

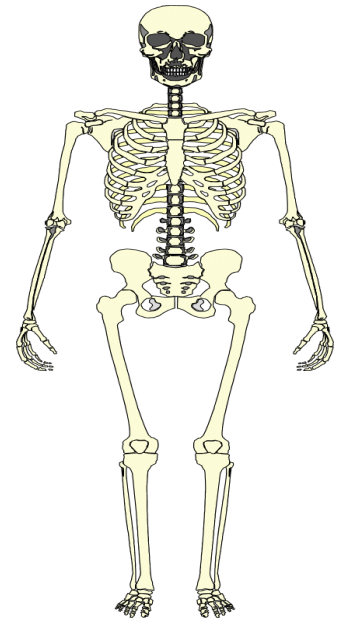
# The Skeleton: The Types of Joints and movement

# Lets put the bones into the four categories

Long Bones	Short Bones	Flat Bones	Irregular Bones
Femur	Tarsals	Patella	Atlas
Humerus	Carpals	Cranium	Axis
Tibia		Pelvis (Ilium)	Cervical
Radius		Scapula	Thoracic
Ulna		Sternum	Lumbar
Fibula		Ribs	Sacrum
Phalanges			Coccyx
Meta Tarsals			
Meta Carpals			
Clavicle			

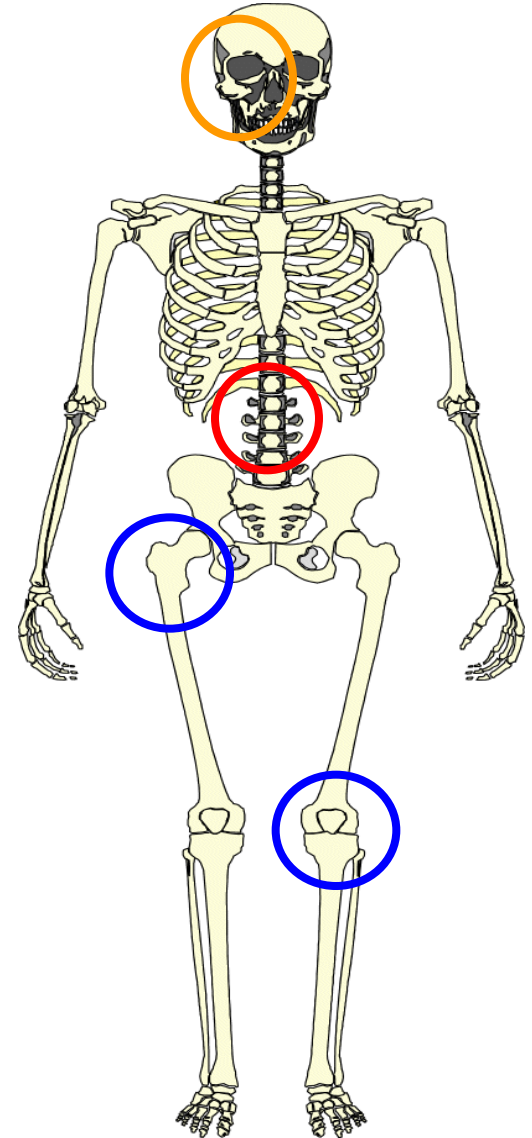
# Aims of the Lesson

- Within this lesson you will develop your knowledge and understanding of:
  - The three classifications of joints
  - The six types of synovial joints
  - The types of body movements



# Types of Joints

- **Immovable or fixed joints (Fibrous)**
  - These joints are held together by tough tissue which develops during childhood.
  - Examples include: the Cranium, pelvis and vertebrae
- **Slightly moveable joints (Cartilaginous)**
  - Here, movement is needed but only to a certain point e.g the vertebral column
  - Individual vertebrae are separated by cartilage
- **Freely moveable joints (Synovial)**
  - These joints are also called synovial and allow movement to take place.
  - There are 6 types of freely moveable or synovial joints

