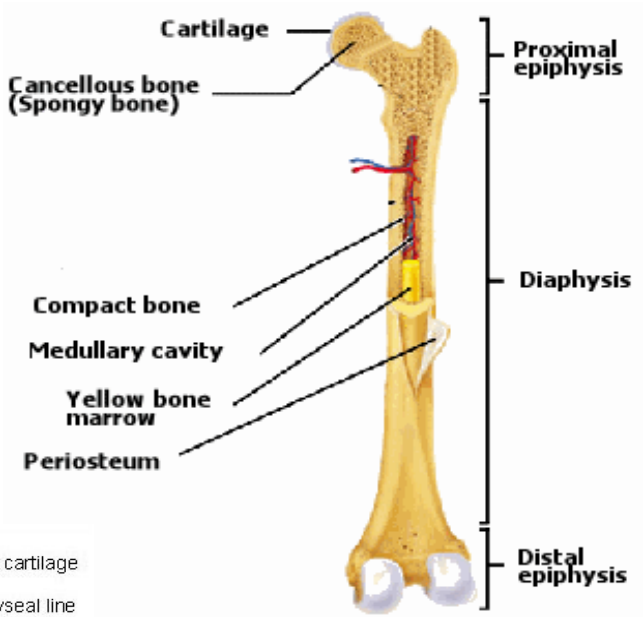
P Protection

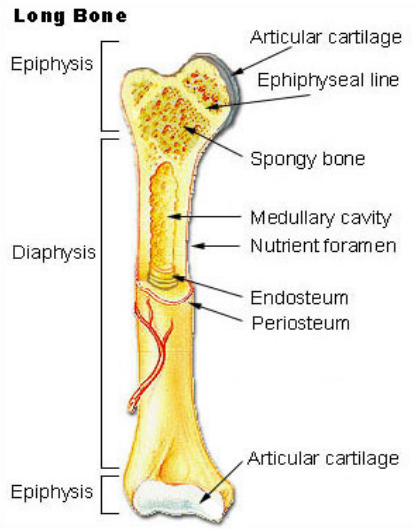
A Attachment/ movement

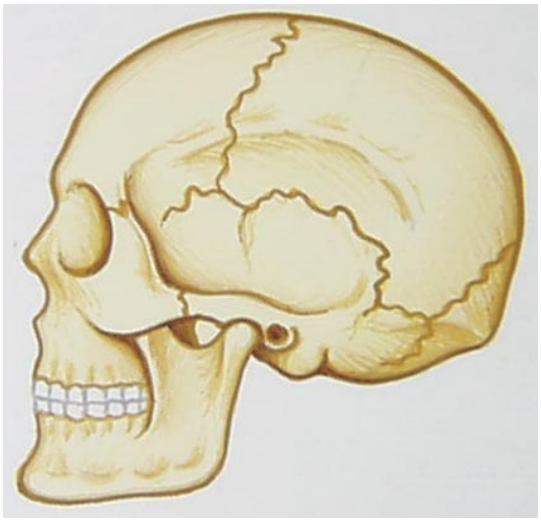
M Mineral storage (calcium)

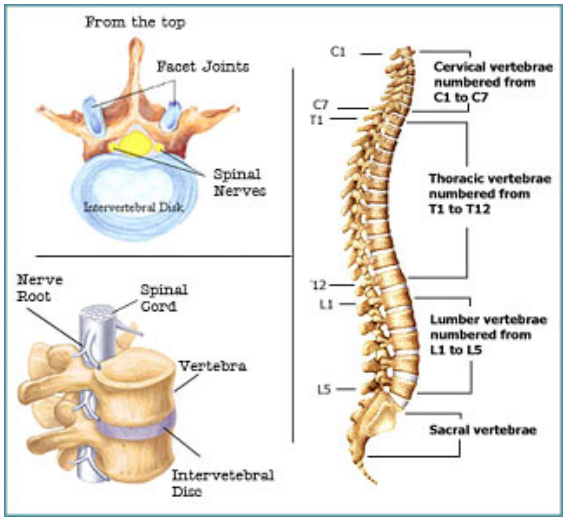
Long Bones


Articular cartilage
Head
Blood supply to bone: nutrient arteriole entering nutrient foramen
Compact bone
Shaft
Cortex of compact bone covered by periosteum
Periosteum
Medullary cavity
Neck
Trabeculae of spongy bone


Cartilage
Cancellous bone (Spongy bone)
Compact bone
Medullary cavity
Yellow bone marrow
Periosteum
Proximal epiphysis
Diaphysis
Distal epiphysis


Long Bone
Epiphysis
Articular cartilage
Ephiphyseal line
Spongy bone
Diaphysis
Medullary cavity
Nutrient foramen
Endosteum
Periosteum
Articular cartilage
Epiphysis

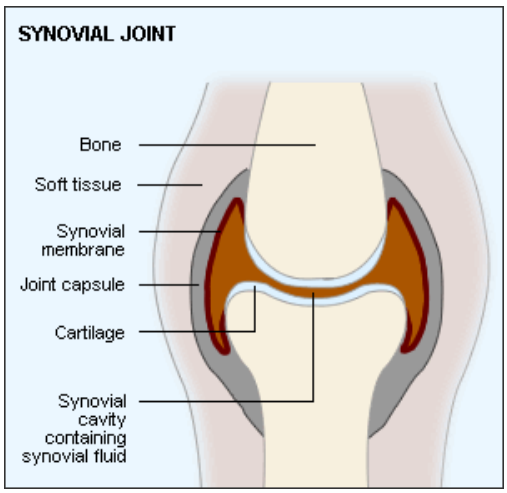




Fibrous/ Fixed Joint

Cartilaginous Joint

Synovial Joint

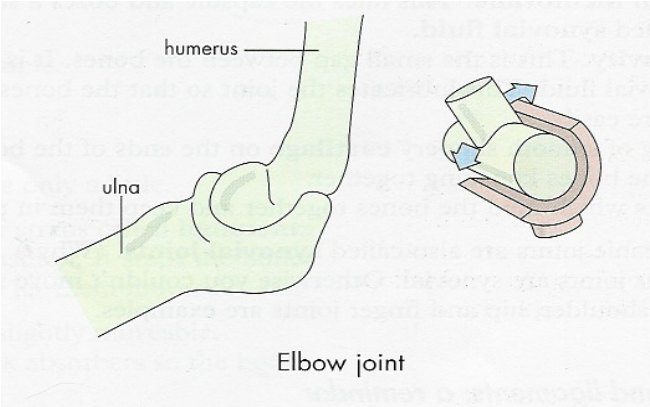


FEATURE	STRUCTURE	FUNCTION
Ligament		
Synovial Fluid		
Articular cartilage		
Joint capsule		

