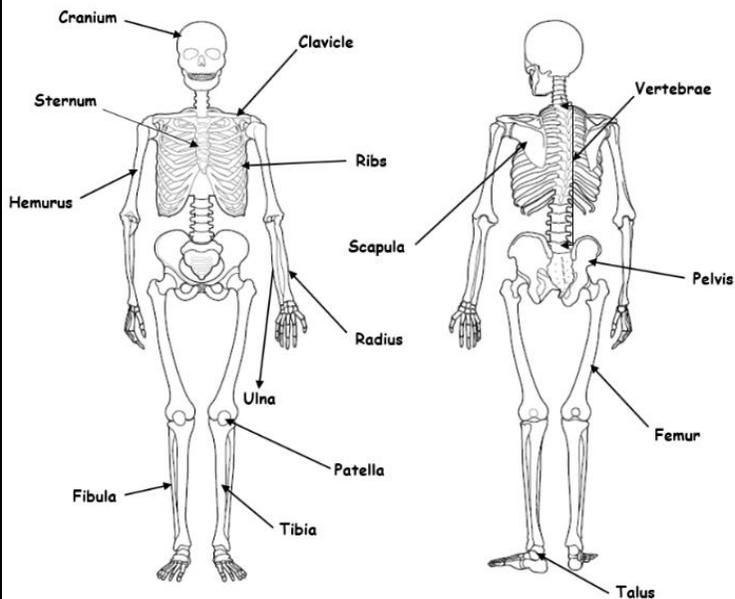


# Paper 1: The structure and functions of the musculoskeletal system (part 1)

## Bones of the skeleton:



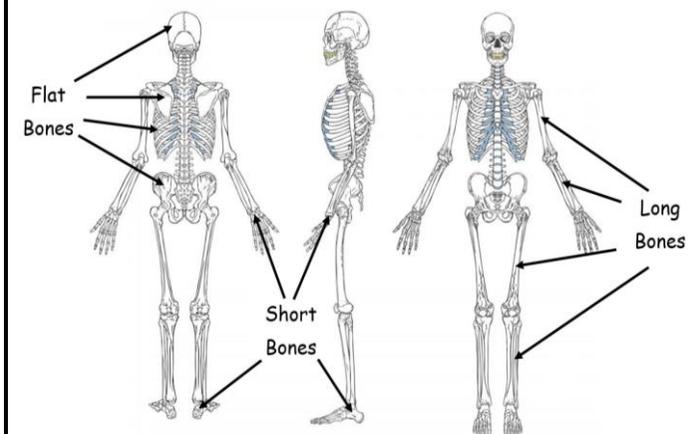
## The functions of the skeleton:

- 1. Protection of vital organs**  
Cranium protects the brain when heading
- 2. Structural shape & muscle attachment**  
Your skeleton provides **support** by providing a structural shape for muscles and tissues to attach
- 3. Formation of joints for movement**  
Bones provide anchors for muscles to attach. Tendons attach muscle to bones. Muscles pull on bones to create movement
- 4. Blood cell production**  
Red blood cells carry oxygen. White blood cells fight infection. Platelets clot blood
- 5. Store of minerals**  
Calcium and Phosphorus is stored in the bones to keep them strong



## Structure of the skeleton:

Bones are classified by their shape each type of bone has a function.

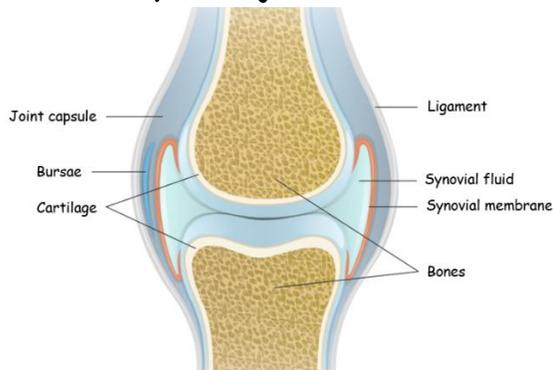


**Flat bones:** They are longer than they are wide. They enable gross movements by working as levers e.g. the humerus, tibia and ulna.

**Short bones:** They are as wide as they are long. In sport they allow finer controlled movements e.g. the tarsals (ankle) and carpals (wrist).

**Flat bones:** Flat bones usually protect organs or offer a broad surface for muscles to attach to. Flat bones protect us in sporting situations, e.g. the ribs protect our internal organs when getting tackled in rugby

## Structure of a synovial joint:



- Synovial fluid:** Lubricates and reduces friction of the joint it supplies nutrients and removes waste products
- Synovial membrane:** Contains and releases synovial fluid
- Articular cartilage:** Prevent bones from rubbing and acts as a shock absorber
- Joint capsule:** Surrounds the synovial joint it protects and stabilises the joint
- Ligament:** Joins bone to bone, helps stabilise the joint
- Bursae:** Fluid filled sacs that provides a cushion between the tendons and bones reducing friction

## Types of freely movable joints:



**Hinge joint:** Found at the elbow and knee and ankle, allows flexion and extension



**Ball and socket joint:** Found at the hip and shoulder, allows flexion, extension, abduction, adduction, rotation & circumduction

## Movement possibilities at joints:

- Flexion:** bending movement (decreases angle)
- Extension:** Straightening movement (increase angle)
- Abduction:** Moving away from midline
- Adduction:** Moving towards the midline
- Plantar flexion:** Pointing the toes downwards
- Dorsi flexion:** Pointing the toes upwards
- Rotation:** Rotation around a joint or axis
- Circumduction:** Movement in the shape of a cone, flexion/extension abduction/adduction