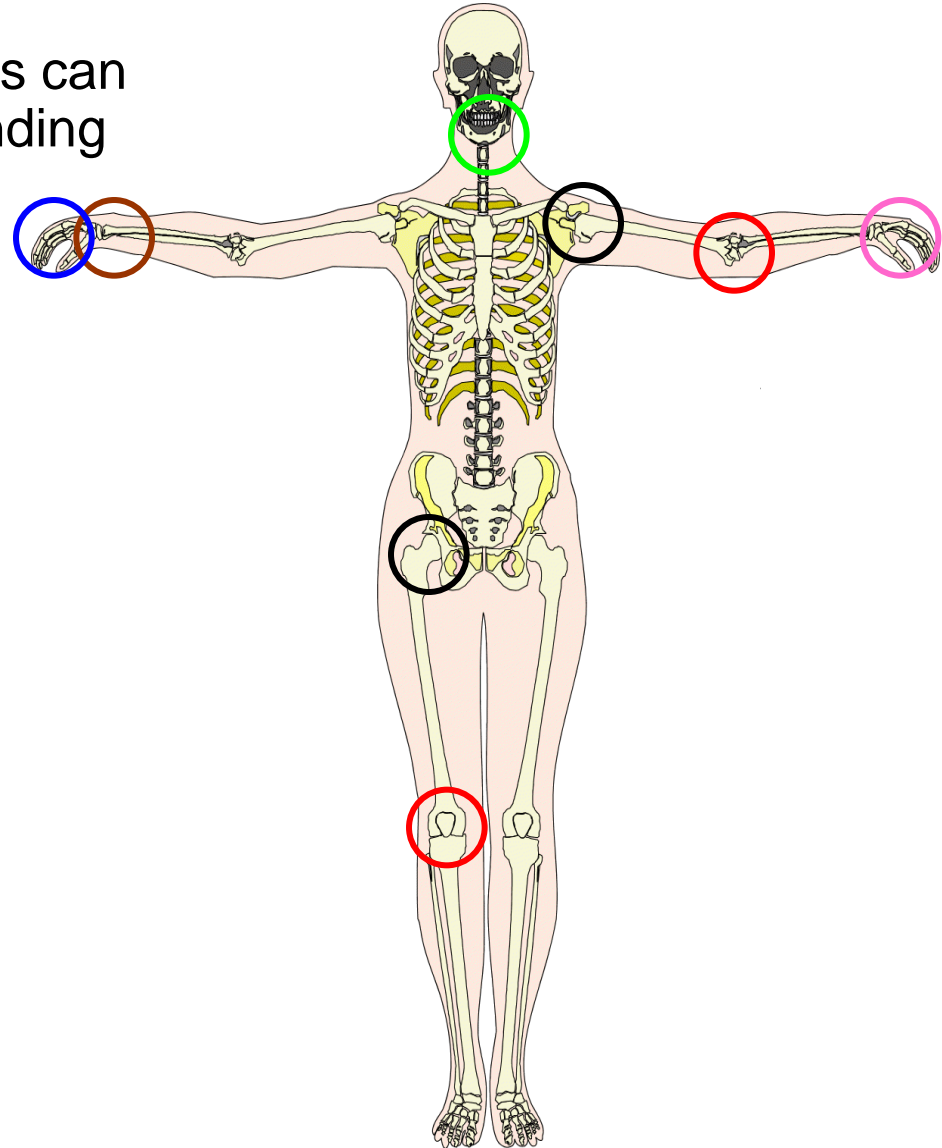


# Types of Synovial Joints

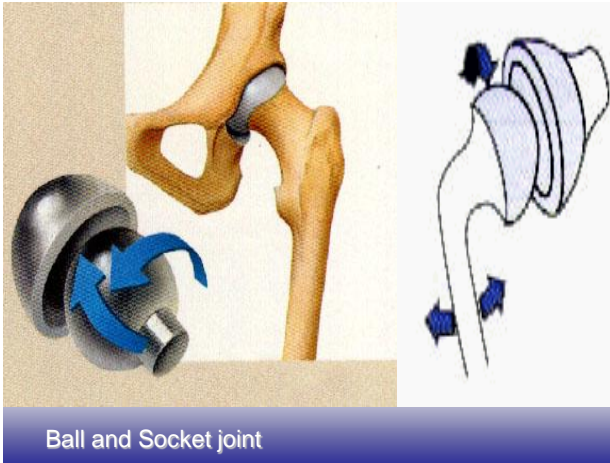
- Freely Moveable (Synovial) joints can be divided into six groups depending upon the way they move.