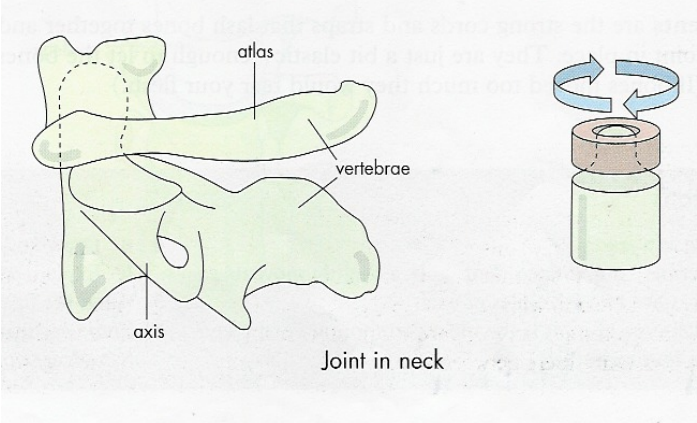
SYNOVIAL JOINTS

Synovial joints can be divided into 6 categories.

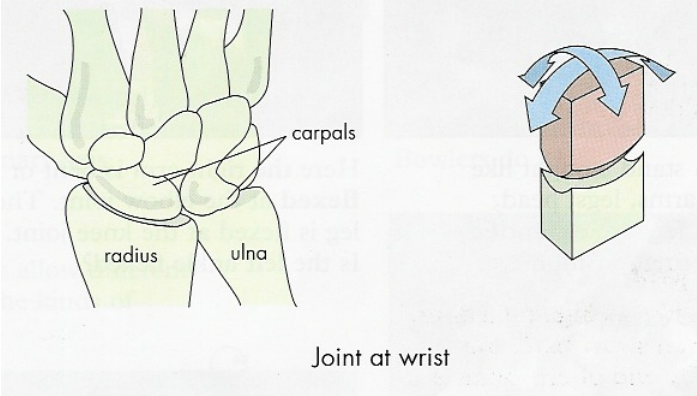
Hinge joint



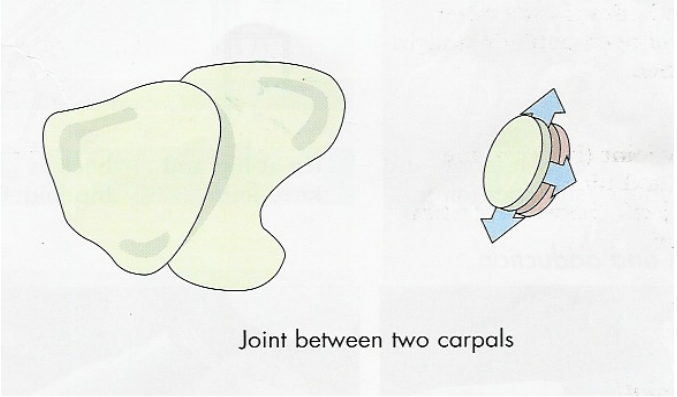
Pivot Joint



Condyloid Joint

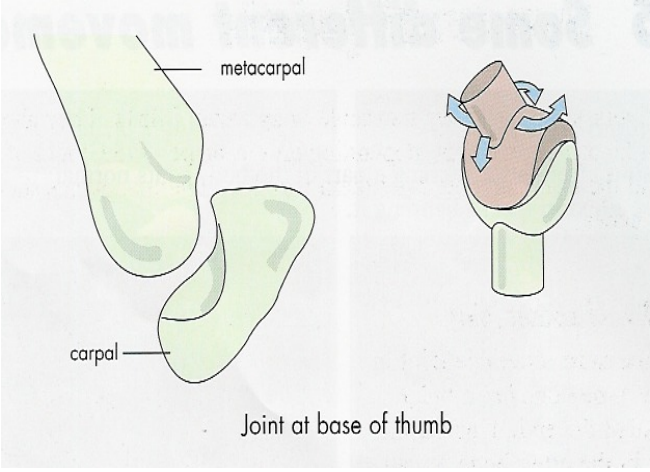


Gliding Joint



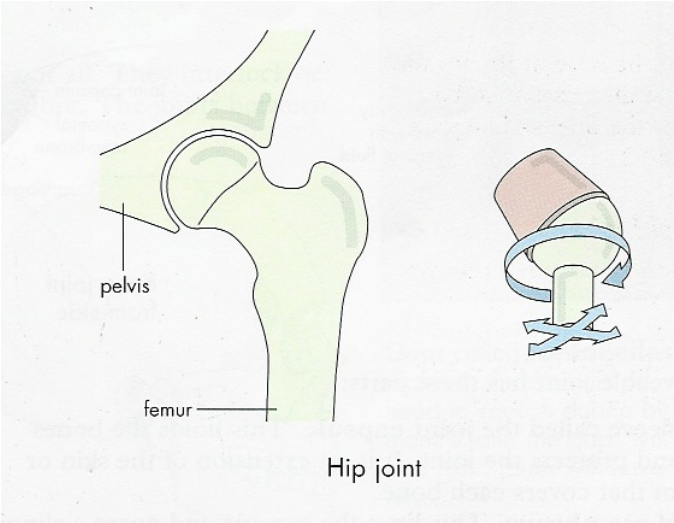
Joint between two carpals

Saddle Joint



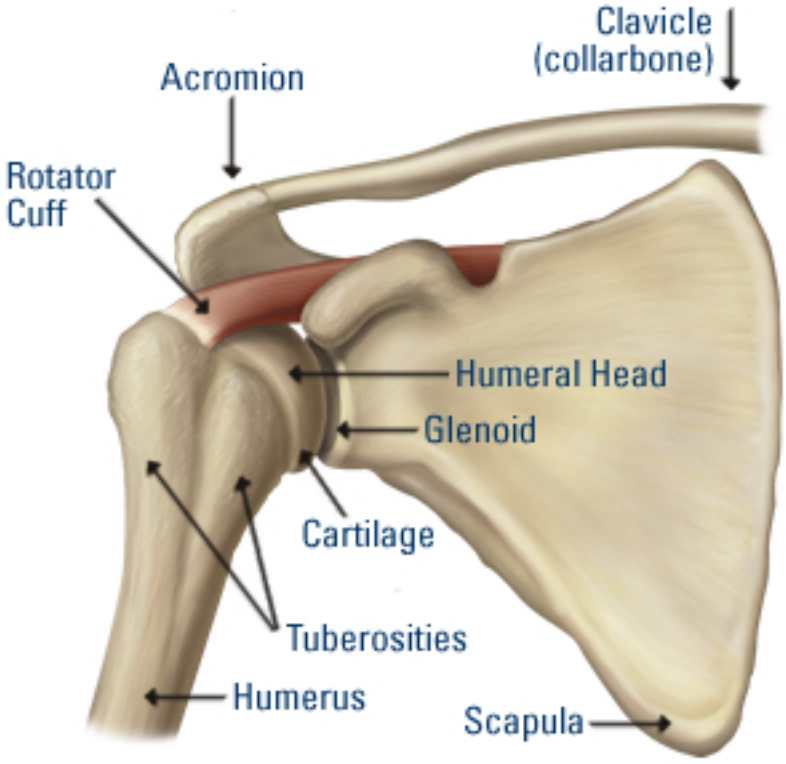
Joint at base of thumb

Ball and Socket

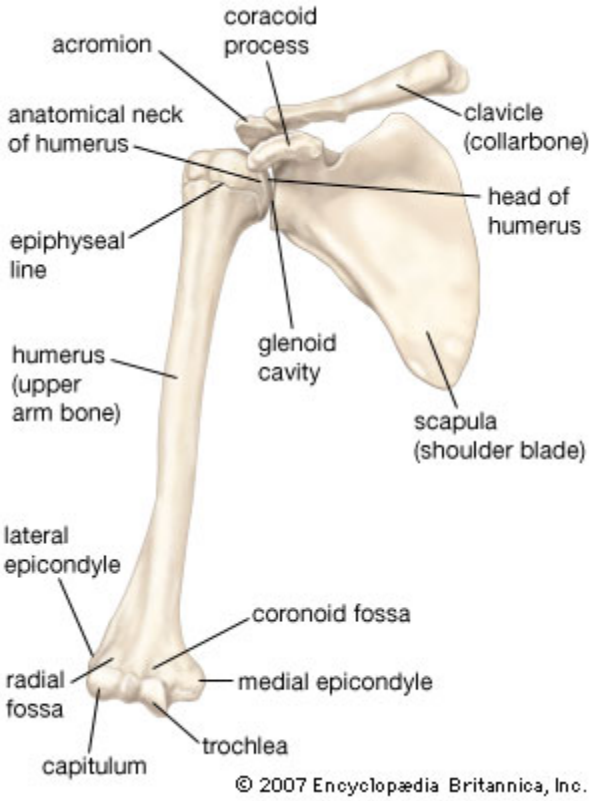


