GCSE Physical Education

Component 1

Part 1

Revision Booklet

The structure and functions of the:

- Skeletal system
- Muscular system
- Cardiovascular system
- Respiratory system

Skeletal System

Topic Number	Description	Pre Revision	Post revision
1.1.1	**The functions of the skeleton applied to performance in physical activities and sports:** • protection of vital organs • muscle attachment • joints for movement • platelets • red and white blood cell production • storage of calcium and phosphorus		
1.1.2	**Classification of bones:** • long (leverage) • short (weight bearing) • flat (protection, broad surface for muscle attachment) • irregular (protection and muscle attachment) Applied to performance in physical activities and sports		
1.1.3	**Structure of the skeleton:** cranium, clavicle, scapula, five regions of the vertebral column (cervical, thoracic, lumbar, sacrum, coccyx), ribs, sternum, humerus, radius, ulna, carpals, metacarpals, phalanges (in the hand), pelvis, femur, patella, tibia, fibula, tarsals, metatarsals, phalanges (in the foot) Explain how they are applied to performance in physical activities and sports		
1.1.4	**Classification of joints:** • pivot (neck – atlas and axis) • hinge (elbow, knee and ankle) • ball and socket (hip and shoulder) • condyloid (wrist) Their impact on the range of possible movements		
1.1.5	**Movement possibilities at joints dependant on joint classification:** flexion, extension, adduction, abduction, rotation, circumduction, plantar-flexion, dorsi-flexion Give examples of physical activity and sporting skills and techniques that utilise these movements in different sporting contexts		

1.1.6	The role of ligaments and tendons, and their relevance to participation in physical activity and sport		
Areas of Strength			
Areas to revise			

Functions of the skeleton

- protection of vital organs
- muscle attachment
- joints for movement
- platelets
- red and white blood cell production
- storage of calcium and phosphorus

The cranium **protects** the brain when heading the ball

The ribs **protect** the vital organs such as the heart and lungs when getting tackled in rugby

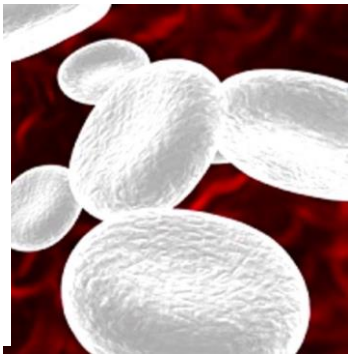
Bones provide anchors for **muscles to attach**. Tendons attach muscles to bones. Muscles pull on bones to create movement

Bones act as levers to create **movement**. The longer the levers the greater the force.

Platelets clot blood when we are cut to stop the bleeding

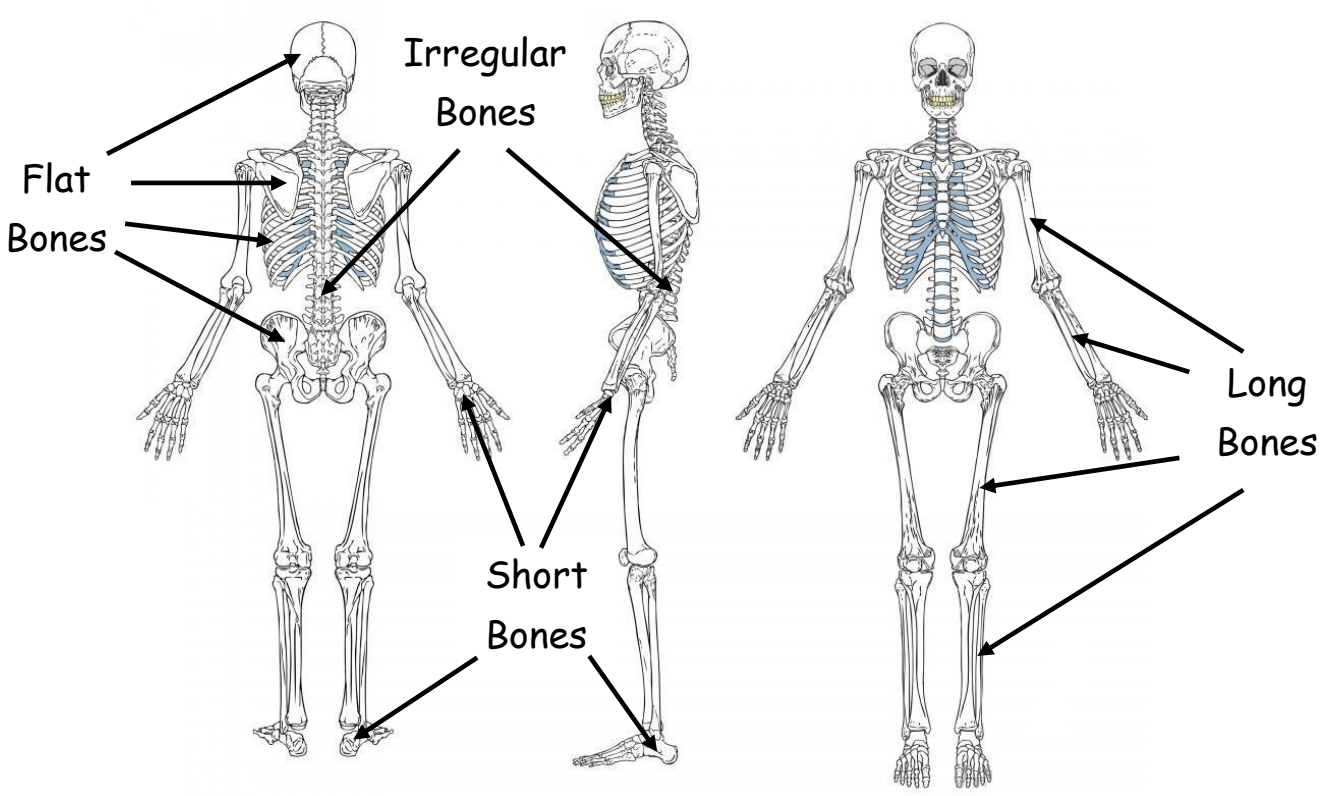
Red blood cells carry oxygen that is delivered to the working muscles during exercise

White blood cells fight infection so we are fit to take part in physical activity

