Types of Joints: (Synovial / fibrous / Cartilagenous)

1→ Synovial Joints (6 types)

All synovial joints share the following:

- Synovial cavity containing synovial fluid
- Articular capsule with synovial membrane
- Hyaline articular cartilage which acts as a Teflon coating over the bone surface, allowing the articulating bones to move smoothly against each other without damaging the underlying bone tissue.

1 ⇒ Plane synovial joints: These joints allow for short non-axial gliding movements. This is due to the fact that the articular surfaces are flat. These joints are multiaxial

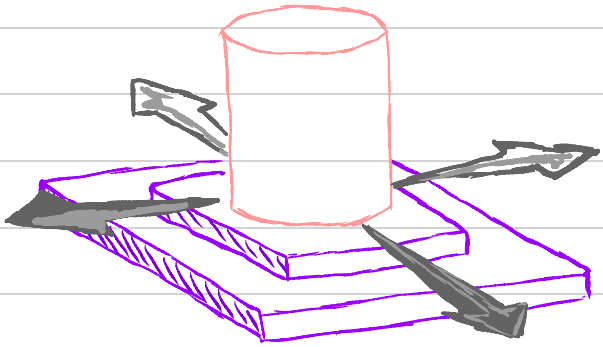
flat articular surface ⇒ most likely a plane synovial joint.

Examples:

* Intercarpal Joint ⇒ Joints between the carpal bones. These joints allow for gliding motion in one plane. Same deal with intertarsal joints in the foot

* Sacroiliac Joint ⇒ this joint is between the flat auricular surface on the medial side of the ilium and the sacrum. Since its a flat surface, its a plane synovial joint. It allows gliding motion and since its strong due to interlocking of the two bones it supports the weight of the upper body and plays a role in weight transmission.

Illustration:



Gliding motion in one plane.

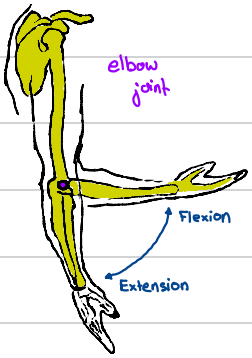
2 => Hinge Synovial Joint: This uniaxial joint is composed of a cylindrical end of one bone and a moon crest shape (a groove shape) of another bone. Hinge joints are in one plane and they allow for **extension** and **flexion** only

↳ arm/leg fully extended and straight

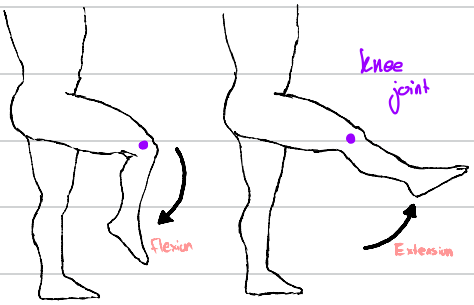
↳ "Flexing" bicep muscle. 90° angle

Examples:

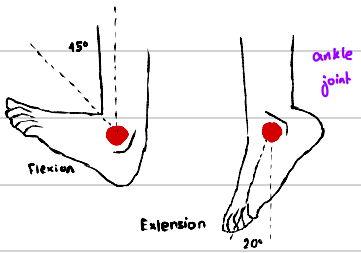
* Elbow Joint



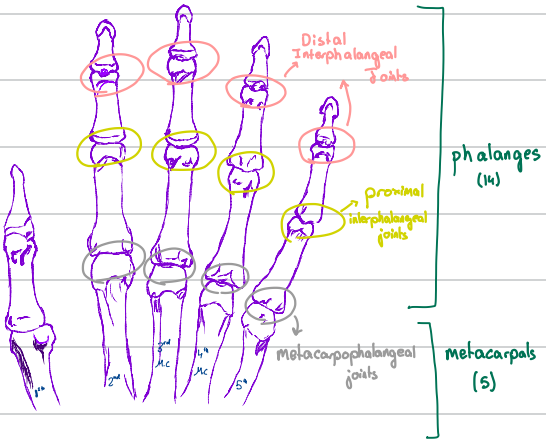
* Knee Joint



* Angle Joint



* Distal and proximal interphalangeal joints



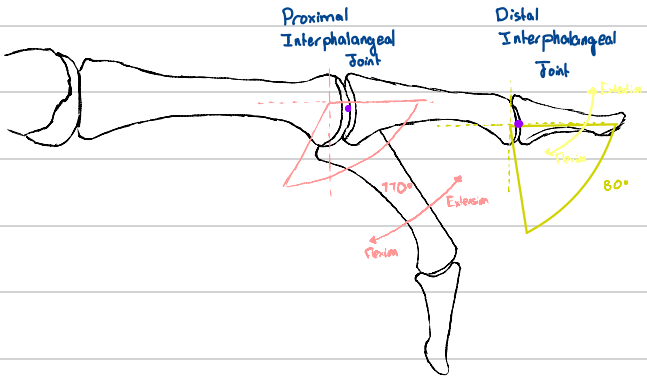


Illustration :

→ Like a doorknob or a door hinge, they only allow 90° angle movement

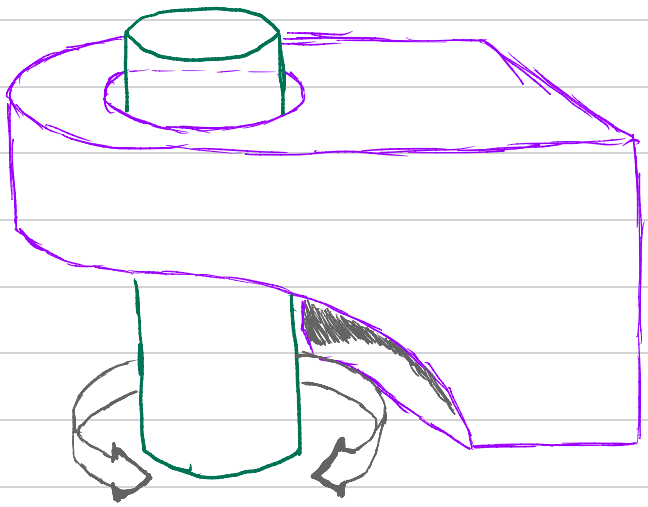
3 => Pivot Synovial Joint : Cylindrical bone rotates inside another ring-shaped bone. Only permits uniaxial rotation of one bone around its own axis.

Examples:

* Proximal Radioulnar Joint => Head of the radius rotates within the ring-like radial notch of the ulna. This joint allows the hand to be pronated & supinated

* Atlantoaxial Joint => Formed by the top two vertebrae of the neck. Allows movement of the head from side to side, such as saying "no".

Illustration:

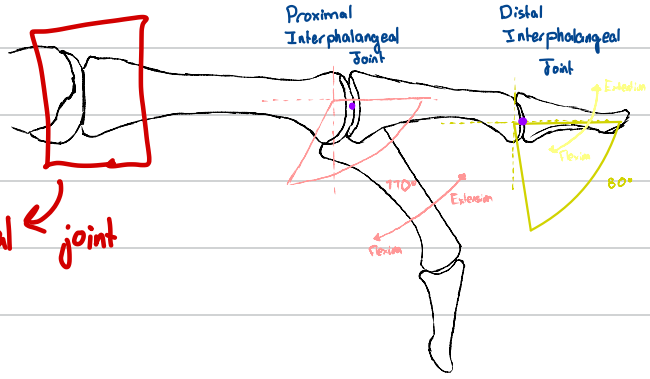


4 => Condyloid Synovial Joint : An oval shaped bone fits into a complementary depression of another bone. This biaxial joint allows all angular motion such as flexion & extension & abduction & adduction & circumduction (movement in circular pattern). You can find circumduction in condyloid joints & ball & socket joints. Note that condyloid joint does not allow for full rotation like ball and socket joint. You can find these joints where we use up & down, side to side and circular motion. Such as the jaw, wrist, toes, and knuckles.

Examples:

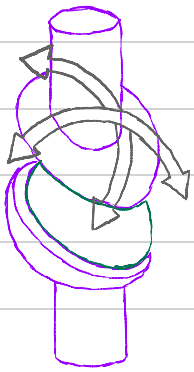
* Radiocarpal Joint => Articulation between distal radius and the carpal bones scaphoid & lunate & triquetrum. This joint allows for proper hand movement.