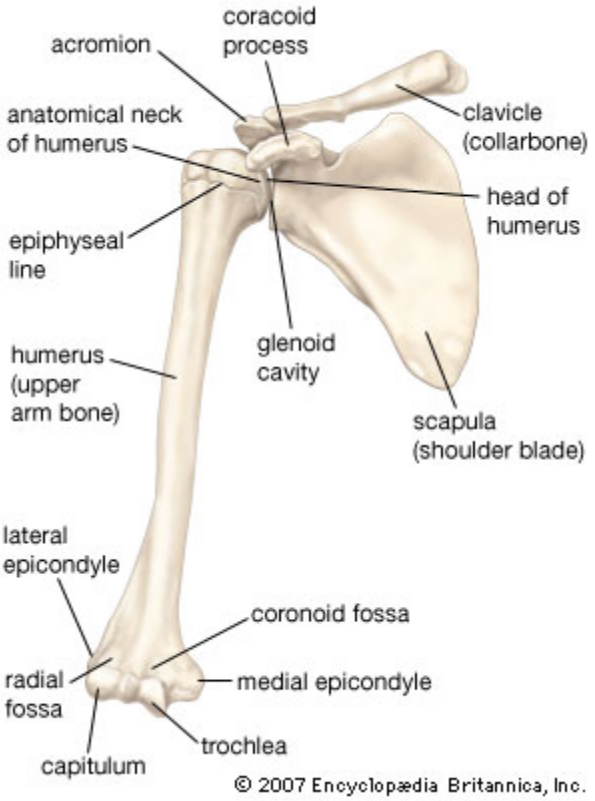
Hip joint

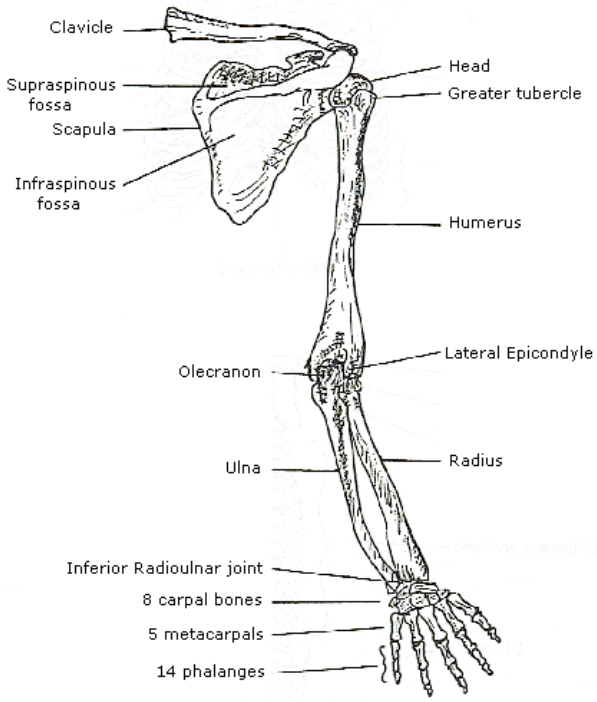
SHOULDER JOINT

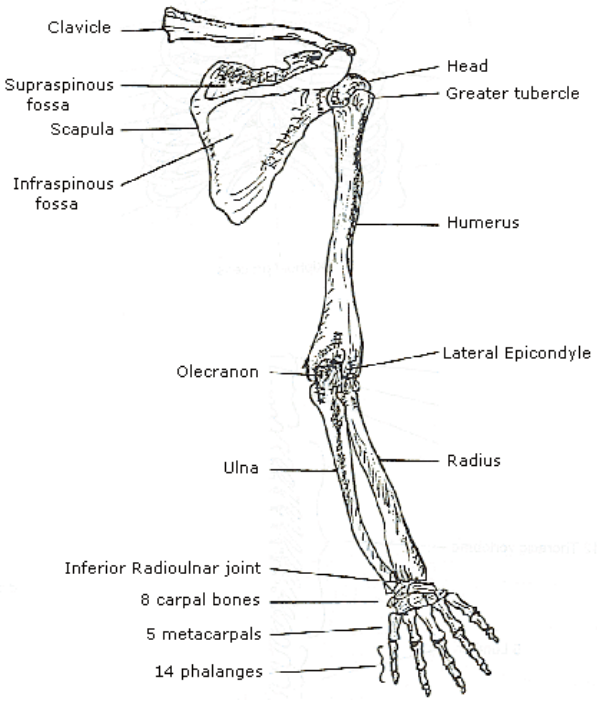


TYPE OF JOINT	ARTICULATING BONES	MOVEMENT	AGONIST	ANTAGONIST	SPORTING E.G


acromion
coracoid process
clavicle (collarbone)
anatomical neck of humerus
head of humerus
epiphyseal line
glenoid cavity
humerus (upper arm bone)
scapula (shoulder blade)
lateral epicondyle
coronoid fossa
radial fossa
medial epicondyle
trochlea
capitulum
© 2007 Encyclopædia Britannica, Inc.