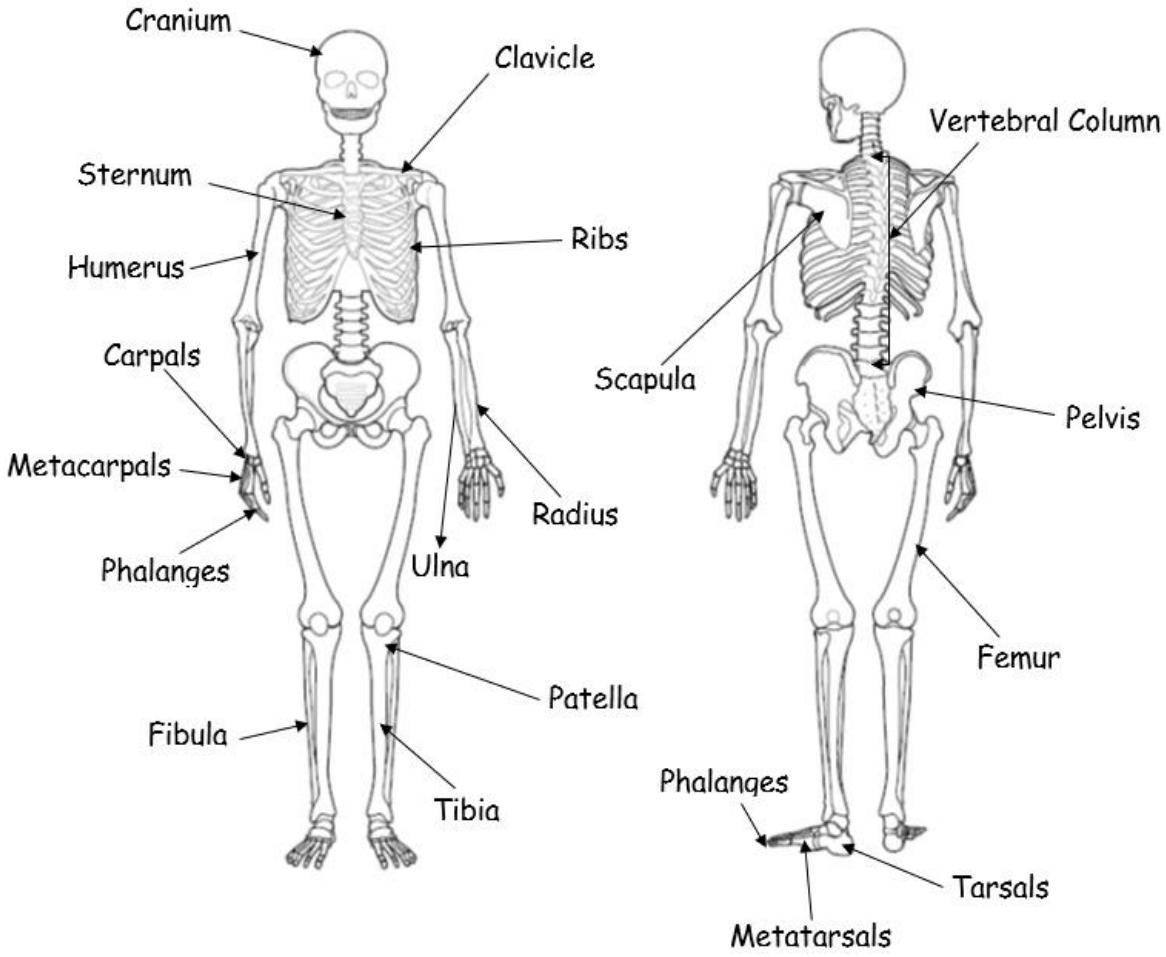


Calcium and Phosphorus is stored in the bones to keep them strong

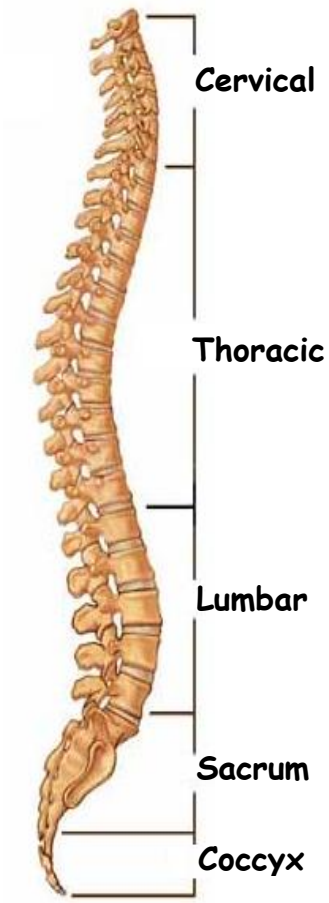
Type of Bone	Examples	General function
Long	Humerous Ulna Phalanges Tibia Fibula	They are longer than they are wide. In sport they are vital to generate movement, speed and strength. They usually act as levers to enable the body to move.
Short	Tarsals Carpals	They are roughly the same size in length, width and thickness. In sport they are important to shock absorb the weight of the body when running, jumping and dancing etc… Short bones are important for all weight bearing exercises
Flat	Ribs Stetrnum Patella Scapula Sternum	Flat bones usually protect organs or offer a good 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. Muscles are needed for movement. The scapula has three different muscle groups attached to it.
Irregular	Vertebral Column: • Cervical • Thoracic • Lumbar • Sacrum • Coccyx	Irregular bones have odd shapes and perform a range of functions. Some have a special shape so they can protect something, others have a lot of attachment points for muscles. When playing sport the top two vertebrae allow us to nod and rotate the head, the vertebrae protects our back, the sacrum provides many attachment points for muscle attachment.



Structure of the skeleton

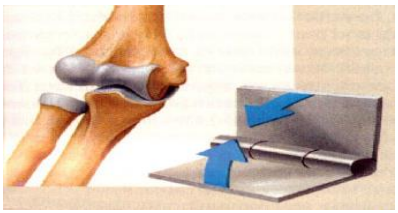
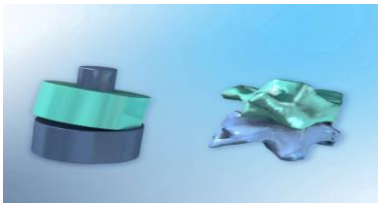
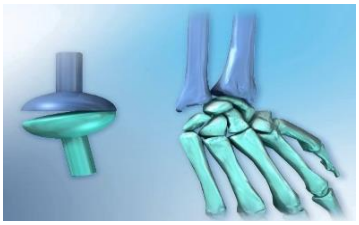


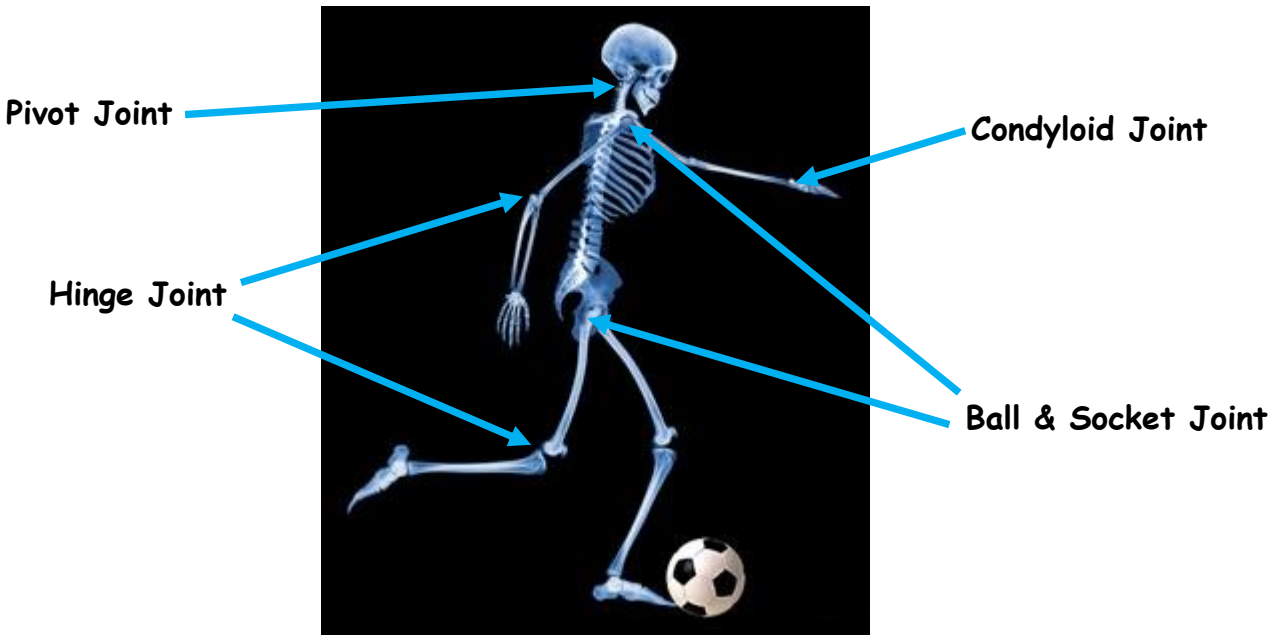
The vertebral column



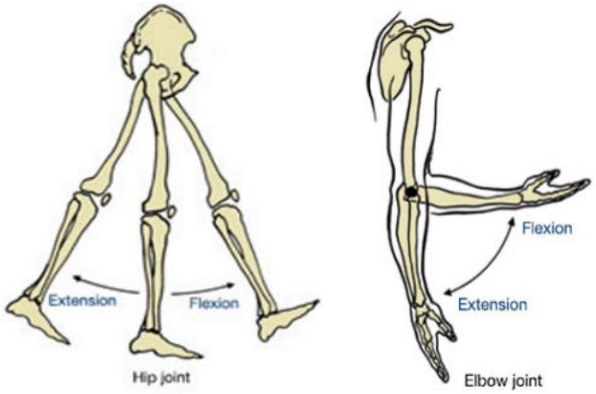
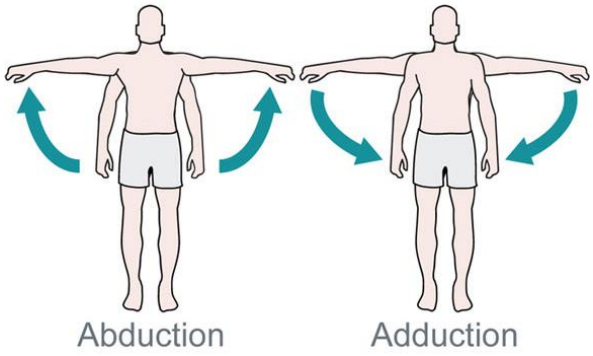
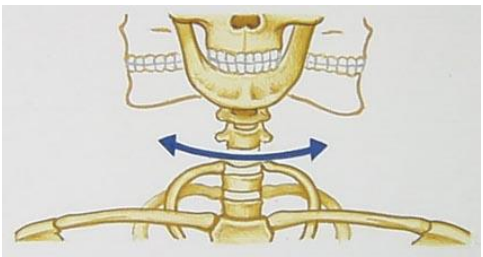
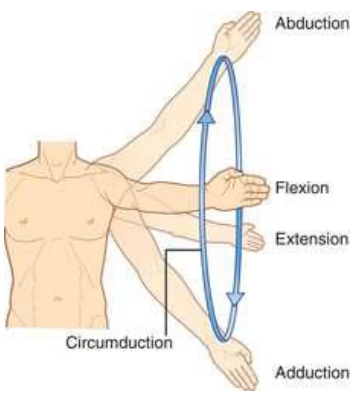
Vertebrae	Description
Cervical	These are the smallest of the vertebrae. They form the neck (Axis & Atlas). They allow the head to move.
Thoracic	These are slightly bigger vertebrae and attach the ribs. They also attach various muscles to the back
Lumbar	These are the largest of the moveable vertebrae. They give us mobility in our lower back, they help support the weight of the vertebrae and also attach various muscles.
Sacrum	These are vertebrae that have fused together. They work together with our hip bones. They also support the weight of the vertebrae.
Coccyx	No function

