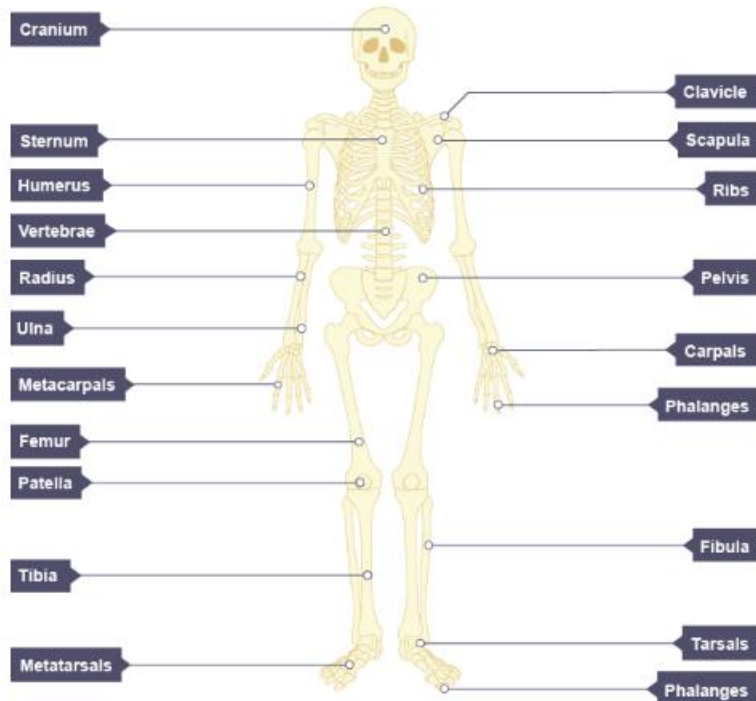


Skeletal System

You should be able to correctly label a blank diagram of the skeleton.



What are the functions of the skeleton?

- Support** – the skeleton keeps the body upright and provides a framework for muscle and tissue attachment.
- Posture** – the skeleton gives the correct shape to our body.
- 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.
- Movement** – the skeleton allows movement of the body as a whole and its individual parts. The bones form joints and act as levers, allowing muscles to pull on them to produce movement.
- Blood cell production** – certain bones in the skeleton contain bone marrow which produces red blood cells.
- Storage of minerals** - the bones store minerals such as calcium, iron, potassium and phosphorous and release them into the blood when the body needs to use them.







Example Exam questions:

- Describe the 5 functions of the skeleton (5 marks)
- Give a sporting example of where the skeleton provides protection (1 mark)
- Name the movement possible at a hinge joint (2 marks)
- Name two types of hinge/ball and socket joints (2 marks each)
- Using a sporting example explain the 6 types of movement possible at a ball and socket joint (6 marks)
- What type of movement is being used when the bicep contracts during the upward phase of a bicep curl? (1 mark)
- What type of movement is being used during the outwards phase of a star jump? (1 mark)
- What type of movement is being used at the shoulder when bowling in cricket? (1 mark)
- What is the difference between adduction and abduction (1 mark)
- Putting top spin on a ball in tennis is an example of what movement?(1 mark)

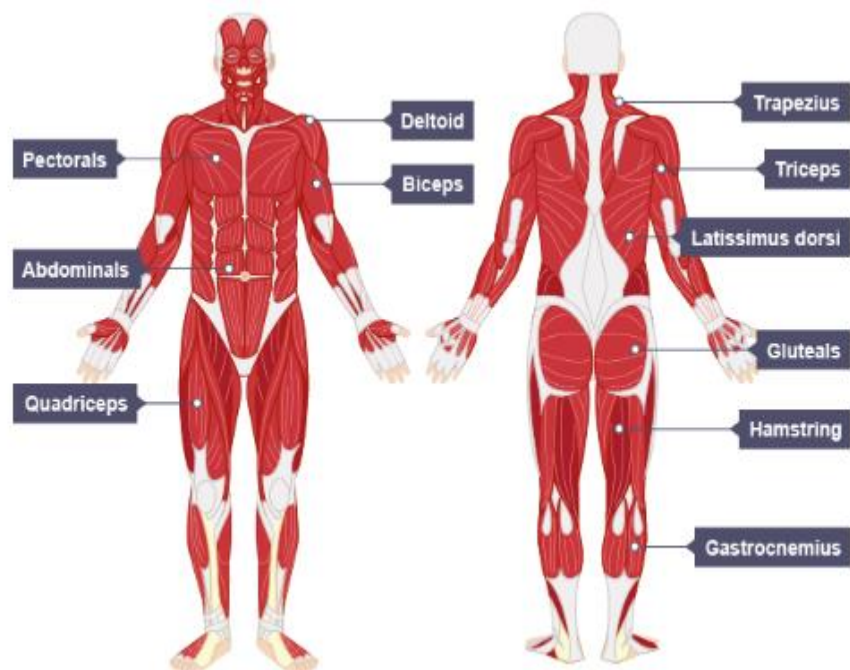
Joints

To allow movement to occur there are two main types of joints you need to learn about.