Key:

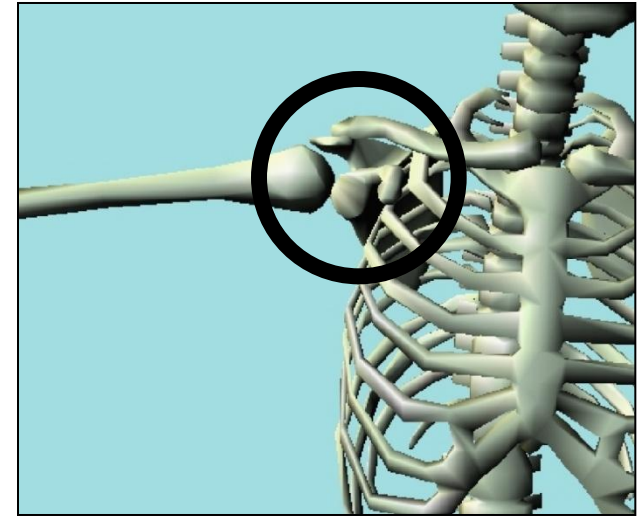
- Ball and Socket Joint
- Hinge Joint
- Pivot Joint
- Gliding Joint
- Saddle Joint
- Condylloid Joint



# Ball and Socket Joints



- Of all the joints in the body, the **BALL AND SOCKET JOINT** allows the greatest range of movement
- In this type of joint, one end of the bone is shaped like a ball, and it fits into a hollow socket at the end of another joint.
- Held together by ligaments and tendons



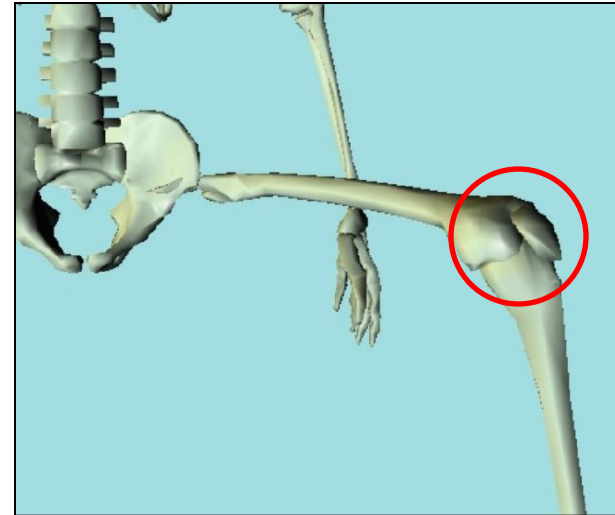
Two main Ball and Socket Joints:  
Shoulder and hip joints



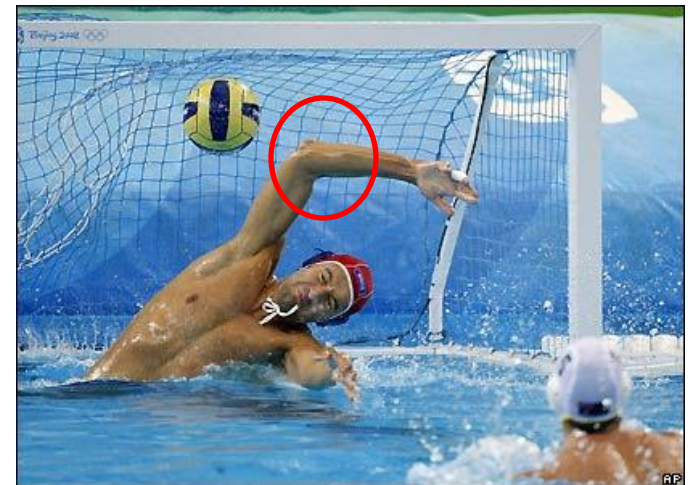
# Hinge Joints



- **HINGE JOINTS** allow extensive flexion and extension (Bending and straightening) with only a small amount of rotation.
- The joint is made by the joining of two bone ends which have smooth surfaces. They are shaped to move against each other with minimum friction.
- Strong ligaments stop the bones from sliding off from one side to the other.