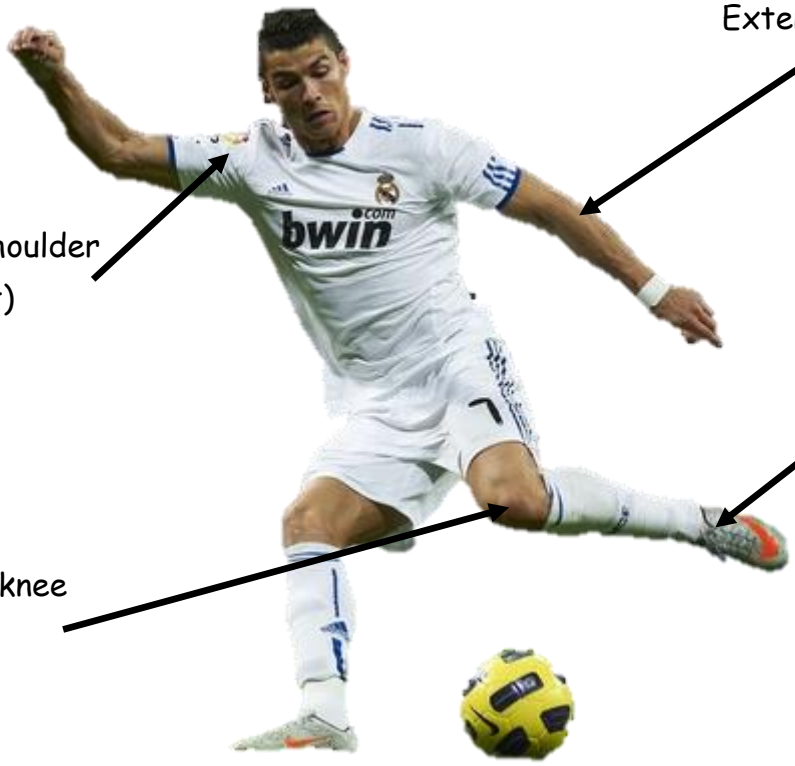
Classification of joints

Type of joint	Where found in the skeleton	Bones involved
Hinge 	**Knee** **Elbow** **Ankle**	**Knee:** Femur, Tibia, Fibula, Patella **Elbow:** Humerus, Radius, Ulna **Ankle:** Tibia, Fibula, Tarsals
Ball and socket 	**Shoulder** **Hip**	**Shoulder:** Scapula, Humerus, Clavicle **Hip:** Pelvis, Femur
Pivot 	**Neck**	**Cervical vertebrae:** Axis, Atlas
Condyloid 	**Wrist**	**Wrist:** Ulna, Radius, Carpals



Movement possibilities at a joint

Movement	Explanation	Examples
Flexion	A bending movement that decreases the angle between body parts	
Extension	A straightening movement that increases the angle between body parts	
Abduction	The movement of a bone or limb away from the midline of a joint	
Adduction	The movement of a bone or limb towards the midline of a joint	
Plantar Flexion	Movement at the ankle joint that points the toes downwards	
Dorsi Flexion	Movement at the ankle joint that points the toes upwards	
Rotation	A rotational movement around a joint or axis	
Circumduction	Is the combination of flexion, extension, abduction and adduction. (Circular motion)	

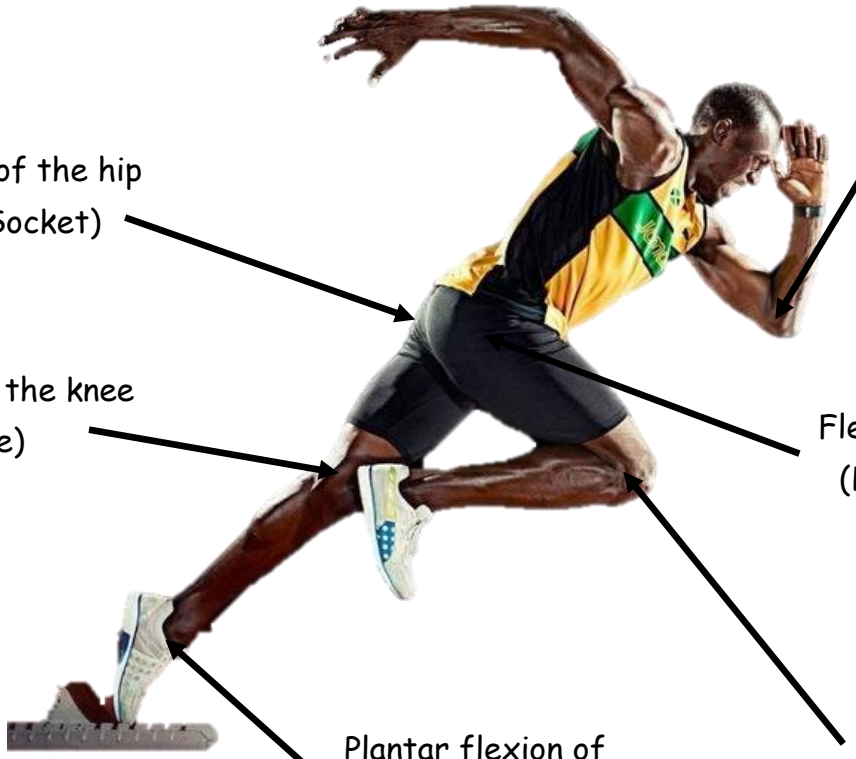


Extension of the elbow (Hinge)

Abduction of the shoulder (ball & Socket)

Plantar flexion of the ankle (Hinge)

Flexion of the knee (Hinge)



Flexion of the elbow (Hinge)

Extension of the hip (Ball & Socket)

Extension of the knee (Hinge)

Flexion of the hip (Ball & Socket)

Plantar flexion of the ankle (Hinge)

Flexion of the knee (Hinge)

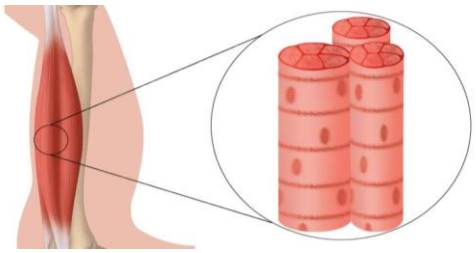
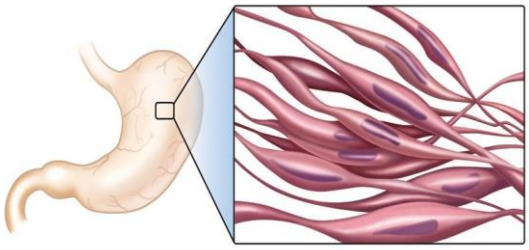
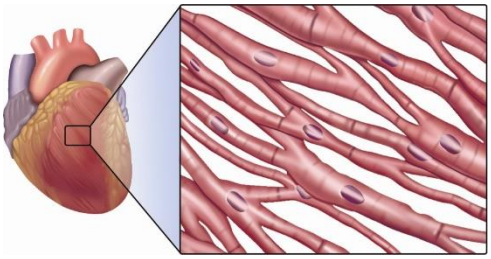
The role of ligaments and tendons

	Description	Benefit to sport
Ligaments 	A ligament is made from tough elastic fibrous tissue. Its main function is to join bone to bone Not much blood flows through ligaments which means they heal more slowly from a sprain or tear. Warming up such as stretching will help prevent injury to ligaments.	Ligaments help stabilise joints. When kicking a ball in football the ligaments in the knee will help stabilise the joint. Strong ligaments can prevent injuries such as a dislocation
Tendons 	Tendons are made from tough non-elastic fibrous tissue Tendons attach muscles to bones Training helps strengthen tendons. The more you use your tendons the stronger they will be. The tendons in your leg will be stronger than the tendons in your wrist	Without tendons movement would not be possible. Tendons attach muscles to bones so they can pull them when they contract Tendons help provide powerful movements such as kicking, jumping and kicking

