

Skeletal System

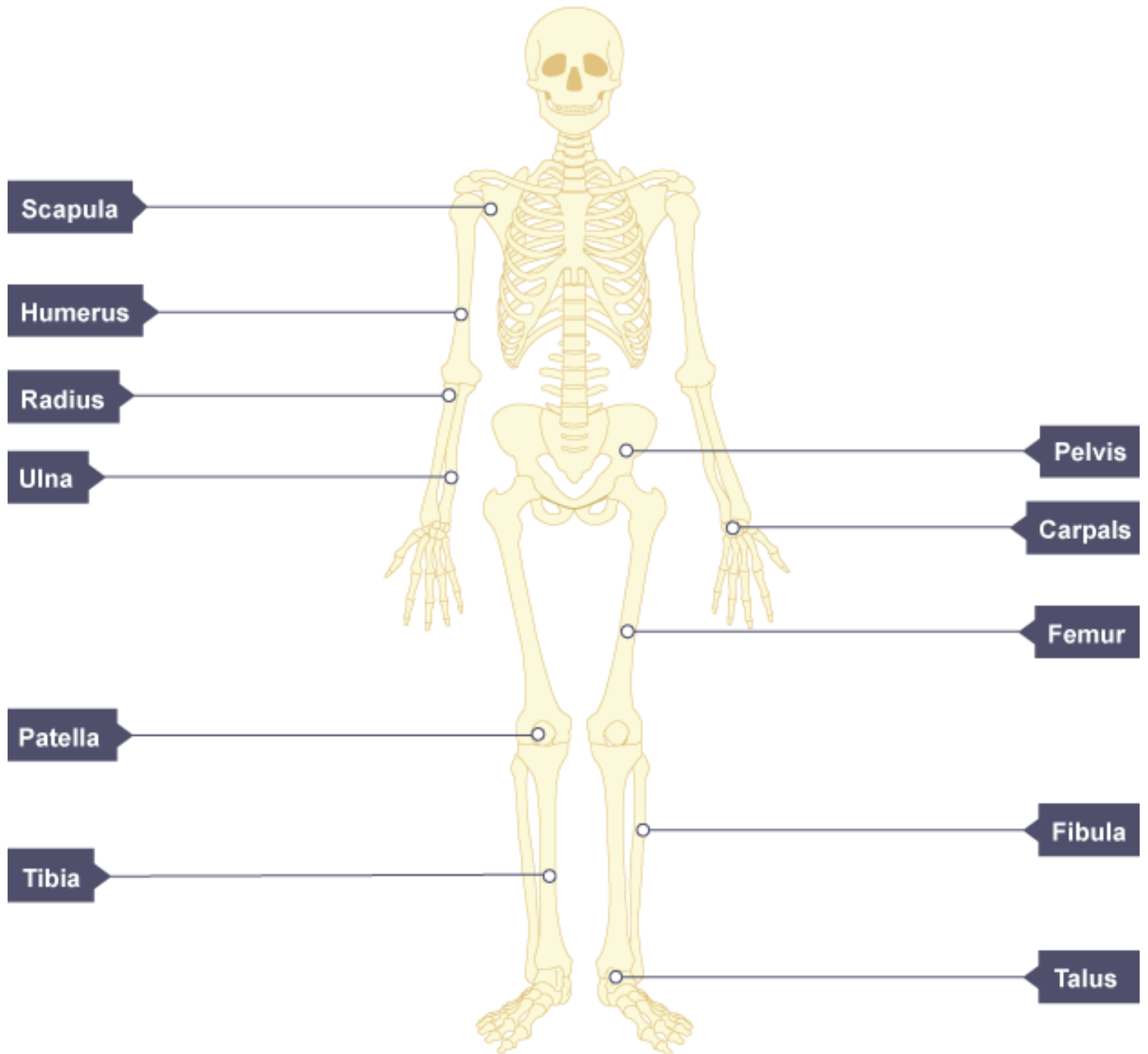
Revision Guide

St Mary's Catholic Academy

GCSE Physical Education



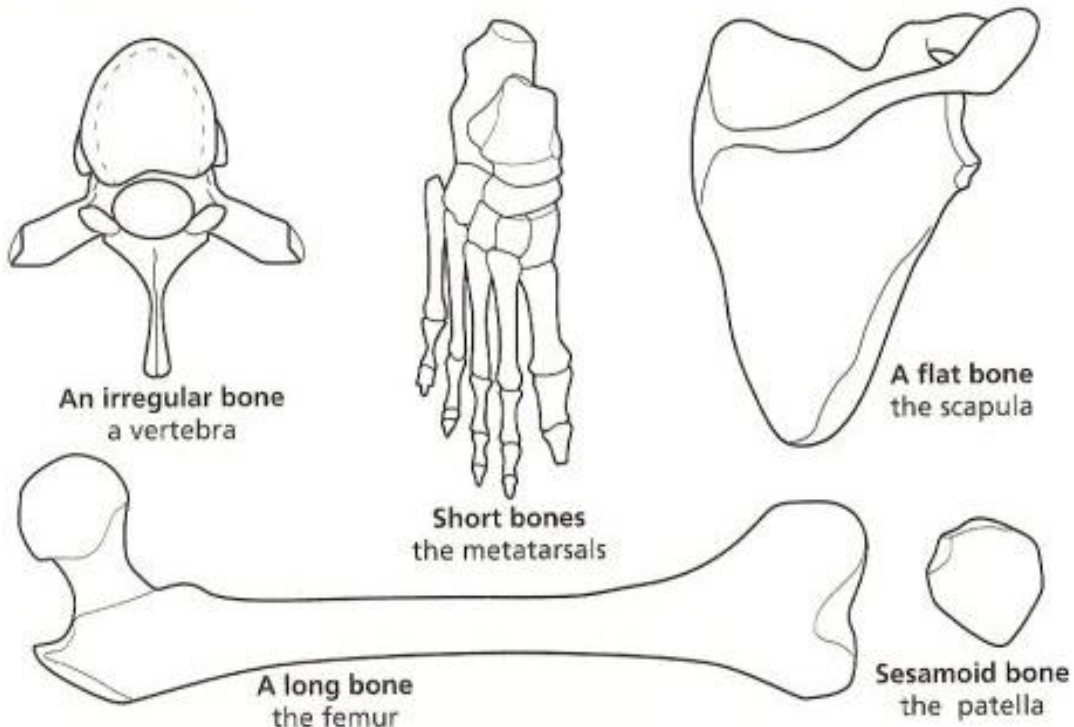
Structure of the skeletal system