acromion
coracoid process
clavicle (collarbone)
anatomical neck of humerus
head of humerus
epiphyseal line
glenoid cavity
humerus (upper arm bone)
scapula (shoulder blade)
lateral epicondyle
coronoid fossa
radial fossa
medial epicondyle
trochlea
capitulum
© 2007 Encyclopædia Britannica, Inc.


Clavicle
Supraspinous fossa
Scapula
Infraspinous fossa
Head
Greater tubercle
Humerus
Olecranon
Lateral Epicondyle
Ulna
Radius
Inferior Radioulnar joint
8 carpal bones
5 metacarpals
14 phalanges


Clavicle
Supraspinous fossa
Scapula
Infraspinous fossa
Head
Greater tubercle
Humerus
Olecranon
Lateral Epicondyle
Ulna
Radius
Inferior Radioulnar joint
8 carpal bones
5 metacarpals
14 phalanges

Shoulder joint

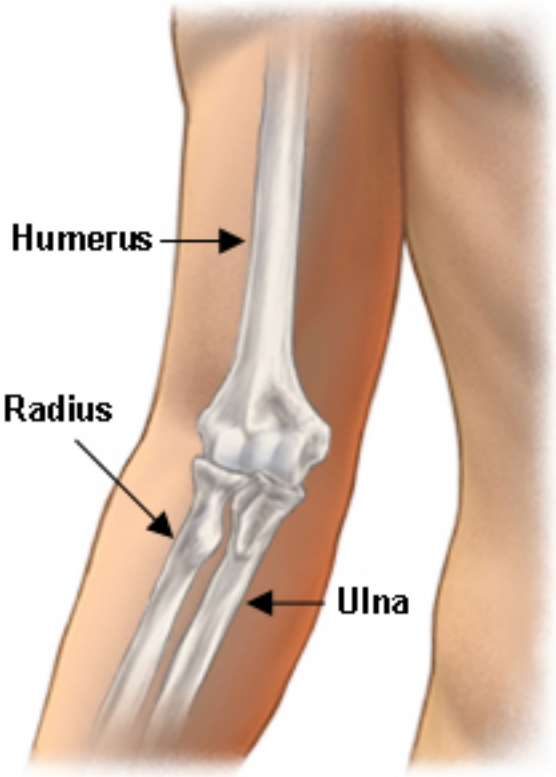
The rotator cuff muscles are a combination of the

1. Supraspinatus
2. Infraspinatus
3. Teres minor
4. Subscapularis

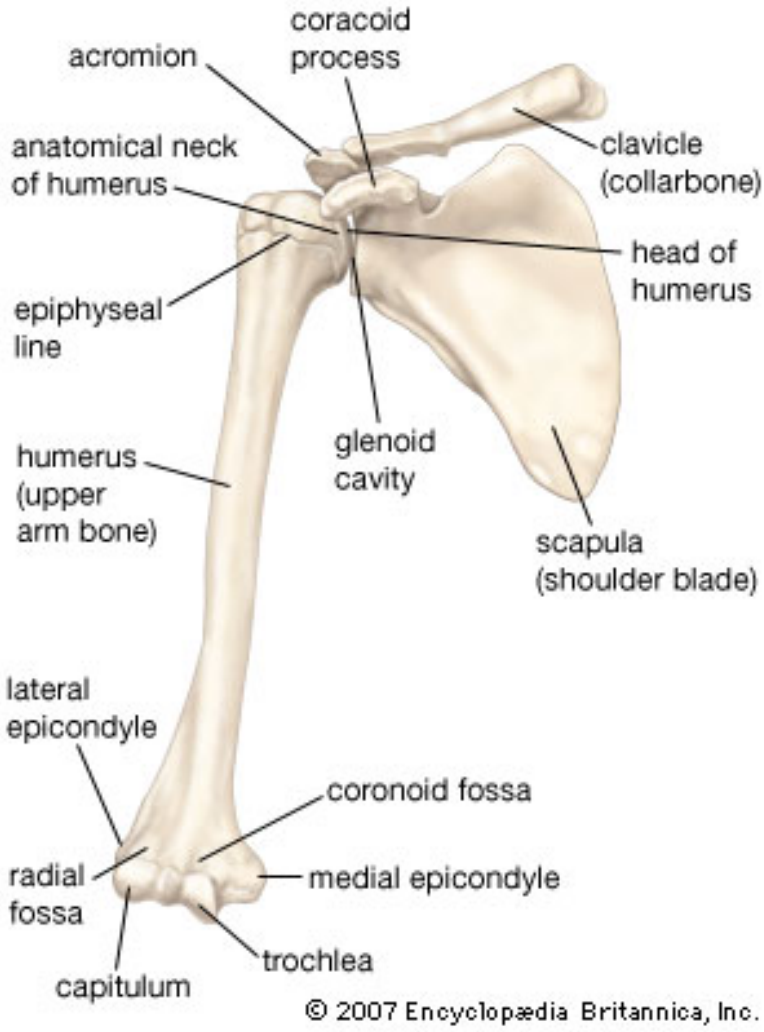
The shoulder provides a large range of movement but it has a relatively shallow socket. The ligaments around the joint are not enough to hold the joint in place.