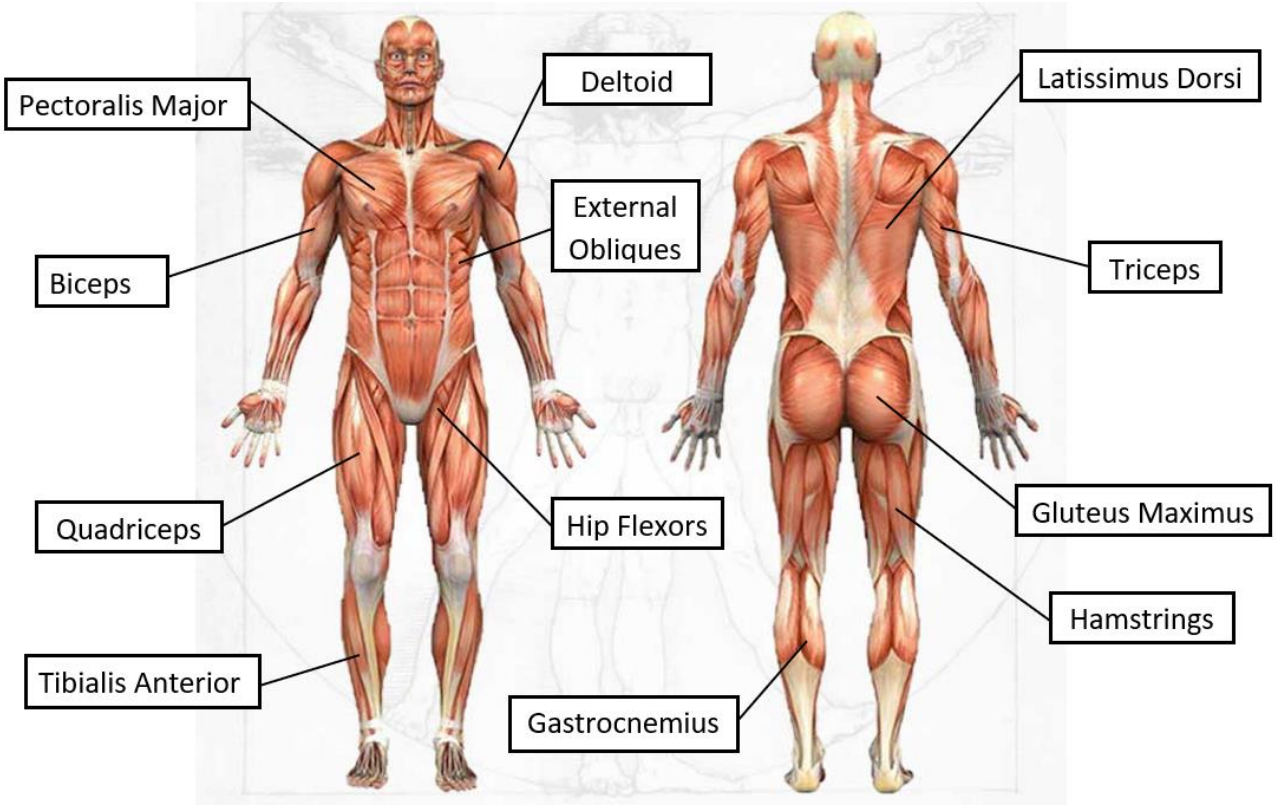
Muscular System			
Topic Number	**Description**	**Pre Revision**	**Post revision**
1.1.7	**Classification and characteristics of muscle types:** • voluntary muscles of the skeletal system • involuntary muscles in blood vessels • cardiac muscle forming the heart Understand their roles when participating in physical activity and sport		
1.1.8	**Location and role of the voluntary muscular system**. Explain how they work with the skeleton to bring about specific movement during physical activity and sport, and the specific function of each muscle: • Deltoid • Biceps • Triceps • pectoralis major • latissimus dorsi • external obliques • hip flexors • gluteus maximus • quadriceps • hamstrings • gastrocnemius • tibialis anterior		
1.1.9	**Antagonistic pairs of muscles** (agonist and antagonist) to create opposing movement at joints to allow physical activities e.g. • gastrocnemius and tibialis anterior acting at the ankle • quadriceps and hamstrings acting at the knee • biceps and triceps acting at the elbow • hip flexors and gluteus maximus acting at the hip All flexion to extension		

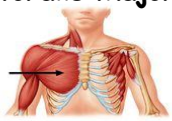
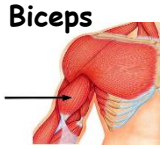
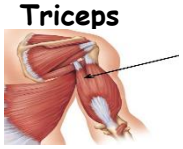
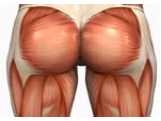
1.1.10	**Characteristics of fast and slow twitch muscle fibre types** • type I • type IIa • type IIx Explain how these impact on their use in physical activities		
1.1.11	How the skeletal and muscular systems work together to allow participation in physical activity and sport		
Areas of Strength			
Areas to revise			

Classification of muscle types

Classification of muscle	Description
Voluntary Muscles 	• Voluntary muscle are the muscles around the skeleton • We have control over them (consciously controlled) • They attach to the skeleton by tendons
Involuntary Muscles 	• Examples include: blood vessels, the stomach and intestines • We do not have control over them (unconsciously controlled) • They contract slowly and rhythmically
Cardiac Muscle 	• Found in the walls of the heart • When they contract they pump blood around the body • We do not have control over them (unconsciously controlled)

Voluntary muscles

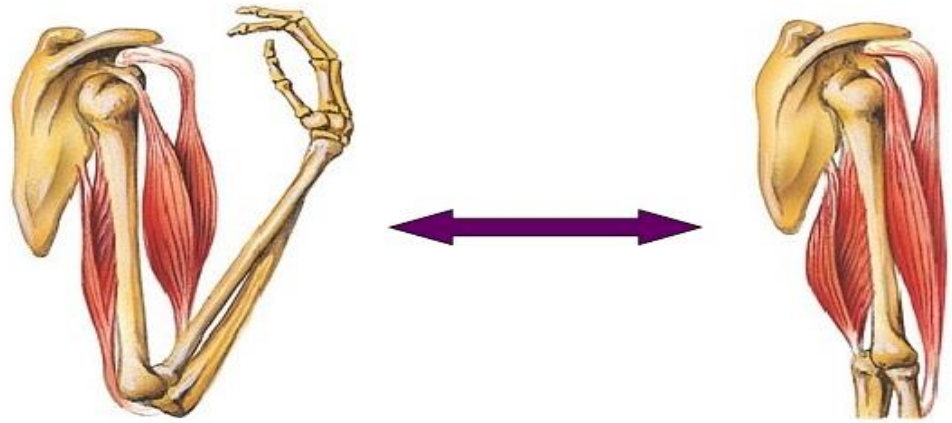


Muscle	Location	Function	Sporting Example
Deltoid 	Triangular muscle on the uppermost part of the arm and the top of the shoulder	Move the upper arm in all directions from the shoulder	Serve in tennis Front Crawl Cricket Bowling
Pectoralis Major 	Muscle covering the chest	Adducts the arm at the shoulder	Forehand drive in tennis Hand off in rugby Boxing hook
Latisimus Dorsi 	Back muscle that extends from the lower spine to the upper arm.	Adducts and extends the arm at the shoulder	Butterfly stroke Pull ups Rowing stroke
Biceps 	Front of Upper Arm	Elbow flexion (bending)	Boxing Uppercut Preparing to Throw a Dart or javelin
Triceps 	Back of Upper Arm	Elbow extension (straightening)	Press-up Throwing a javelin Hand off in rugby Boxing Jab
External Obliques 	Side of the abdomen	Pulls the chest downwards Flexion and rotation at spinal column	Crunches
Gluteus Maximus 	Form the buttocks	Adducts and extends the hips pulling the leg backwards	Pull leg back before kicking a ball Leg position in the blocks 100m
Hip Flexors 	Front of the hip and connect the leg, pelvis and abdomen	Flexes the hip, moves the hip upwards	Lifting knees when sprinting
Quadriceps 	Front of Upper Leg	Knee extension (straightening)	Kicking a ball Jumping upwards on a lay-up shot
Hamstrings 	Back of Upper Leg	Knee flexion (bending)	Bending knee before kicking a ball Bending knees before jumping
Gastrocnemius 	Calf muscle, attached by the Achilles tendon	Plantar flexion, points the toes	Running Diving and gymnastics
Tibialis Anterior 	Muscle that runs down the shin	Dorsi flexion, pulls toes upwards	Ski jumping Hurdling