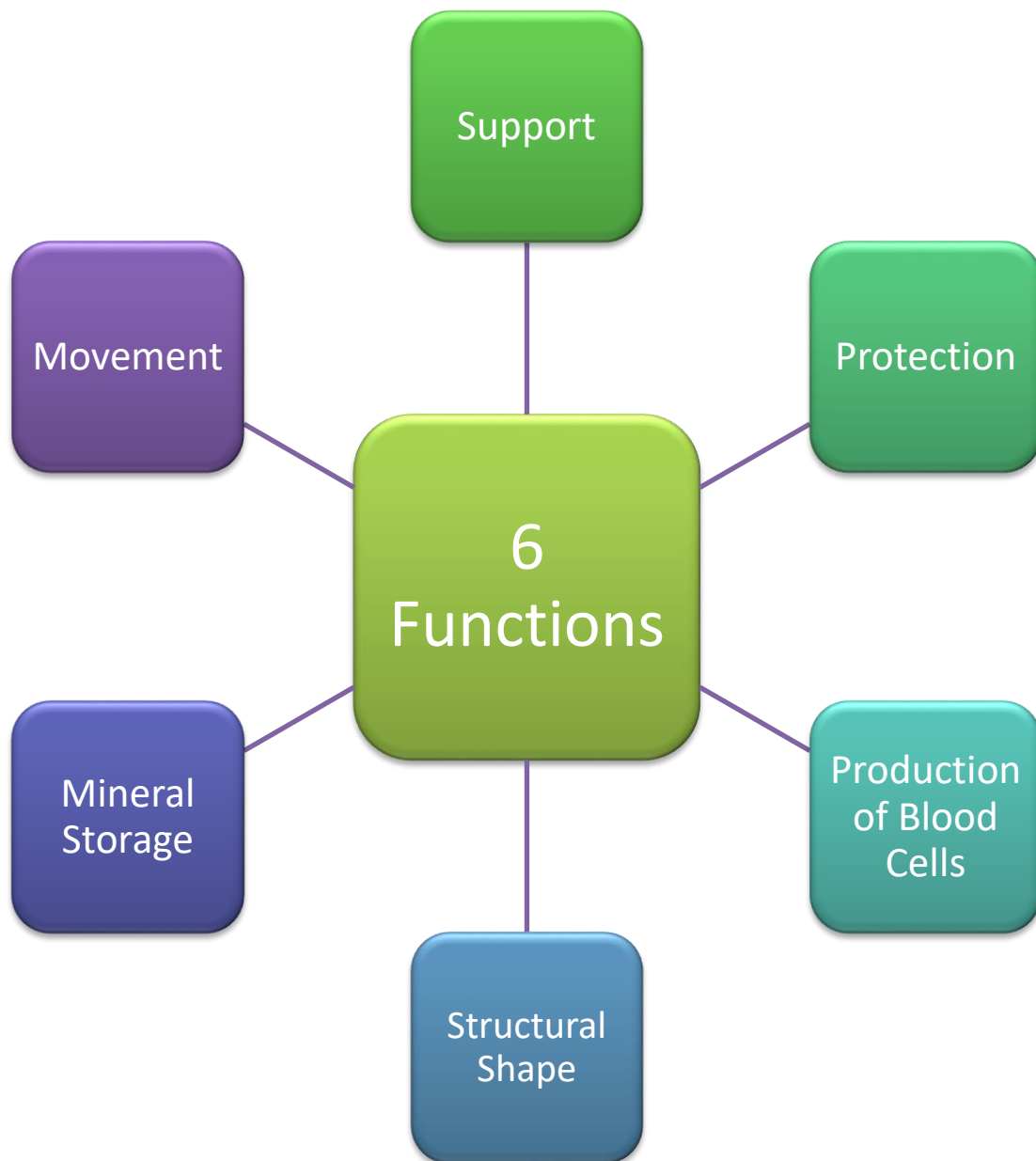
Types of Bones

Within the skeleton there are different kinds of bone. The type of bone determines the amount of movement.

Type Of Bone	Example Of Bone	Function Of Bone
Long	Femur/Humerus	Movement – to generate speed or strength
Short	Carpals/Tarsal	Shock absorption – spreading body load.
Flat	Ribs/Cranium	Protection of vital organs, attachment of muscles to help movement
Irregular	Vertebrae	Provide shape, protection