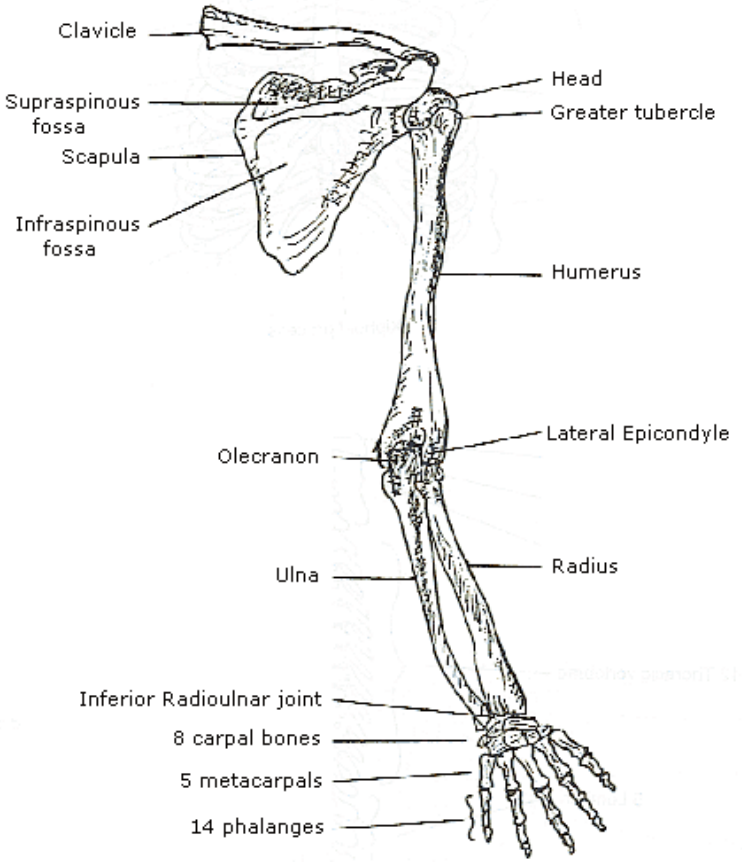
The rotator cuff muscles give the shoulder stability as it helps hold the head of the humerus in place and prevents dislocation, eg picking up a shot putt.

THE ELBOW JOINT



TYPE OF JOINT	ARTICULATING BONES	MOVEMENT	AGONIST	ANTAGONIST	SPORTING EXAMPLE

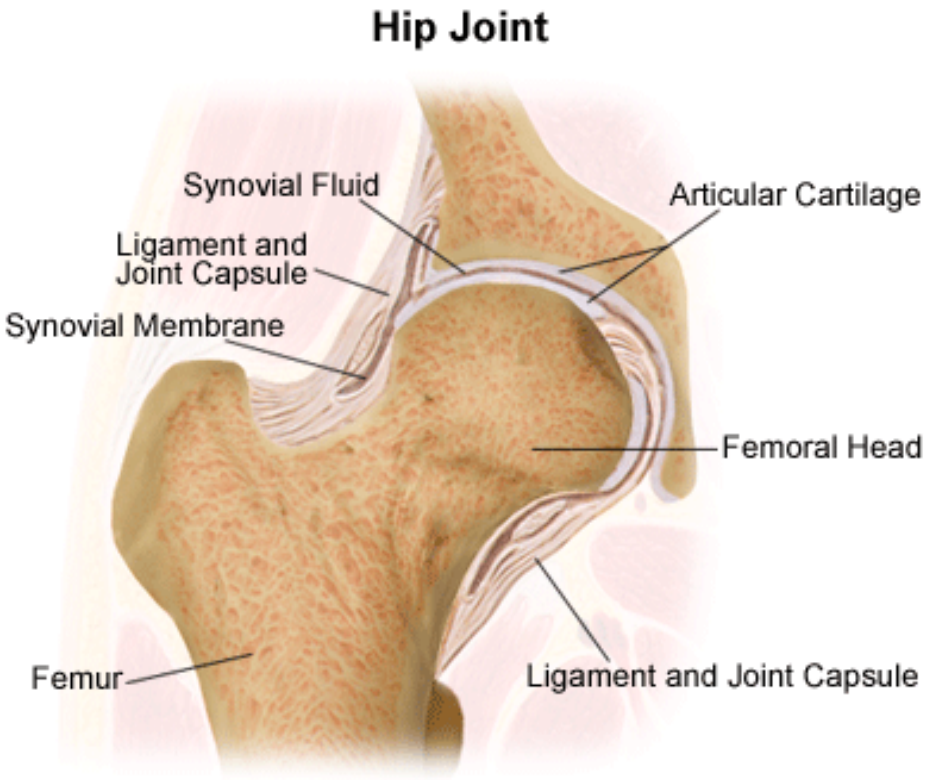

acromion
coracoid process
anatomical neck of humerus
clavicle (collarbone)
head of humerus
epiphyseal line
glenoid cavity
humerus (upper arm bone)
scapula (shoulder blade)
lateral epicondyle
coronoid fossa
radial fossa
medial epicondyle
trochlea
capitulum
© 2007 Encyclopædia Britannica, Inc.


Clavicle
Supraspinous fossa
Scapula
Infraspinous fossa
Head
Greater tubercle
Humerus
Lateral Epicondyle
Olecranon
Radius
Ulna
Inferior Radioulnar joint
8 carpal bones
5 metacarpals
14 phalanges