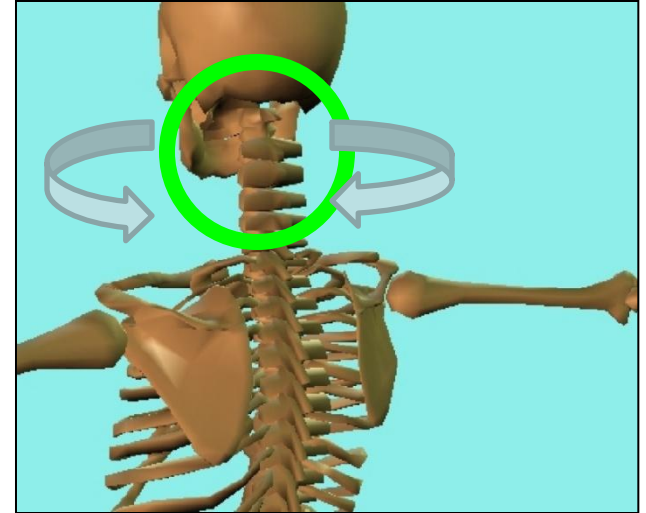


Examples of Hinge Joints:  
Elbow and Knee Joints



# Pivot Joint

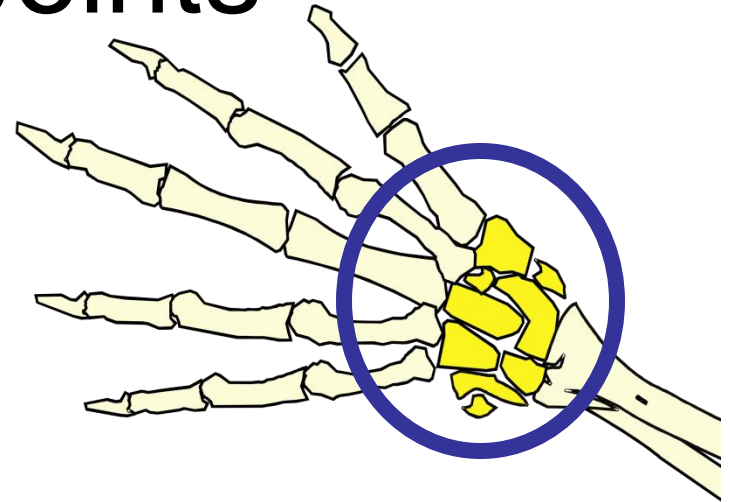
- PIVOT JOINTS allow only rotation.
- The joint works by the end of one bone having a “peg” which fits into a “ring” formed by the other bone.
- There is a pivot joint at the top of the spinal column, between the axis and atlas bones of the neck. This allows us to turn, raise and lower our heads – this is crucial in controlling balance and maintaining awareness.





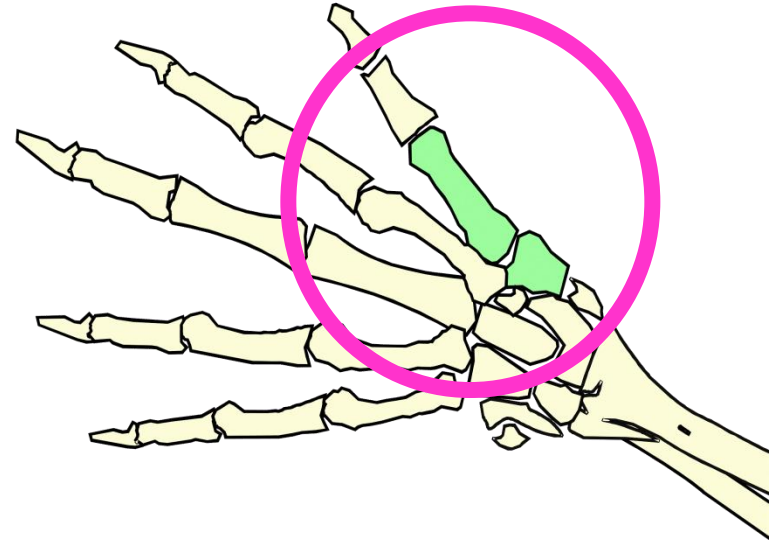
# Gliding Joints

- **GLIDING JOINTS** allow flexion and extension through a slight gliding motion between the ends of small bones such as hands and feet.
- These small bones can move over one another to increase the flexibility of the hands and feet.
- Strong ligaments link them together and stop them moving to far.