* Metacarpophalangeal Joint (knuckles) & metatarsophalangeal joints : These joints allow for the movement of the fingers in many directions.



metacarpophalangeal joint

Illustration:



-> Looks very similar to ball & socket but is more restricted

5 => Saddle Synovial Joints: Similiar to condylar joints but allow greater freedom of movement. It has both concave & convex surfaces that articulate with each other. Concave to convex surfaces. Thus it looks like a saddle. Example is the thumb-to-palm joint

Examples:

* Carpometacarpal Joint of the thumb => Joint between trapezium carpal bone and the first metacarpal (thumb). This allows the thumb to have freedom of movement.

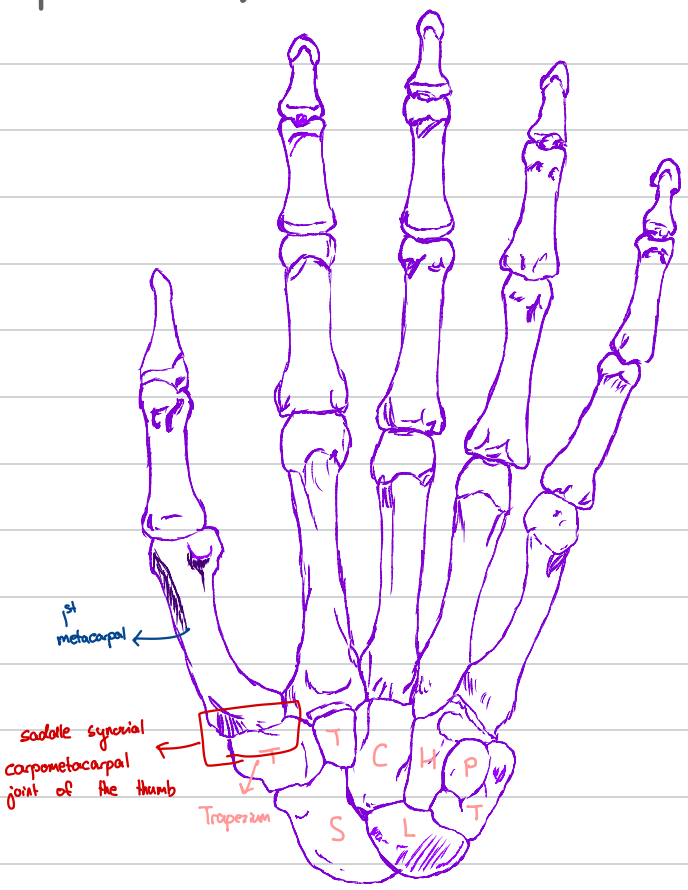
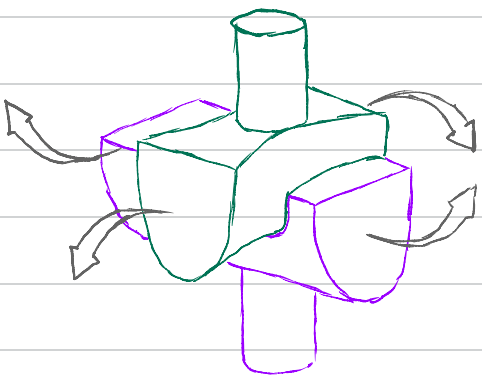


Illustration:



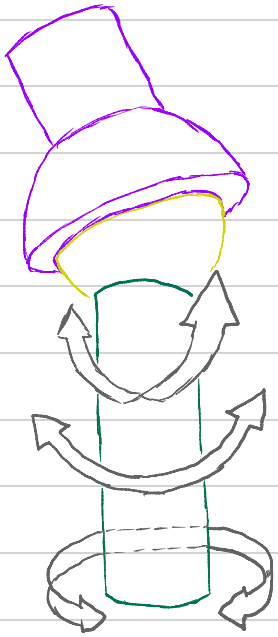
6=> Ball and Socket synovial joint : The spherical head of one bone articulates with the cup-like socket of another bone. This joint is the most mobile and allows for 360° movement. Only two examples.