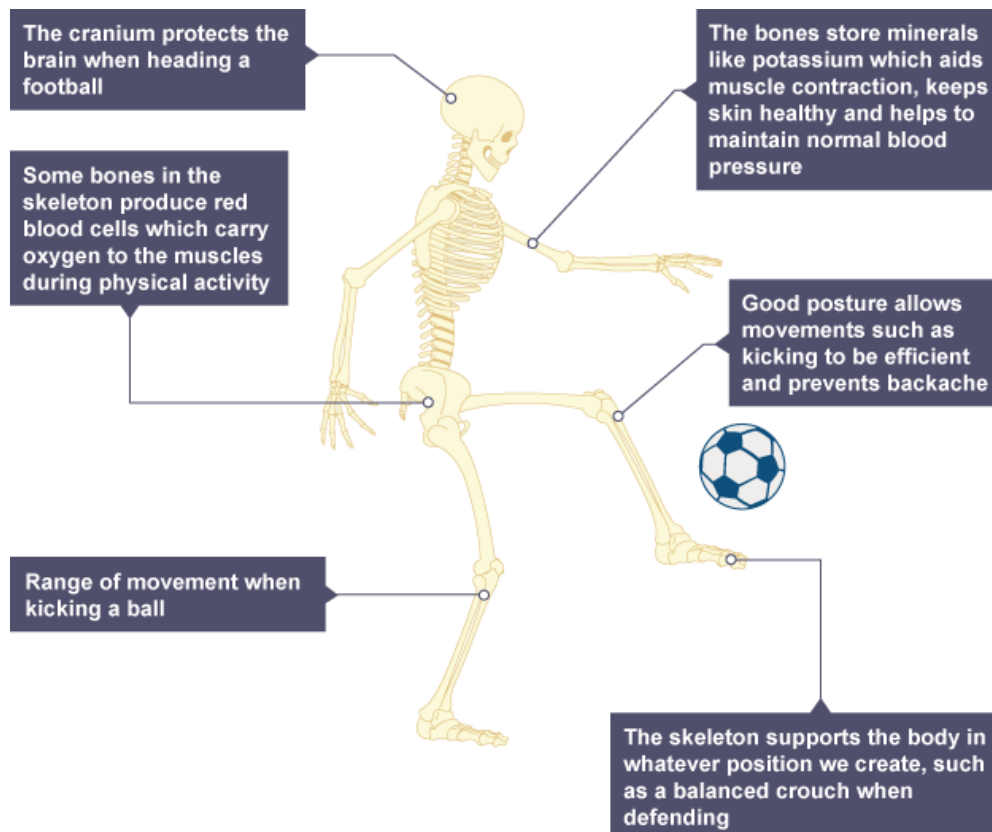


Functions of Bones



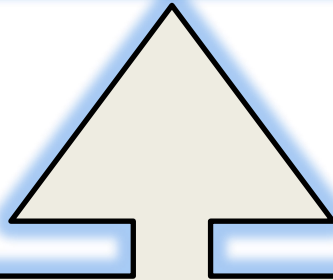
Functions of Bones

Name	Function Purpose
Movement	The skeleton allows movement of the body as a whole and its individual parts. The bones act as levers and also form joints that allow muscles to pull on them and produce joint movements.
Support	The skeleton keeps the body upright and provides a framework for muscle and tissue attachment.
Protection	The bones of the skeleton protect the internal organs and reduce the risk of injury on impact. For example, the cranium protects the brain, the ribs offer protection to the heart and lungs, the vertebrae protect the spinal cord and the pelvis offers protection to the sensitive reproductive organs.
Production Of Blood Cells	Certain bones in the skeleton contain red bone marrow and the bone marrow produces red blood cells , white blood cells and platelets. Examples of bones that contain marrow are the pelvis, sternum, vertebrae and clavicle.
Mineral Storage	The bones themselves are made of minerals and act as a mineral store for calcium and phosphorous, which can be given up if the body requires the minerals for other functions.
Structural Shape	The skeleton provides the human shape and determines the height of a person .



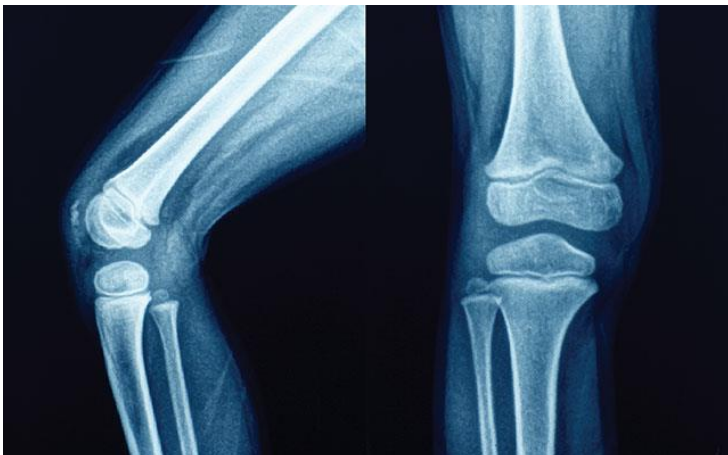
Joints

A joint is a place where two or more bones meet and is also called an articulation.



The role of joints and connective tissue

- 1) Connective tissues consist of ligaments, cartilage and tendons.
- 2) A joint is held together by ligaments which give the joints their stability.
- 3) Cartilage is found at the ends of bones and where joints meet.
- 4) Tendons attach muscles to the skeleton.