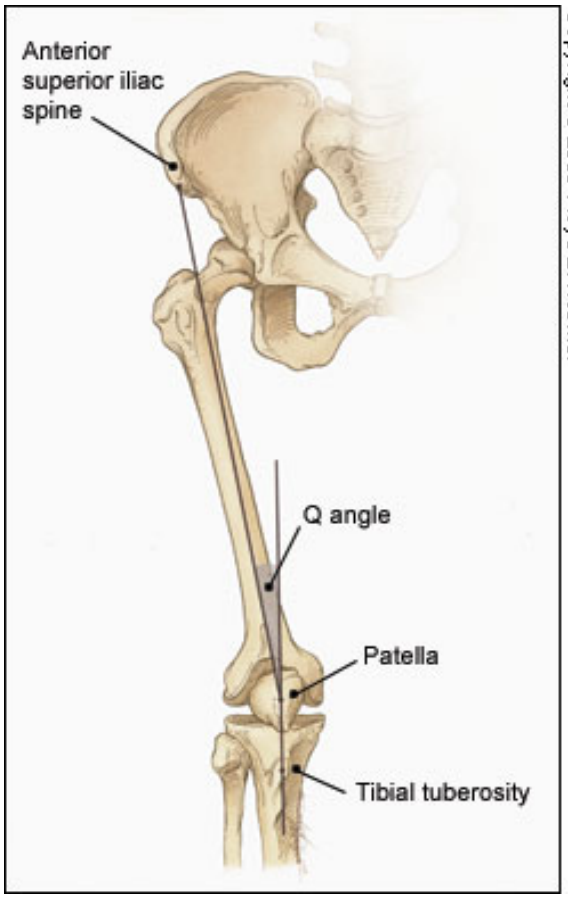
THE WRIST JOINT

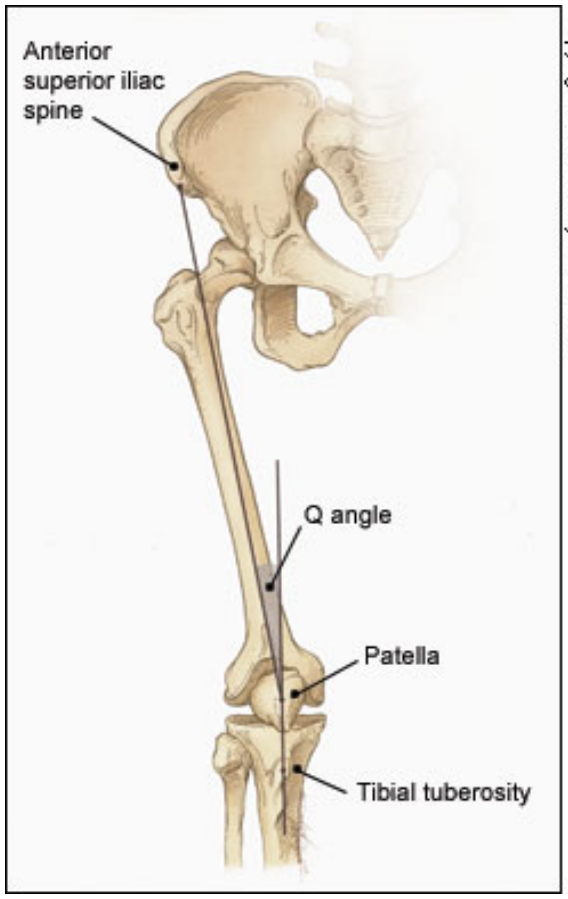
TYPE OF JOINT	ARTICULATING BONES	MOVEMENT	AGONIST	ANTAGONIST	SPORTING EXAMPLE

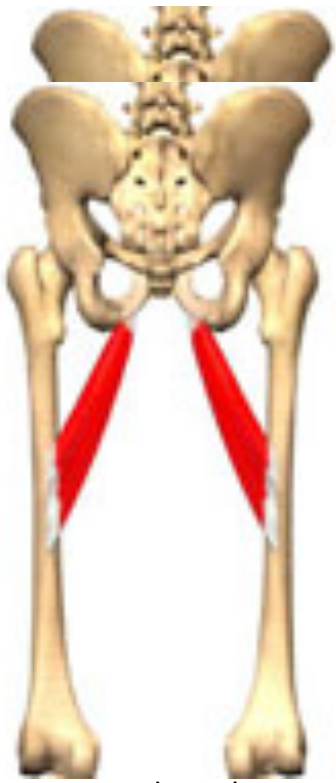
THE HIP JOINT



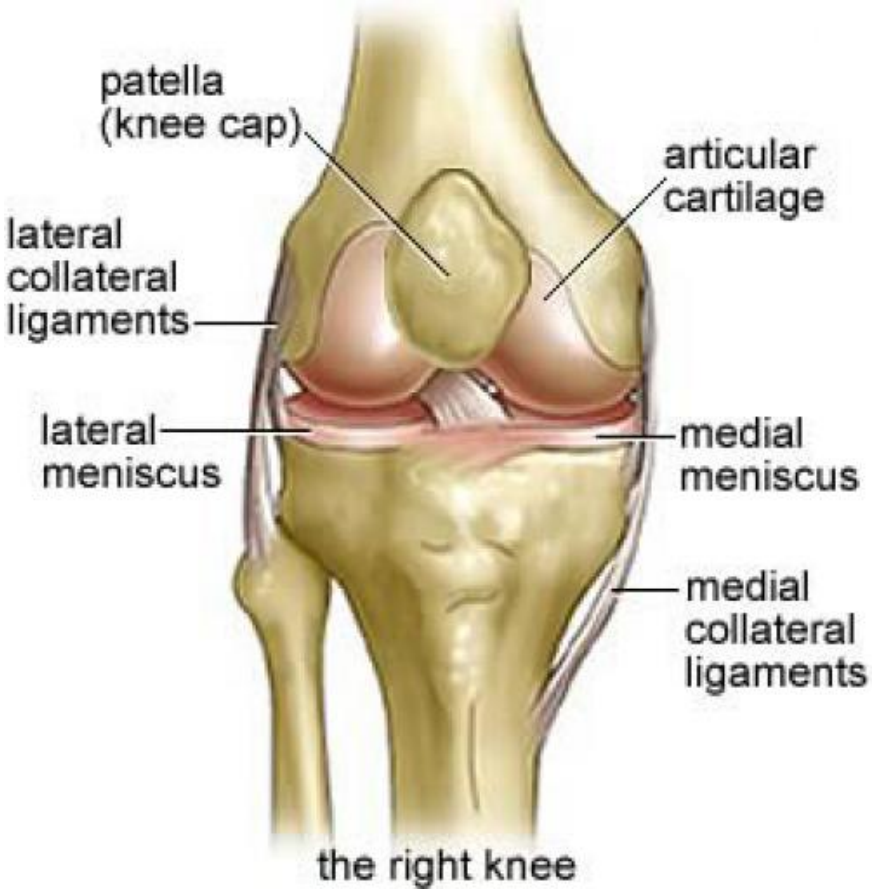
	ARTICULATING BONES	MOVEMENT	SPORTING EXAMPLE	AGONIST	ANTAGONIST


Anterior
superior iliac
spine
Q angle
Patella
Tibial tuberosity
Copyright © 2003 Floyd E. Hosmer

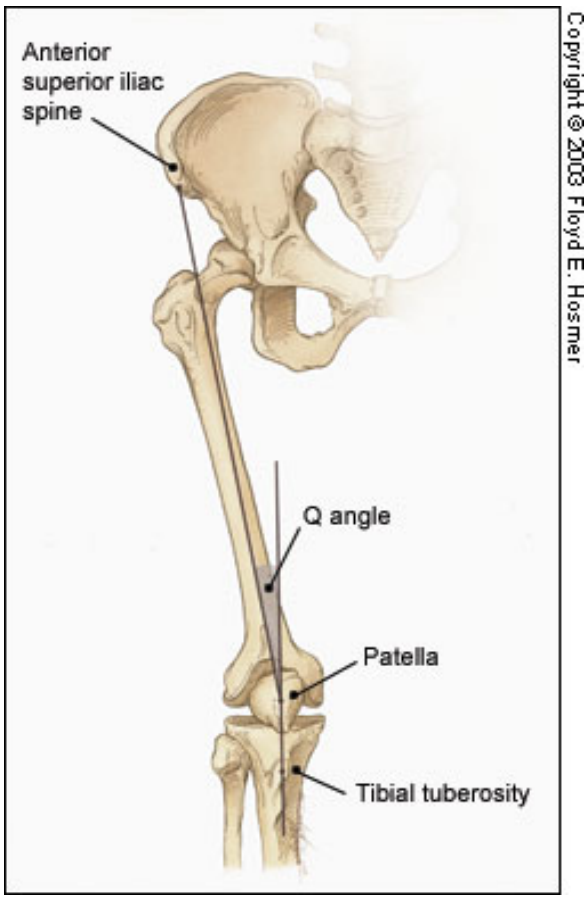

Anterior
superior iliac
spine
Q angle
Patella
Tibial tuberosity
Copyright © 2003 Floyd E. Hosmer