Antagonistic Muscle Pairs

Muscles work together to provide movement of the joints
When one muscle contract the other muscle relaxes
When muscle work like this it is called antagonistic pairs
The muscle that contracts is called the agonist
The muscle that relaxes is called the antagonist

The biceps and triceps work together



When we bend the elbow (flexion) the biceps contract and the triceps relax

Agonist = Biceps
Antagonist = Triceps

When we straighten the elbow (extension) the triceps contract and the biceps relax

Agonist = Triceps
Antagonist = Biceps

The quadriceps and hamstrings work together

When we bend the knee (flexion) the hamstrings contract and the quadriceps relax

Agonist = Hamstrings
Antagonist = Quadriceps

When we straighten the elbow (extension) the triceps contract and the biceps relax

Agonist = Quadriceps
Antagonist = Hamstrings

The gastrocnemius and tibialis anterior work together

When we point our toes (plantar-flexion) the gastrocnemius contracts and the tibialis anterior relaxes

Agonist = Gastrocnemius
Antagonist = Tibialis Anterior

When we point our toes upwards (dorsi-flexion) the tibialis anterior contracts and the gastrocnemius relaxes

Agonist = Tibialis Anterior
Antagonist = Gastrocnemius

The hip flexors and the gluteus maximus work together

When we extend our leg at the hip (move backwards) the gluteus maximus contracts and the hip flexors relaxes

Agonist = Gluteus Maximus
Antagonist = Hip Flexors

When we flex our leg at the hip (move forwards) the hip flexors contracts and the gluteus maximus relaxes

Agonist = Hip Flexors
Antagonist = Gluteus maximus

Sporting examples

Joint Action = Plantar Flexion
Agonist = Gastrocnemius
Antagonist = Tibialis Anterior

Joint Action = Flexion at the hip
Agonist = Hip Flexors
Antagonist = Gluteus Maximus

Joint Action = Flexion at the elbow
Agonist = Biceps
Antagonist = Triceps

Joint Action = Dorsi Flexion
Agonist = Tibialis Anterior
Antagonist = Gastrocnemius

Muscle fibre types

Muscle fibres are made up of different muscle fibres. Muscle fibres are either **Fast twitch** or **slow twitch**. They fall into three categories.

- Type I (Slow Twitch)
- Type IIa (Fast Twitch)
- Type IIx (Fast Twitch)

Different types of muscle fibres have different capabilities and are recruited depending on what task they are doing.

Key Words

Aerobic = is the process of producing energy from using oxygen

Anaerobic = is the process of producing energy without using oxygen

Myoglobin = found in the muscle, it helps transports oxygen from the blood to the muscles

Mitochondria = found in cells and produce energy during aerobic respiration

Capillaries = one cell thick blood vessels that allow the exchange of gases

Characteristics

Characteristic	Slow Twitch Type I	Fast Twitch Type IIa	Fast Twitch Type IIx
Force of Contraction	Low	High	Very high
Speed of Contraction	Slow	Medium	Fast
Resistance to Fatigue	High	Moderate	Low
Aerobic or Anaerobic	Aerobic	Aerobic & Anaerobic	Anaerobic
Myoglobin	High	Medium	Low
Mitochondria	High	Medium	Low
Capillary Network	Good	Moderate	Low

Sporting Examples

- Mo Farah is an Olympic gold medallist in the 10,000m
- His event requires mainly type I muscle fibres
- These muscle fibres have a high resistance to fatigue so they can work for a long period of time without getting tired.
- The 10,000m is an aerobic event which means it uses oxygen, therefore the muscle fibres are high in both myoglobin, mitochondria they also have a good capillary network, all of these, assist getting oxygen to the working muscles and creating energy

- Usain Bolt is an Olympic gold medallist in the 100m
- His event requires mainly type IIx muscle fibres
- These muscle fibres contract with high force and very fast which makes them ideal for working at high intensity for a short period of time
- Because the event is anaerobic and doesn't use oxygen the muscle fibres are low in mitochondria and myoglobin and have a low capillary network

- Shaunae Miller is an Olympic gold medallist in the 400m
- His event requires mainly type IIa muscle fibres
- It isn't a sprint and it isn't an endurance event
- These fibres contract fast and have a medium force
- The event is both aerobic and anaerobic, because it is partly aerobic muscle fibres contain moderate amounts of myoglobin and mitochondria. It has a moderate capillary network

Cardiovascular System

Topic Number	Description	Pre Revision	Post revision
1.2.1	**Functions of the cardiovascular system** Explain how they are applied to performance in physical activities: • transport of oxygen, carbon dioxide and nutrients • clotting of open wounds, • regulation of body temperature		
1.2.2	**Structure of the cardiovascular system:** • Atria • Ventricles • Septum • Tricuspid • Bicuspid • semi-lunar valves • aorta • vena cava • pulmonary artery • pulmonary vein Explain their role in maintaining blood circulation during performance in physical activity and sport		
1.2.3	**Structure of arteries, capillaries and veins** Explain their structure, function and importance during physical activity and sport in terms of blood pressure, oxygenated, deoxygenated blood and changes due to physical exercise		
1.2.4	**Redistribution of blood flow** Explain the mechanisms required (vasoconstriction, vasodilation) and the need for redistribution of blood flow (vascular shunting) during physical activities compared to when resting		
1.2.5	**Function and importance of blood** • Red • white blood cells • platelets • plasma Explain their importance in physical activity and sport		

Areas of Strength	
Areas to revise	

The cardiovascular system

The cardiovascular system consists of the heart, blood and blood vessels

- **The heart** pumps blood around the body
- **Blood** transports gasses, blood cells and nutrients
- **Blood vessels** carry the blood

Functions of the cardiovascular system

Function	Explanation
Transport of nutrients	Nutrient we eat are broken down from the food we eat and transported to the body in the blood
Transport of oxygen	The cardiovascular system transported oxygen around the body in the blood Oxygen is needed to provide energy to the working muscles during aerobic exercise
Transport of carbon dioxide	Carbon dioxide is produced as a by-product during energy production. The cardiovascular system takes carbon dioxide away from the muscles to the lungs and exhaled.
Clotting of open wounds	Blood contains blood cells called platelets. They are transported in the blood. They help to clot wounds by performing a plug to prevent blood loss
Regulation of body temperature	Blood vessels cab help regulate body temperature. When we get hot blood vessels near the skin will get bigger (**vasodilation**) this will increase blood flow so heat can radiate from the skin When we get cold the blood vessels near the skin will get smaller (**vasoconstriction**) this will decrease blood flow so less heat is lost through radiation

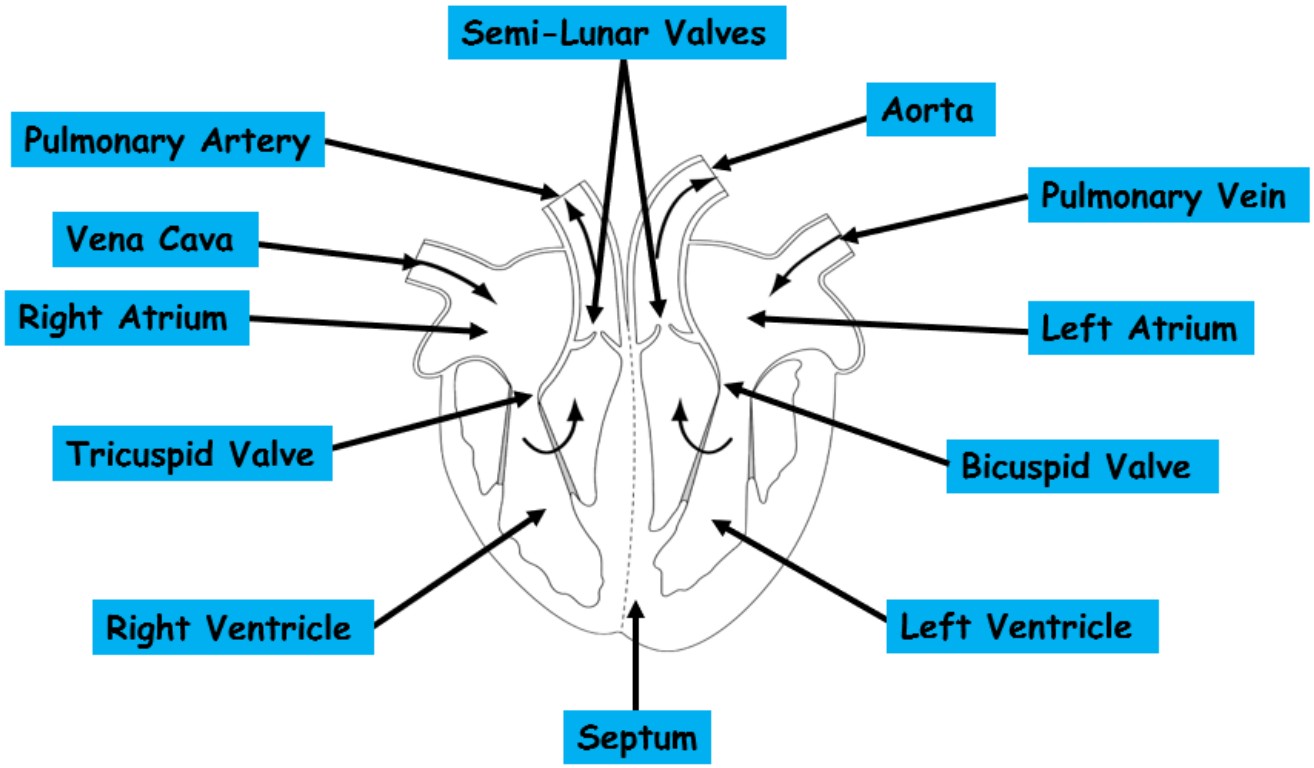
Sporting example

When exercising we need oxygen to be delivered to the working muscles for energy the oxygen is transported in the blood via the blood vessels