- Hinge joints** (eg, Elbow and knee) - these only allow flexion and extension.
- Ball and socket joint** (eg. Hip and Shoulder) – these allow flexion, extension, rotation, circumduction, abduction and adduction.

Flexion	Adduction	Rotation
Decreasing the angle at a joint (bending) 	Limbs moving towards the midline of the body. 	A twisting/turning action around a joint. 
Extension	Abduction	Circumduction
Increasing the angle at a joint (straightening) 	Limbs moving away from the midline of the body. 	A combination of flexion, extension, adduction & abduction. 

Introductions to the Muscular System



You should be able to correctly label a blank diagram of the muscular system.

Key terms to learn

Ligament: Connect bone to bone and stabilise a joint during movement.

Tendon: Connect bone to muscle to create a lever. This allows the muscle to pull the bone to create movement.

Cartilage: Found between two bones and prevents rubbing of the bones during movement. It also acts as a shock absorber to prevent bones banging against each other and becoming damaged, for example when landing in the long jump.

Antagonistic pair: two muscles which work together to create movement.

One will contract whilst the other relaxes. For example the bicep and tricep or the Hamstring and the quadricep.

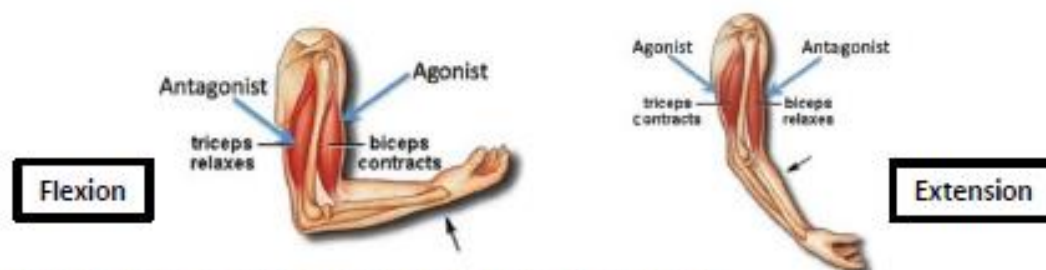
Agonist: The muscle which contracting and shortening to create movement. Sometimes called the "prime mover"

Antagonist: This is the muscle which relaxes and lengthens during movement.

Now you know the difference between flexion and extension we can look at what causes that movement to happen at the elbow and the knee.

Antagonistic pairs - Muscles are arranged in antagonistic pairs.

As one muscle contracts (shortens) its partner relaxes (lengthens) i.e. *Biceps and Triceps*.



Agonist = the muscle that contracts to produce movement.

Antagonist = the muscle that relaxes to allow the movement to occur.

Examples in the body:

- Biceps & Triceps
- Quadriceps & Hamstring

You will need to be able to apply your knowledge of antagonistic pairs for these two examples in sporting contexts. For example:

1. The **bicep is the agonist** and the **tricep is the antagonist** when flexing at the elbow during the upwards phase of a bicep curl.
2. The **tricep is the agonist** and the **bicep is the antagonist** when extending at the elbow, for example when performing a jab in boxing.
3. The **quadriceps are the agonist** and the **hamstring is the antagonist** when extending at the knee to pass a football.
4. The **hamstring is the agonist** and the **quadriceps are the antagonist** whilst flexing at the knee during the downwards phase of a squat when getting ready to jump in high jump.

Possible exam questions:

Give a sporting example when the bicep (or tricep/hamstring/quardicep) is the agonist. (1 mark)

You may be given a picture of a limb and asked to label the names of muscles or label the agonist and antagonist. (1 mark)

Describe the role of ligaments for a basketball player (2 marks)

Describe the role of cartilage of for a marathon runner (2 marks)

Describe the role of tendons for a gymnast (2 marks)