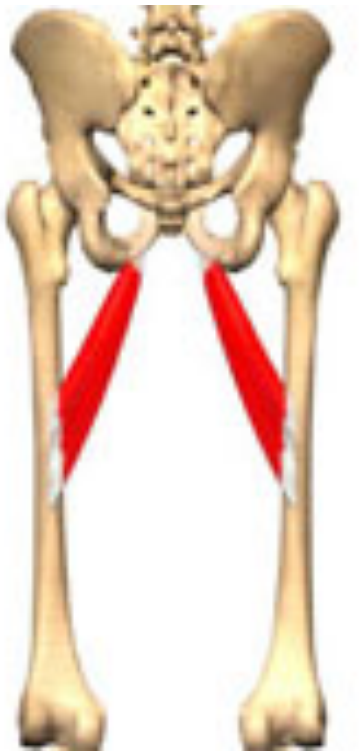


THE KNEE JOINT

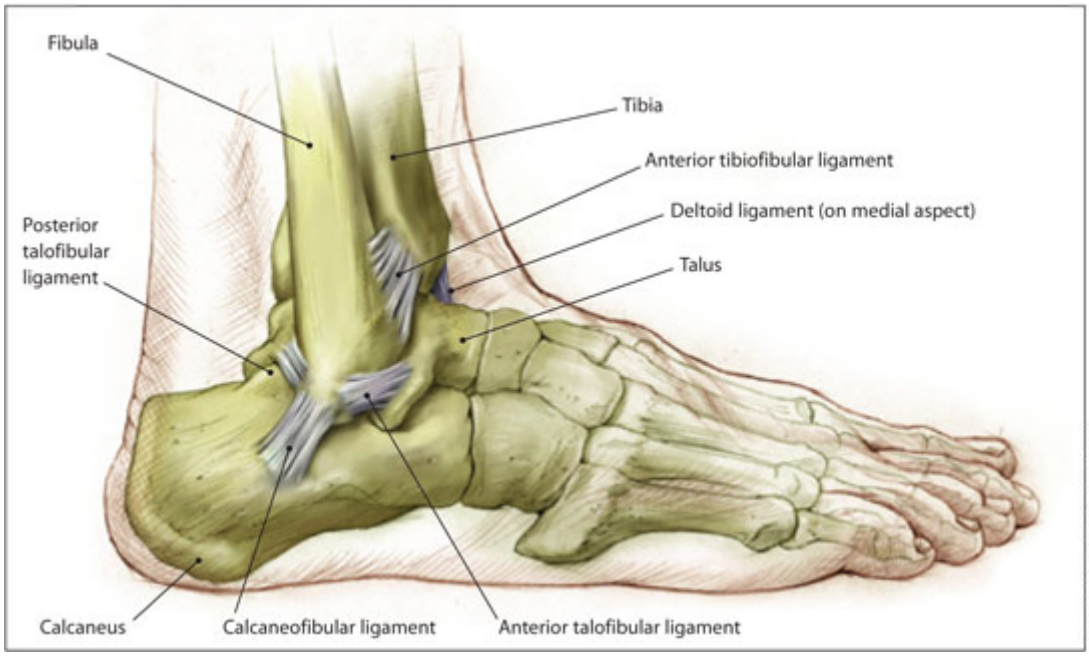


TYPE OF JOINT	ARTICULATING BONES	MOVEMENT	AGONIST	ANTAGONIST	SPORTING EXAMPLE

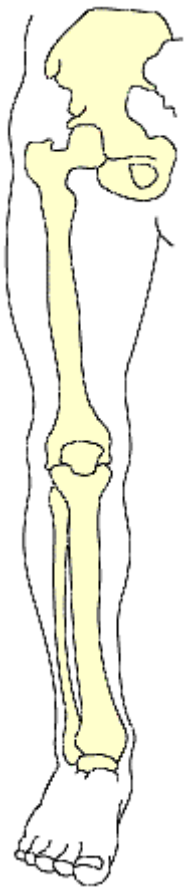

Anterior
superior iliac
spine
Q angle
Patella
Tibial tuberosity
Copyright © 2003 Floyd E. Hosmer