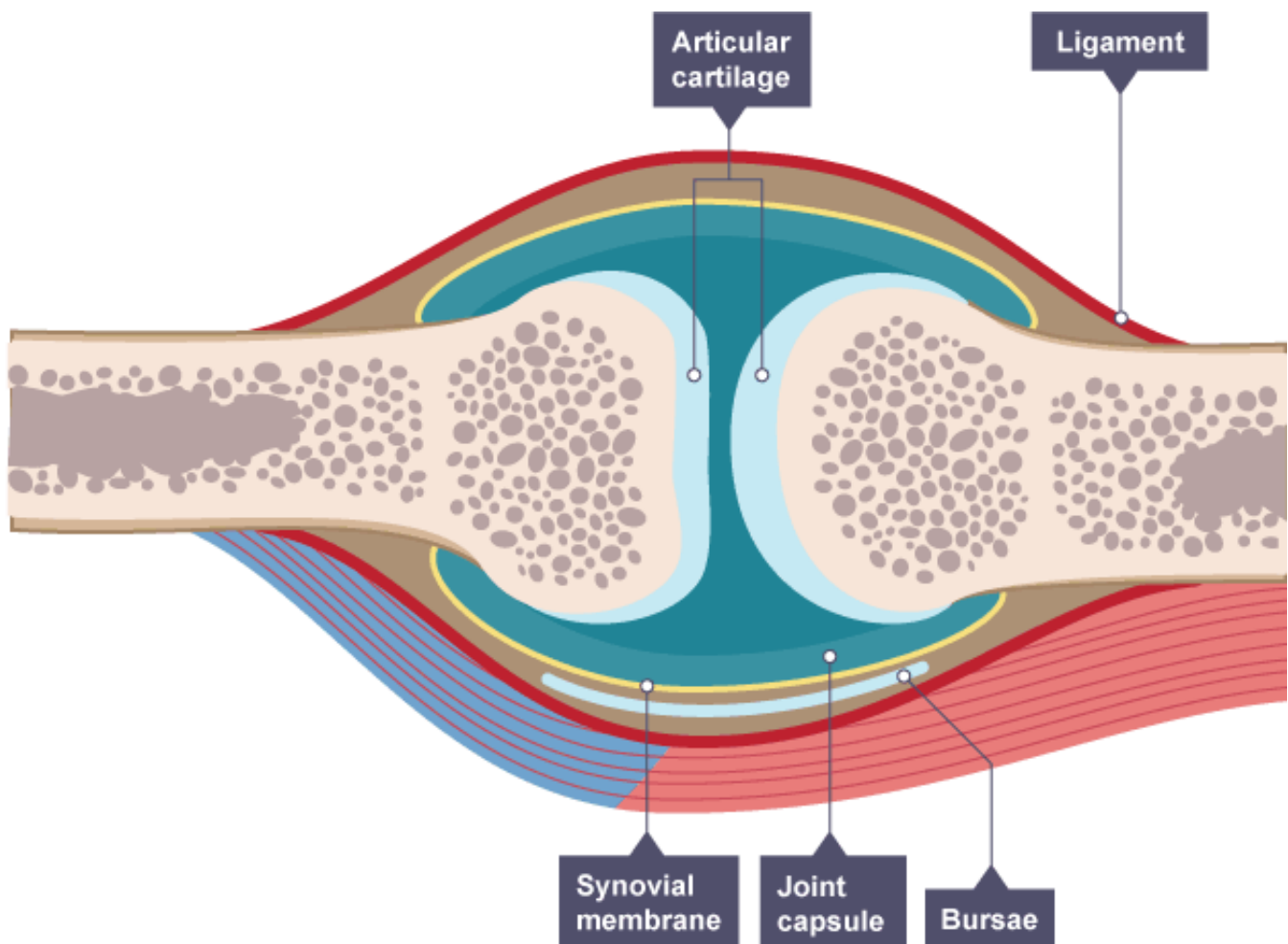


Synovial Joints

Synovial joints (freely movable joints) allow us the free movement to perform skills and techniques during physical activity.

Synovial joints have **synovial fluid** in the joint cavity that lubricates or 'oils' the joint so it moves smoothly. Synovial fluid is made by the **synovial membrane**.

In synovial joints, the ends of the bones are covered with **cartilage** which cushions the joint and **prevents friction and wear and tear between the bone ends**. Cartilage is a **soft, spongy connective tissue** it prevents wear and tear on the bones.



Synovial Joints

The bones in a synovial joint are connected by ligaments, which:

- 1) A type of connective tissue and are **tough, fibrous and slightly elastic**
- 2) Connect bone to bone and **help keep the joint together**
- 3) **Stabilise the joints during movement** and prevent dislocation by restricting actions outside the normal joint range
- 4) **Can absorb shock** because of their elasticity, which protects the joint
- 5) Help **maintain correct posture** and movement

The movement at a synovial joint is caused by the muscles attached across the joint. Muscles are attached to bone by tendons. Tendons are very strong, inelastic connective tissues that allow a muscle to pull on a bone to move it.

Name of Synovial Joint	Location and Function
Ball and Socket	Found in the shoulder and hip . This joint allows for the greatest range of movement.
Hinge	Found at the elbow and knee . The range of movement is limited to one plane.
Condylloid	Found at the wrist and ankle . Movement in two planes.
Pivot	Found in the neck . Part of the bone fits into another ring of bone.
Saddle	Found at the base of the thumb . This joint allows movement in two directions.
Gliding	Found in the wrist and veritable column . Two bones have a small range of movement limited by connected ligaments.