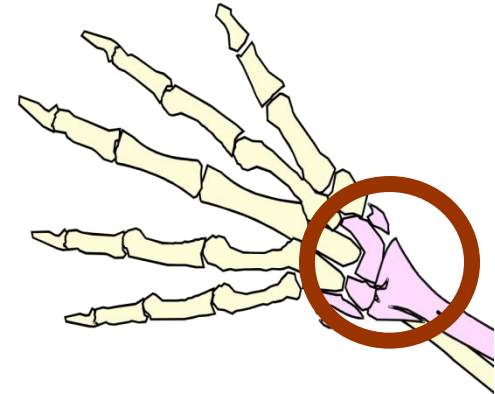
# Saddle Joints

- SADDLE JOINTS occur where concave and convex surfaces meet.
- The saddle joints allow the movement of the joint forward and backwards, and right to left.
- Examples of saddle joints include the fingers and thumbs.



# Condyloid Joints

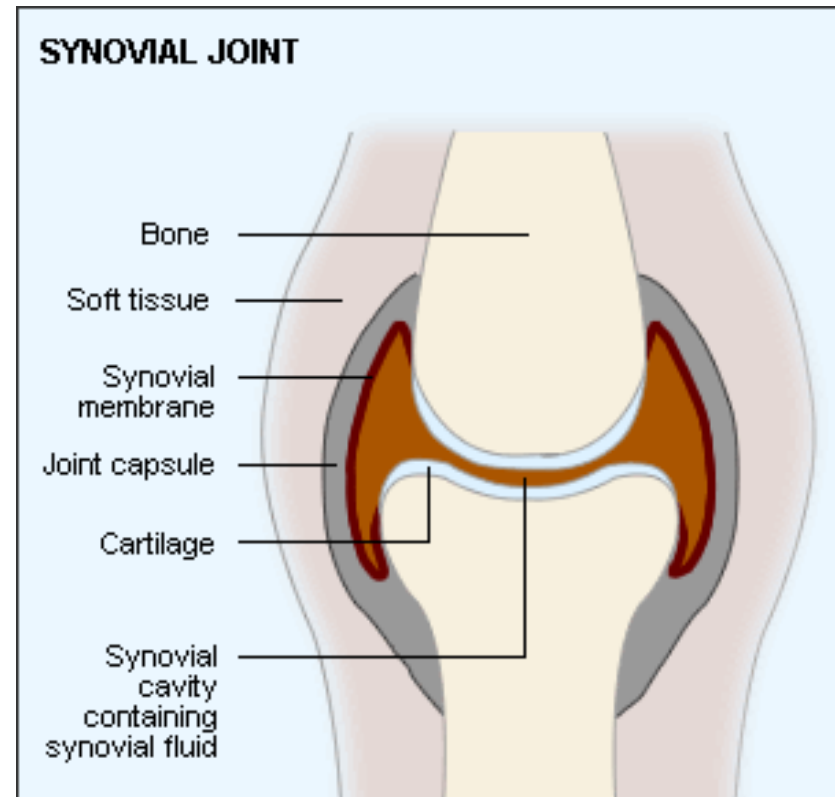
- Within the CONDYLOID JOINT the full convex shape of one bone end, fits into the full concave shape of an adjoining bone.
- This allows for movement in all directions, however full rotations.
- The main example of the Condyloid joint is the wrist.



# Why are they called Synovial Joints?

They all have some thing called **Synovial Fluid** in them.

- This lubricates the joint, like oil in a working engine. It enables all parts of the joint to move against each other smoothly.
- This is inside the **synovial (joint) capsule** which holds the fluid in place.
- The **synovial membrane** lies inside the capsule where the fluid is produced.