Examples:

* Glenohumeral Joint (shoulder joint) => Articulation of the humerus head (ball) with the glenoid fossa (socket) which is present on the lateral side of the scapula.

* Hip joint => Articulation of the femoral head (ball) with the acetabulum (socket)

Illustration:



Joints in the hand:

1→ Plane synovial => gliding motion => intercarpal joints

2→ Hinge synovial => flexion & extension => proximal & distal interphlangeal joints

3→ Condyloid synovial => flexion + extension + adduction + abduction + circumduction

=> metacarpal phalangeal joint + radiocarpal joint

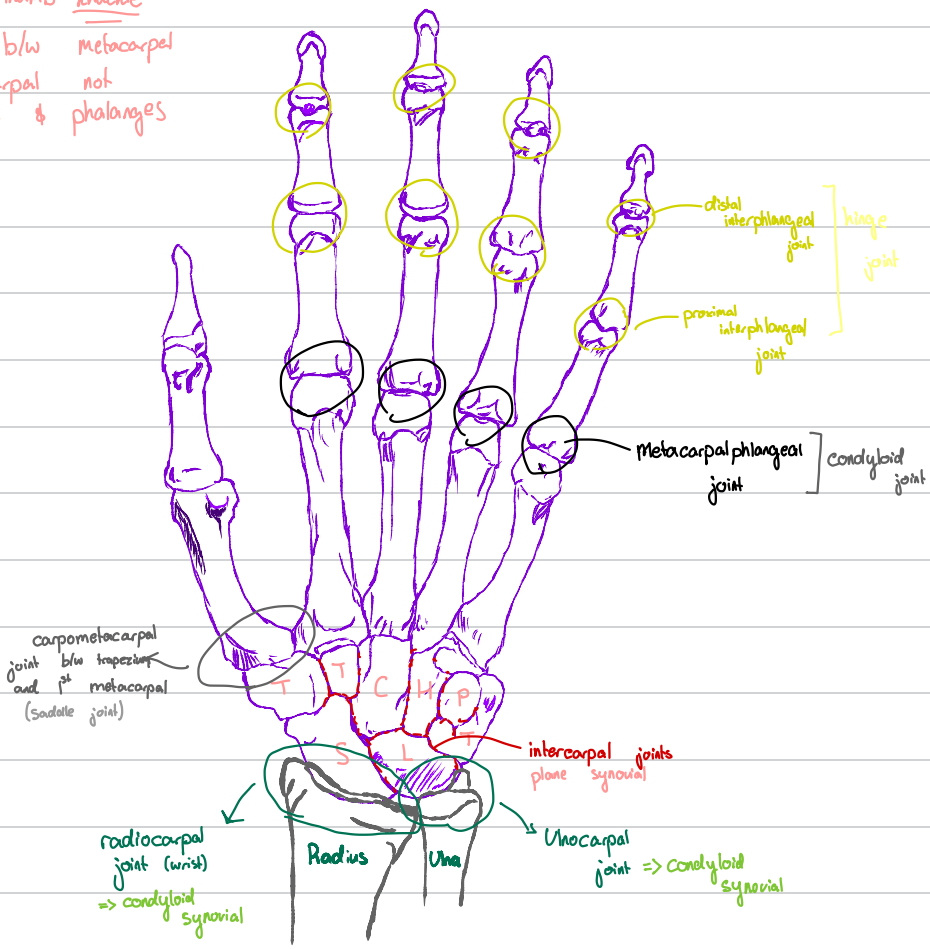
↳ knuckles ↳ wrist

4→ Saddle synovial => flexion + extension + adduction + abduction + circumduction

=> carpometacarpal joint between trapezium carpal and first metacarpal (thumb)

↳ NOT thumb knuckle

It is b/w metacarpal and carpal not metacarpal & phalanges



2 -> Fibrous Joints

These joints are held together by dense connective tissue.

The bones dont have a joint cavity.

These joints are IMMOVABLE

Example of fibrous joints is the cranial structure between bones of the skull.

3 -> Cartilaginous Joints

These joints are entirely joined by cartilage. They are slightly movable, having more movement than fibrous but less than synovial.

Examples include the pubic symphysis.