When taking part in exercise temperature increase the blood vessels near the skin will vasodilate to let heat radiate away from the skin

When we exercise carbon-dioxide is produced as a waste product. This needs to be removed. It is removed via the blood and blood vessels

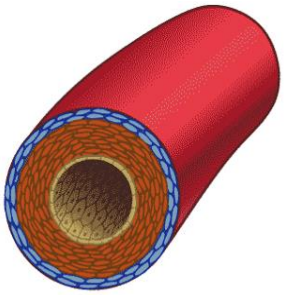
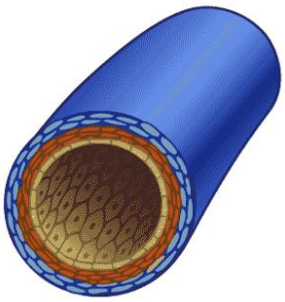
Structure of the heart



Structure	Function
Vena Cava	Transports deoxygenated blood from the body to the right Atrium
Right Atrium	Top chamber of the heart that holds deoxygenated blood
Tricuspid Valve	Stops the blood flowing back into the right atrium
Right Ventricle	Bottom chamber that holds deoxygenated blood
Semi-Lunar Valve	Stops the blood flowing back into the right ventricle
Pulmonary Artery	Transports deoxygenated blood from the heart to the lungs
Pulmonary Vein	Transports oxygenated blood from the lungs to the heart
Left Atrium	Top chamber of the heart that holds oxygenated blood
Bicuspid Valve	Stops the blood flowing back into the left atrium
Left Ventricle	Bottom chamber that holds oxygenated blood
Semi-lunar Valve	Stops the blood flowing back into the left ventricle
Aorta	Transports oxygenated blood to the rest of the body
Septum	A wall that separates the left from the right side of the heart

Structure of Blood Vessels

We need to know the structure and function of the three types of blood vessels. We also need to know how they are important in terms of oxygenated blood, deoxygenated blood, and their response to physical activity.

Blood Vessel	Structure	Importance During Physical Activity
Artery 	• Thick muscular walls • Thick elastic walls • Small lumen (internal diameter) • Carry blood at high pressure • Cary blood away from the heart • Usually carry oxygenated blood (except the pulmonary artery)	When we exercise blood-pressure increases due to the demand for oxygen from the working muscles. Arteries take the blood to the working muscles. They dilate to allow more blood through
Vein 	• Thin walls • Large lumen (internal diameter) • Carry blood at low pressure • Contain valves • Mainly carry deoxygenated blood (except the pulmonary vein)	When we exercise aerobically the body produces waste products such as carbon dioxide. The blood in the veins take this to the lungs to be exhaled. The valves in the veins prevent the back flow of blood at low pressure
Capillary 	• Very thin walls (one cell thick) • Small lumen (internal diameter) • Link smaller arteries with small veins • Allow gaseous exchange	When we exercise we need to deliver oxygen to the working muscles and remove the waste product, carbon dioxide. Capillaries allow the gaseous exchange at the lungs and the muscles

Redistribution of Blood Flow

Vascular Shunting: When we exercise blood is redistributed. The working muscles need more oxygen than other inactive areas of the body such as the stomach. Blood is diverted away from inactive areas to the working muscles. This is called vascular shunting.

Vasoconstriction

- Vasoconstriction means that the blood vessels are constricted to make them smaller
- When we exercise chemical changes signal the nervous system to **constrict** blood vessels to **inactive** areas reducing blood flow (for example the digestive system)

Vasodilation

- Vasodilation means that the blood vessels are dilated to make them bigger
- When we exercise chemical changes signal the nervous system to dilate blood vessels that supply active areas. This means more blood is delivered to working muscles, allowing them more oxygen

Function of Blood

Blood has four components that each play a role in physical activity

Plasma:

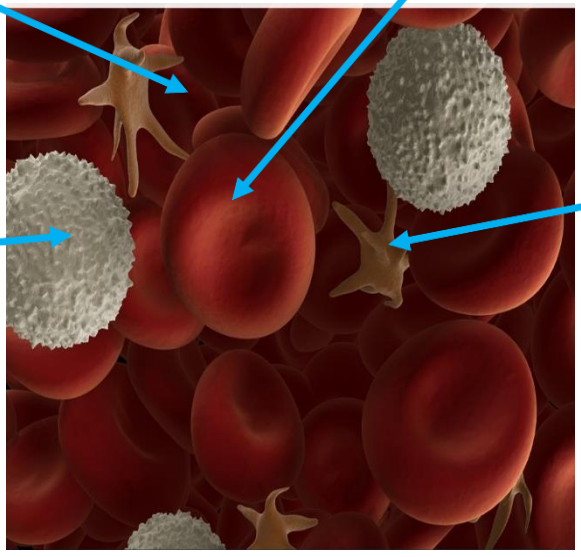
Plasma is the liquid part of the blood it acts as a transport system that transports the blood cells, platelets and nutrients to different parts of the body

Red Blood Cells:

Red blood cells carry oxygen and carbon dioxide. The oxygen binds with haemoglobin in the blood. It is then transported to the working muscles by the plasma The waste product carbon dioxide is also transported by the red blood cells, it is also carried by the plasma

White Blood Cells:

White blood cells fight infection and disease. When playing sport they prevent infection if we get cut or scratched. They also keep us healthy so we are fit to train and take part in physical activity



Platelets:

Platelets help prevent bleeding by clotting (sticking together) and forming a plug. This is important to allow performers such as boxers to stop the bleeding if they get a cut, allowing them to continue performing

Respiratory System

Topic Number	Description	Pre Revision	Post revision
1.2.6	**Composition of inhaled and exhaled air** • Nitrogen • Carbon dioxide • Oxygen Explain their impact on physical activity and sport on this composition		
1.2.7	**Vital capacity and tidal volume** Explain the change in tidal volume due to physical activity and sport, and the reasons that make the change in tidal volume necessary		
1.2.8	**Location of the main components of respiratory system:** • Lungs • Bronchi • Bronchioles • Alveoli • diaphragm Explain their role in movement of oxygen and carbon dioxide into and out of the body		
1.2.9	**Structure of alveoli** to enable gas exchange and the process of gas exchange to meet the demands of varying intensities of exercise (aerobic and anaerobic)		
1.2.10	How the cardiovascular and respiratory systems work together to allow participation in physical activity and sport		