# Connective Tissues

- There are three types of connective tissues used within the joints.
- Cartilage
  - Cartilage forms a cushion between bones in order to stop them rubbing
- Ligaments
  - Ligaments are like very strong string that holds bones together
- Tendons
  - Tendons attach muscles to bones (or to other muscles)

# What's the difference?

Cartilage	Tendons	Ligaments
Tough	Attaches bone to muscle	Attaches bone to bone
Flexible	Sturdy	Elastic
At end of bone	Non elastic	Stabilise
Cushions	Size changes depending on muscle	Made of many fibres
	Anchor	Strong

# Types of Joint Movement

- There are six different kinds of movement the joints can allow
- These are:
  - Extension
  - Flexion
  - Abduction
  - Adduction
  - Circumduction
  - Rotation



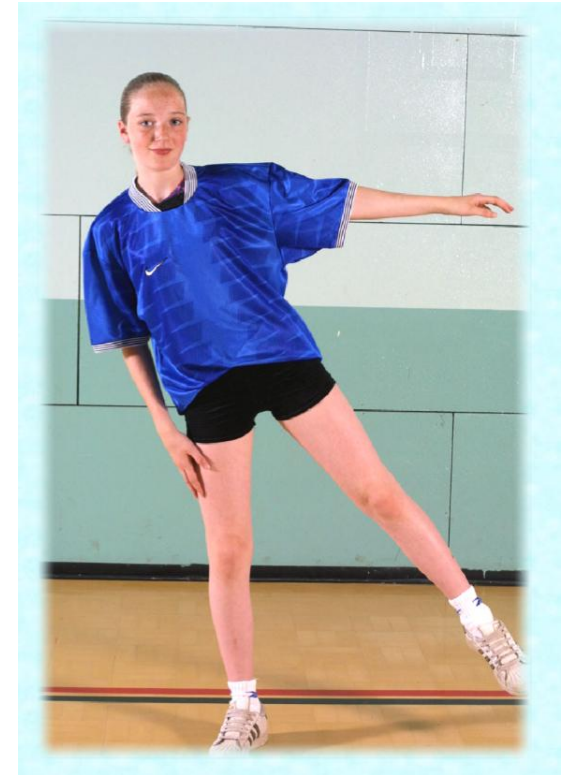
**Extension:**  
straightening or  
extending a limb.  
(Opening a Joint)