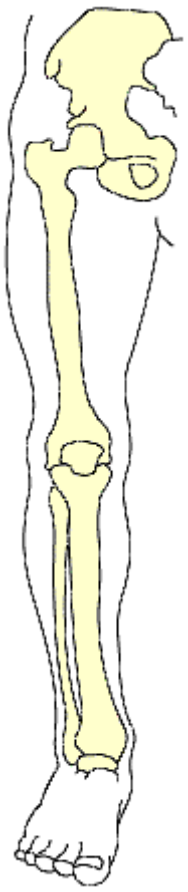


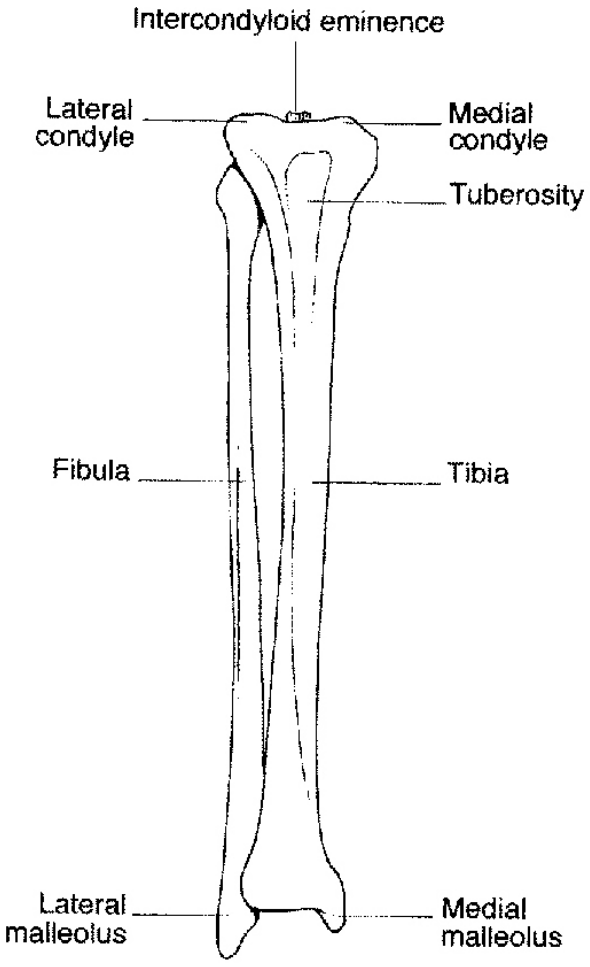
THE ANKLE JOINT

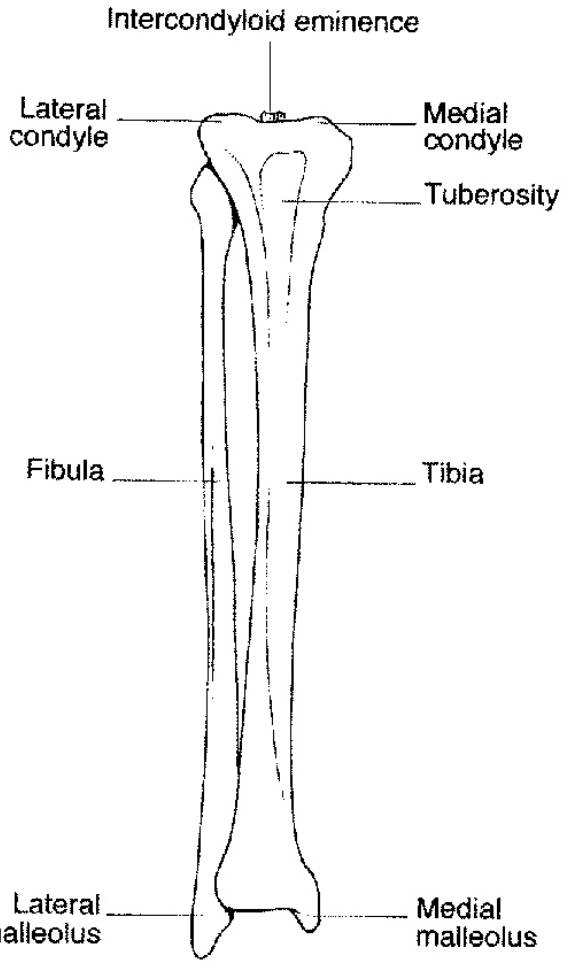


TYPE OF JOINT	ARTICULATING BONES	MOVEMENT	AGONIST	ANTAGONIST	SPORTING EXAMPLE






Intercondyloid eminence
Lateral condyle
Medial condyle
Tuberosity
Fibula
Tibia
Lateral malleolus
Medial malleolus


Intercondyloid eminence
Lateral condyle
Medial condyle
Tuberosity
Fibula
Tibia
Lateral malleolus
Medial malleolus

MUSCLE TERMINOLOGY

Functions of a muscle:

PRIME MOVER/ AGONIST – the muscle directly responsible for the movement at a joint

ANTAGONIST – the opposing muscle. As the agonist contracts the antagonist relaxes, it helps in the production of a coordinated movement.

FIXATOR – prevents unwanted movement and makes it more efficient.

ANTAGONISTIC MUSCLE ACTION – As one muscle shortens to produce the movement, another muscle lengthens to allow that movement to take place.

ORIGIN – the tendon that is attached to the bone that doesn't move.

INSERTION – the tendon of the muscle that attaches to the bone that moves. The insertion moves towards the origin during muscle contraction.

Answer **all** the questions.

1. Fig. 1 shows a person using a resistance machine to increase leg strength.

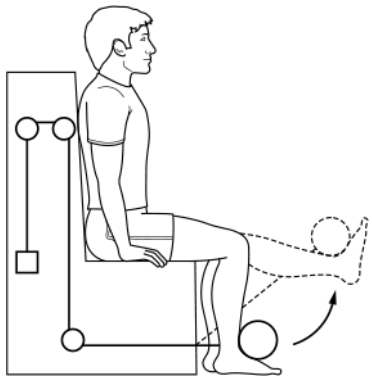


Fig. 1

Complete the table below for the knee joint moving in the direction of the arrow.

Joint	Synovial Joint Type	Movement	Agonist	Antagonist
Knee				

[4]

2. Name **one** agonist and **one** antagonist at the ankle joint at the point of take-off during a vertical jump.

[2]

3. **Fig. 6** shows the upward phase of a shoulder press.

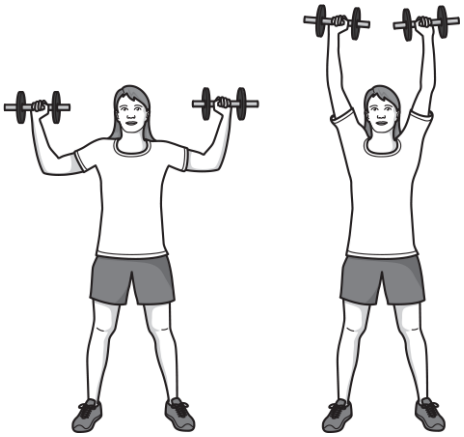


Fig. 6

Complete the table below to show the movement that takes place at the shoulder joint during the upward phase.

Movement	Agonist	Antagonist	Type of contraction

[4]

4. Fig. 1 shows an athlete performing an upright row.

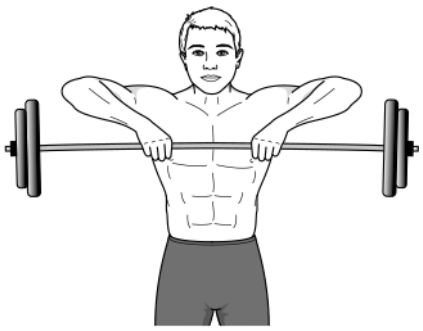


Fig. 1

i. Complete the table below for the athlete's shoulder joint whilst the bar is being raised.

Joint	Joint Type	Movement	Agonist	Antagonist	Type of Muscular Contraction
Shoulder		Abduction			

[4]

6. Fig. 1 shows a swimmer performing the front crawl.

Fig. 1

i. Complete the table below for the swimmer's ankle joint.

[3]

Joint	Joint Type	Movement	Agonist	Antagonist
Ankle		Plantar Flexion		

7. **Fig. 1** shows a performer doing a sit up.

Complete the table below to show the movements that take place at the hip joint during both the upward and downward phases.

Phase	Agonist	Movement produced	Type of contraction
Upward			
Downward			

[6]

END OF QUESTION PAPER