Areas of Strength	
Areas to revise	

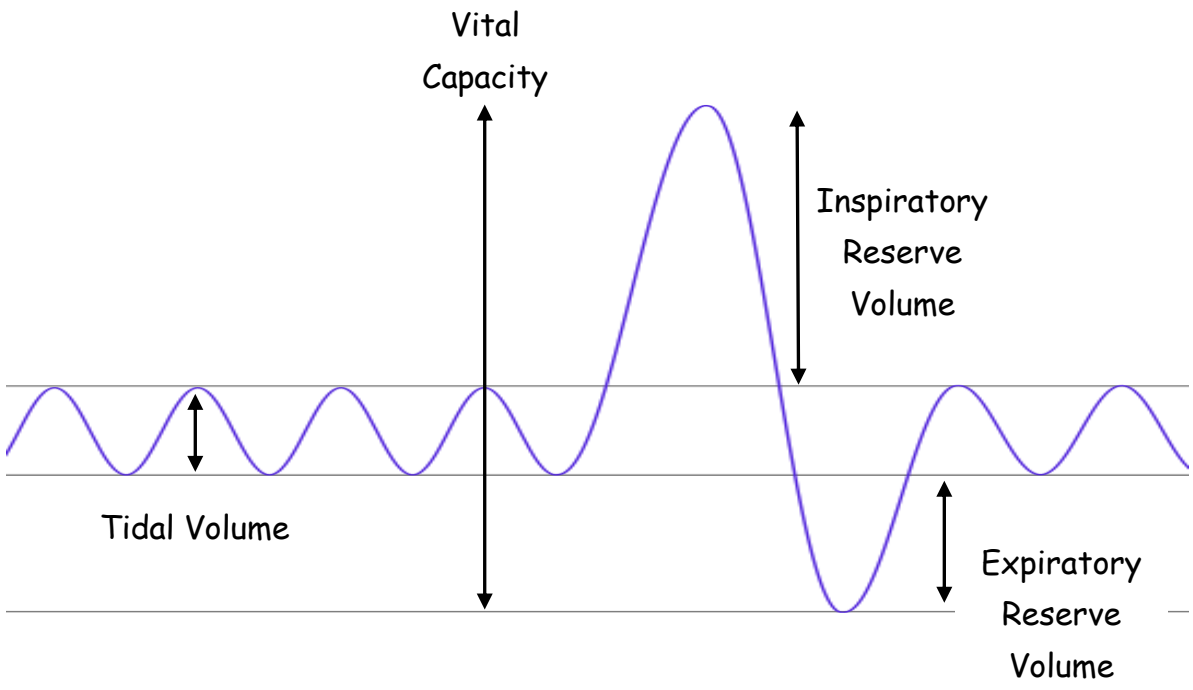
Composition of air

Inspired Air		Expired Air	
Nitrogen	78%	Nitrogen	78%
Oxygen	21%	Oxygen	16%
Carbon Dioxide	0.04%	Carbon Dioxide	4%

The differences between inhaled and exhaled air

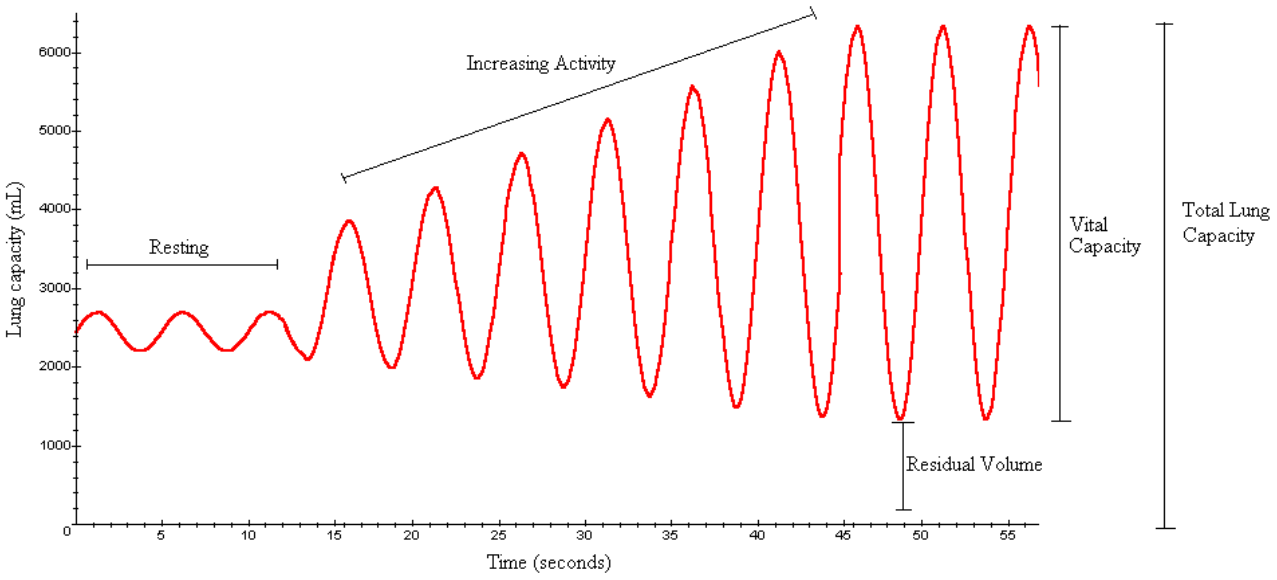
Gas	Explanation
Oxygen	**Oxygen levels go down in expired air** Oxygen is used for energy production and for recovery, so there is less oxygen to breathe out
Carbon Dioxide	**Carbon dioxide increase in expired air** Carbon dioxide is a waste product of energy production, so there is more carbon dioxide to breath out
Nitrogen	**Nitrogen levels stay the same** The body does not use nitrogen for energy production and is not produced by the body.

Lung Volumes



Lung volume	Explanation
Tidal Volume	The amount of air inspired (inhaled) or expired (exhaled) in a normal breath. Tidal volume at rest is 0.5 litres.
Vital capacity	The maximum amount of air the lungs can expire (breathe out) after the maximum inspiration (breathe in). Vital capacity is approximately 2.5 litres.
Expiratory Reserve Volume	The maximum volume of air that can be exhaled.
Inspiratory Reserve Volume	The maximum volume of air that can be inhaled.

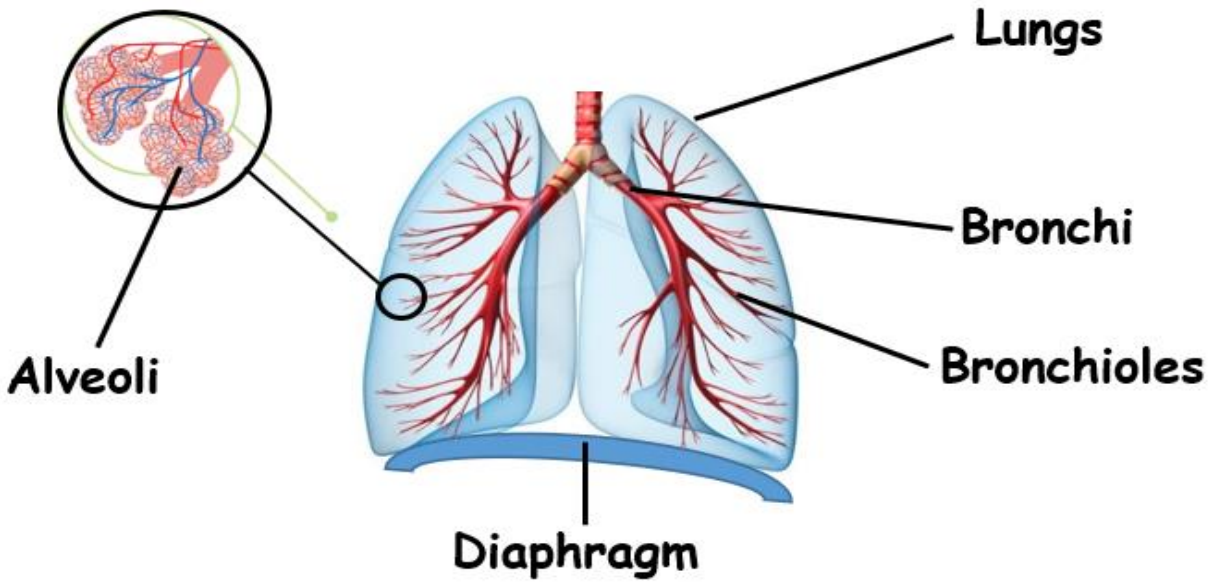
Tidal volume during exercise



Changes to tidal volume during exercise

- When our body is at rest, breathing is low and shallow
- During exercise the demand for oxygen increases, oxygen is needed for energy production
- Breathing increases in depth and rate to meet the demand of oxygen
- Carbon dioxide is a by-product of aerobic energy production
- We need to remove the carbon dioxide and breathe it out
- To allow al of the above to happen tidal volume increases

The respiratory system



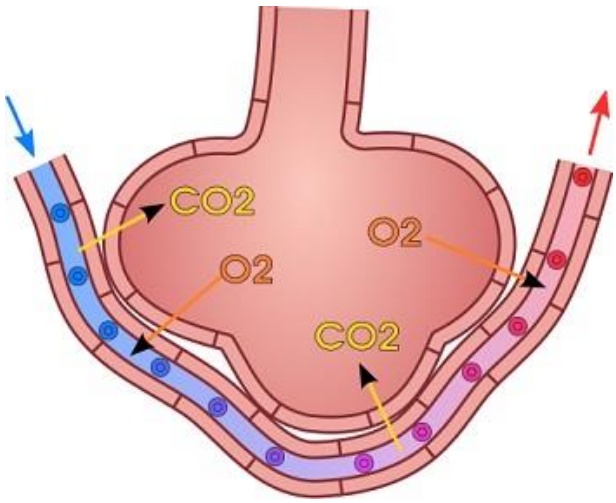
Structure	Explanation
Lungs	• There are two lungs (left and right) • They allow air to be moved in and out of the body • Air enters the body through inspiration • Air leaves the body through expiration
Bronchi	• Air travels to each lung via a bronchus • Bronchi is the term for both the left and right bronchus • The passage of air gets smaller and smaller
Bronchioles	• The smaller airways that branch off the bronchi are called bronchioles • Bronchioles branch out throughout the lungs and carry the air from the bronchi to the alveoli
Alveoli	• Alveoli are tiny air sacs • They are attached to the bronchioles • The exchange of oxygen and carbon dioxide occurs at the alveoli
Diaphragm	• The diaphragm is a domed sheet of muscle that helps up breathe in and out **Inspiration** – the diaphragm contracts and flattens to make more space in the chest so the lungs can expand to pull air in **Expiration** – the diaphragm relaxes and returns to a dome shape, making the chest cavity smaller. This helps force air out of the lungs