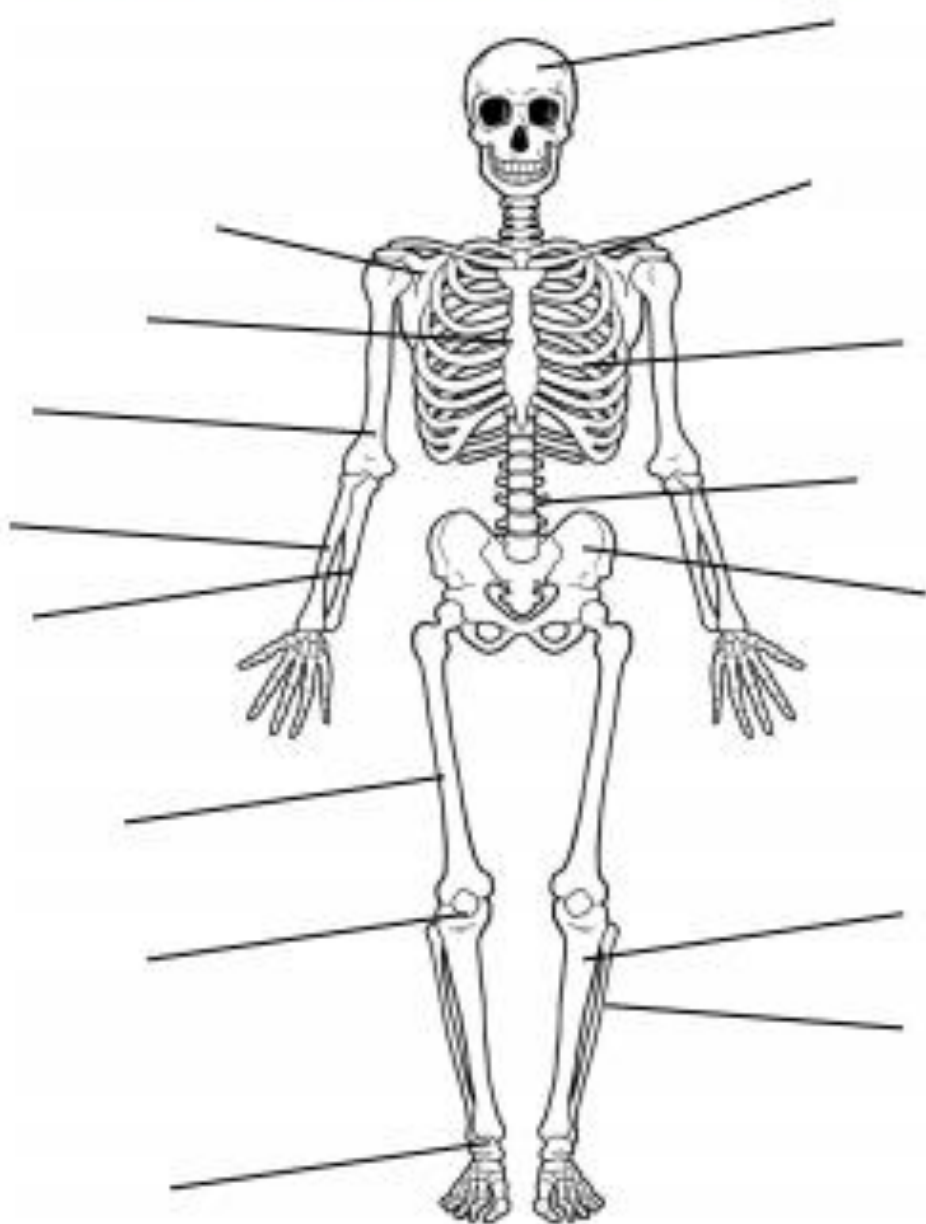
Types of Joint Movement

The different types of movement that are permitted at each joint are described below.

Flexion	Bending a joint. This occurs when the angle of a joint decreases. For example, the elbow flexes when performing a biceps curl.
Extension	Straightening a joint. This occurs when the angle of a joint increases, for example, at the elbow when putting a shot.
Abduction	Movement away from the midline of the body. This occurs at the hip and shoulder joints during a jumping jack movement.
Adduction	Movement towards the midline of the body. This occurs at the hip and shoulder, returning the arms and legs back to their original position from a jumping jack movement.
Rotation	This is where the limb moves in a circular movement around a fixed joint towards or away from the midline of the body. This occurs in the hip in golf while performing a drive shot.
Plantar Flexion	Pointing the toes – this movement only occurs at the ankle, for example, pointing the toes in ballet
Dorsiflexion	The foot moves towards the shin as if you are pulling your toes up. This movement only occurs at the ankle.



Label the bones on the skeleton using the words below.