**Flexion:** Bending  
or flexing a limb.  
(Closing a joint)



**Abduction:** Moving  
a limb away from  
the centre line of  
the body.





**Rotation:** This is a turning or rotational movement of a limb or body part.

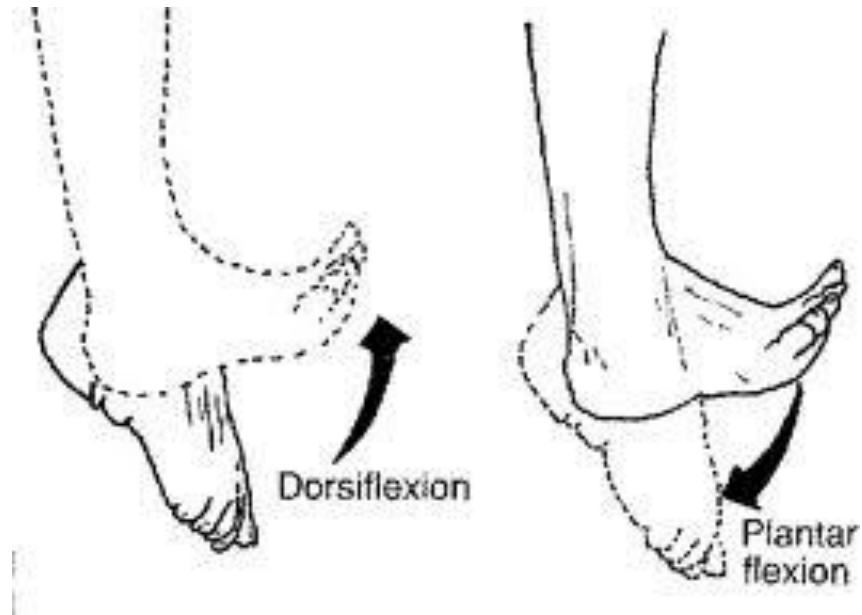


**Circumduction:**  
The ability of a limb to be moved in circles.



**Adduction:**  
moving a limb towards the centre line of the body



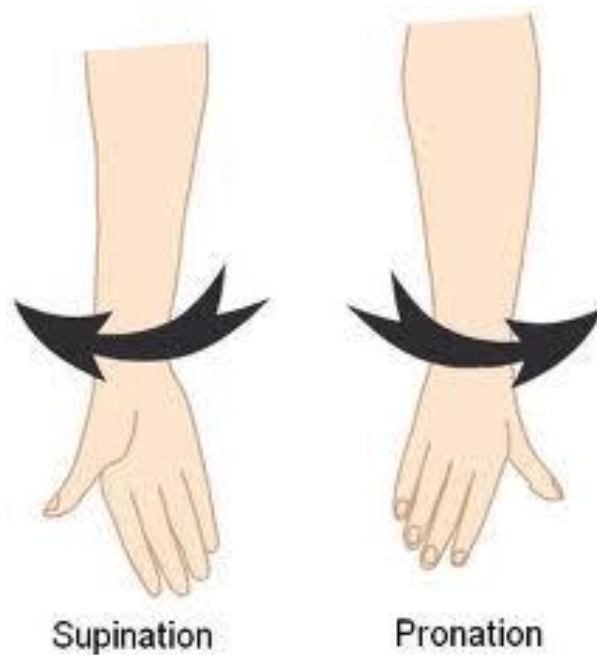


**Plantarflexion** (or **plantar flexion**)

Is the movement which increases the approximate 90 degree angle between the front part of the foot and the shin, as when pressing down on a car pedal

**Dorsiflexion** is the movement which

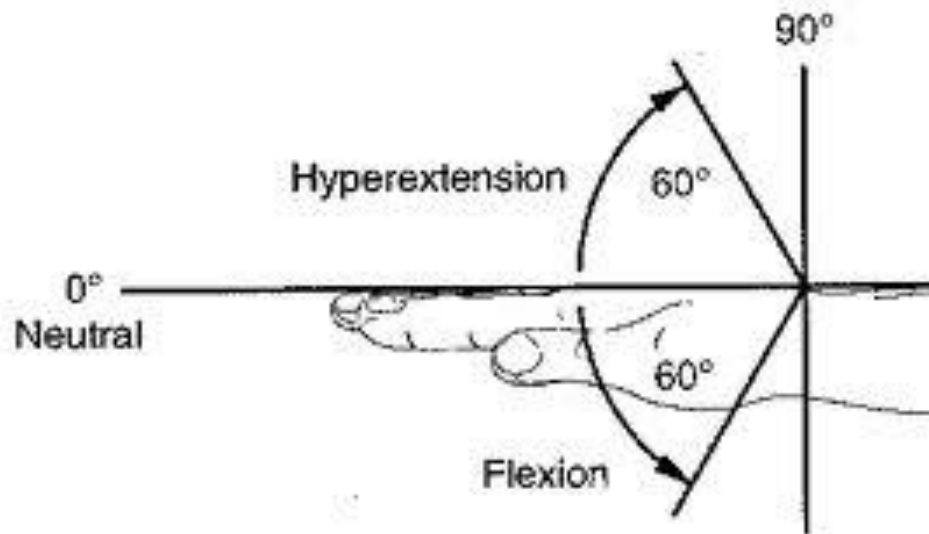
decreases the angle between the dorsum (superior surface) of the foot and the leg, so that the toes are brought closer to the shin. The movement moving in opposite directions is called plantarflexion. Put more simply: it applies to the upward movement of the foot at the ankle joint



**Pronation** – A rotation of the forearm that moves the palm from an anterior-facing position to a posterior-facing position, or palm facing down. This is not medial rotation as this must be performed when the arm is half flexed

**Supination** – The opposite of pronation, the rotation of the forearm so that the palm faces anteriorly, or palm facing up. The hand is **supine** (facing anteriorly) in the anatomical position

Hyperextension - Movement at a joint to a position beyond the joint's normal maximum extension





**The knee (HINGE JOINT) is used when flexing (bending) and extending (straightening) the leg to kick a football**