The alveoli and gas exchange

Gas exchange happens between

- Alveoli and the capillaries
- Capillaries and the muscle tissue

Structure of alveoli	• Very tiny air sacs • Very thin walls • Surrounded by capillaries
Gas exchange	Gases move from areas of high concentration to areas of low concentration. If there is more oxygen in the alveoli than the capillaries oxygen will move into the capillaries
Gas exchange alveoli to capillaries	• Alveoli have a high pressure of oxygen • Capillaries surrounding the alveoli = low pressure of oxygen • Movement of oxygen from high pressure to low pressure through the thin walls of the capillaries • Capillaries gain oxygen from the alveoli
Gas exchange Capillaries to alveoli	• The reverse happens with carbon dioxide • Capillaries surrounding the alveoli have a high pressure of carbon dioxide • Alveoli have a low pressure of carbon dioxide • Movement of carbon dioxide from high tom low pressure • Carbon dioxide moves from the blood (capillaries) into the alveoli to be breathed out



Apply your Knowledge

- Skeletal system
- Muscular system
- Cardiovascular system
- Respiratory system

1. Name three functions of the skeleton and explain how each function helps the performance of Anthony? (9 marks)

Function 1: _____

Helps performance: _____

_____

Function 2: _____

Helps performance: _____

_____

Function 3: _____

Helps performance: _____

_____

2. Name a short bone and explain its importance in a game of basketball? (2 marks)

_____

_____

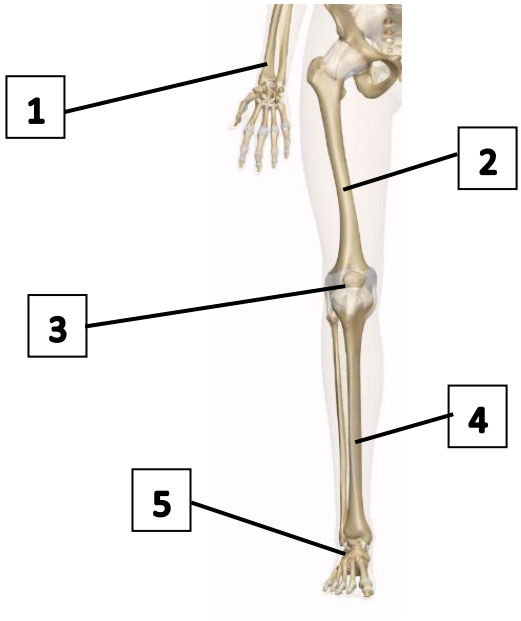
_____

_____

_____

3. Label the following bones? (5 marks)

1. _____
2. _____
3. _____
4. _____
5. _____



4. Draw a line matching the classification of joint and an example of where the joint can be found in the body (4 marks)

Classification of joint		Example in the body
Ball and socket		Knee
Condyloid		Shoulder
Hinge		Wrist
Pivot		Neck

5. Explain the role of ligaments during a hockey match, explain how they can affect performance? (5 marks)

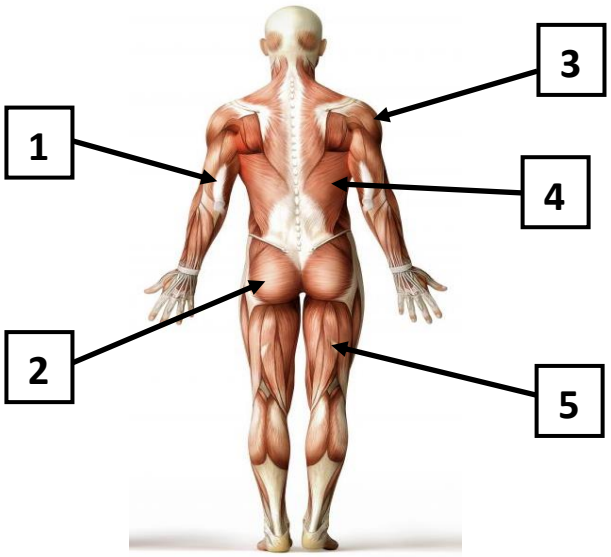
_____
_____
_____
_____
_____
_____
_____

6. Name an involuntary muscle found in the body and give two characteristics of this type of muscle? (3 marks)

_____

_____

7. Label the following muscles? (5 marks)



1

2

3

4

5

8. Choose and antagonistic pair of muscles and explain how they contract when kicking a ball? (5 marks)

_____

_____

_____

_____

_____

_____

_____

_____

9. What type of muscle fibre is the most important to a marathon runner, explain your answer? (4 marks)

_____

_____

_____

_____

_____

_____

_____

10. What three components that make up the cardiovascular system? (1 mark)

_____

11. Explain how the body regulates temperature through vasoconstriction and vasodilation? (4 marks)

_____

_____

_____

_____

_____

_____

_____

_____

_____

12. Label the heart? (4 mark)

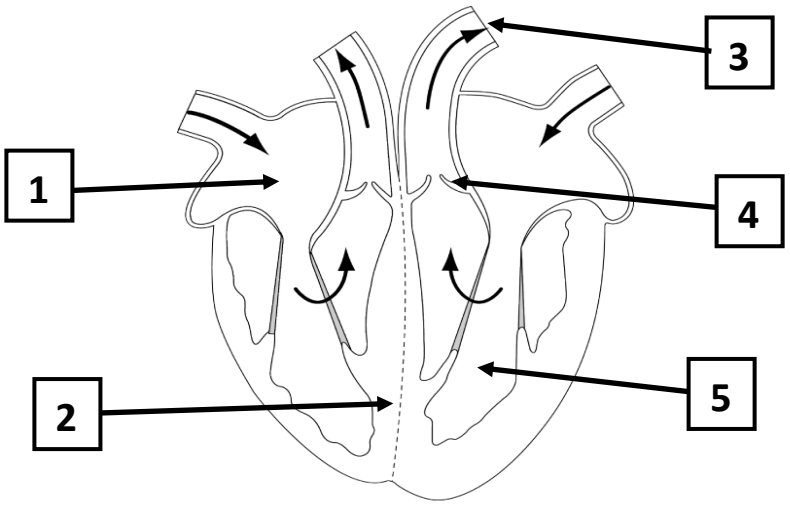
1

2

3

4

5



13. Illustrate the difference between arteries and veins below? (5 marks)

14. Using the words below, complete the statements? (2 marks)

Unchanged	Equal
Greater	Lower

When exercising blood flow to stomach is _____ than when we are resting

When exercising blood flow to the working muscles is _____ than when we are resting

15. Explain vascular shunting? (2 marks)

_____

_____

_____

16. Explain the importance of platelets when talking part in physical activity? (3 marks)

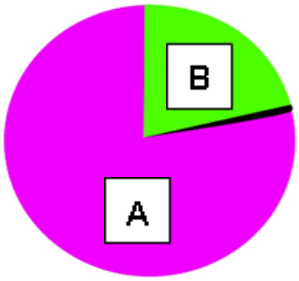
_____

_____

17. The pie chart below represents the 3 main gases in exhaled air, identify the gases A & B? (2 marks)

A = _____

B = _____



18. Explain the difference in the percentage of carbon dioxide in inhaled and exhaled air? (3 marks)

Inhaled Carbon Dioxide	Exhaled Carbon Dioxide
0.04%	4%

_____

_____

_____

19. When we exercise tidal volume increases explain why it increases? (4 marks)

_____

_____

_____

_____

_____

_____

_____

20. Draw and label the following components of the respiratory system? (5 marks)

- Lungs
- Bronchi
- Bronchioles
- Alveoli
- Diaphragm

21. Explain how gas exchanges from the muscle tissue to the alveoli (4 marks)

_____

_____

_____

_____

_____

_____

_____

Self-Assessment

- You are now going to use your revision notes to mark your work
- Fill in any incorrect answers in Green pen
- Give yourself a score

/80

Post *it*

Write a short post it note about your knowledge at this stage of component 1 and what you need to do to improve!