Scapula

Humerus

Ribs

Cranium

Radius

Talus

Femur

Clavicle

Ulna

Pelvis

Sternum

Fibula

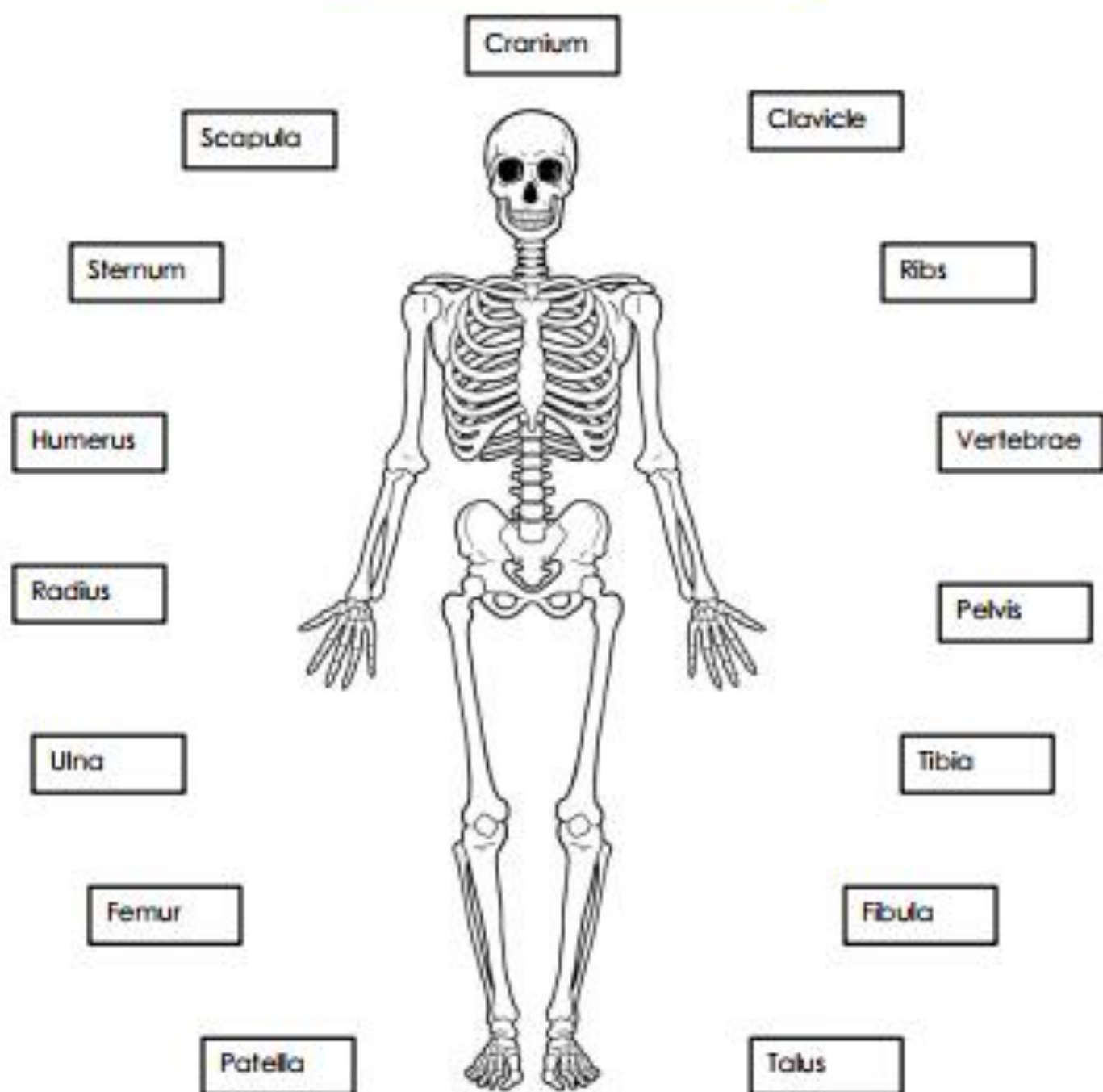
Patella

Tibia

Vertebrae

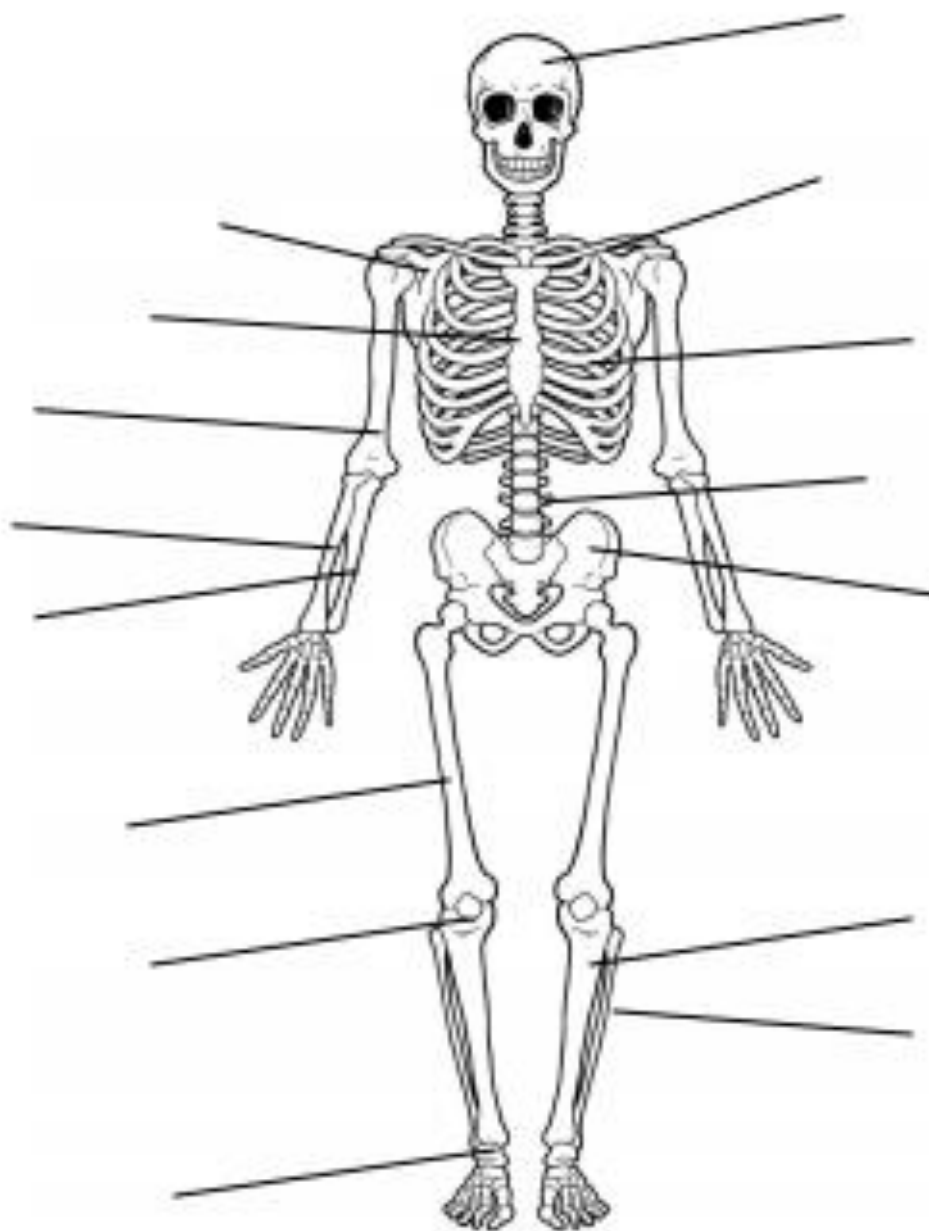
AQA GCSE – The Skeletal System Labelled

Colour in the area of the skeleton the same colour as the label to match the correct label to the bone.



AQA GCSE – The Skeletal System Labelled

Label the skeleton from memory



Extension Activity:

Create a revision tool to help yourself or a friend remember the names and locations of the bones of the skeleton.

Quick Questions

Which gel like substance helps to lubricate the movement of joints?

- 1) Articular Cartilage
- 2) Bursae
- 3) Synovial Fluid

Which two bones connect at the shoulder?

- 1) Scapula and Sternum
- 2) Scapula and Humerus
- 3) Humerus and Sternum

What types of bones, such as carpals are designed for strength and weight bearing?

- 1) Irregular bones
- 2) Long bones
- 3) Short bones

In which part of a bone are blood cells produced?

- 1) Bone marrow
- 2) Ends of bones
- 3) Cartilage

Which function of the skeleton is most relevant during a powerful tackle in rugby?

- 1) Protection
- 2) Mineral storage
- 3) Blood cell production

Which type of connective tissue helps to stabilise the ankle joint during the dynamic movement of a badminton match?

- 1) Articular cartilage**
- 2) Synovial fluid**
- 3) Ligaments**

Which of the following joints is an example of a hinge joint?

- 1) Hip**
- 2) Shoulder**
- 3) Ankle**

Which kind of joint movement describes the movement of a limb in a circle around a fixed point such as the action of the hip in a golf drive?

- 1) Flexion**
- 2) Extension**
- 3) Rotation**

Which of these movements only occurs at the ankle?

- 1) Plantar Flexion**
- 2) Adduction**
- 3) Extension**

Which type of joint allows for flexion, extension, abduction and adduction?

- 1) Pivot**
- 2) Hinge**
- 3) Ball and socket**

Answers

- 1) Synovial Fluid
- 2) Scapula and humerus
- 3) short bones
- 4) Bone marrow
- 5) Protection
- 6) Ligaments
- 7) Ankle
- 8) Rotation
- 9) Plantar flexion
- 10) Ball and socket

