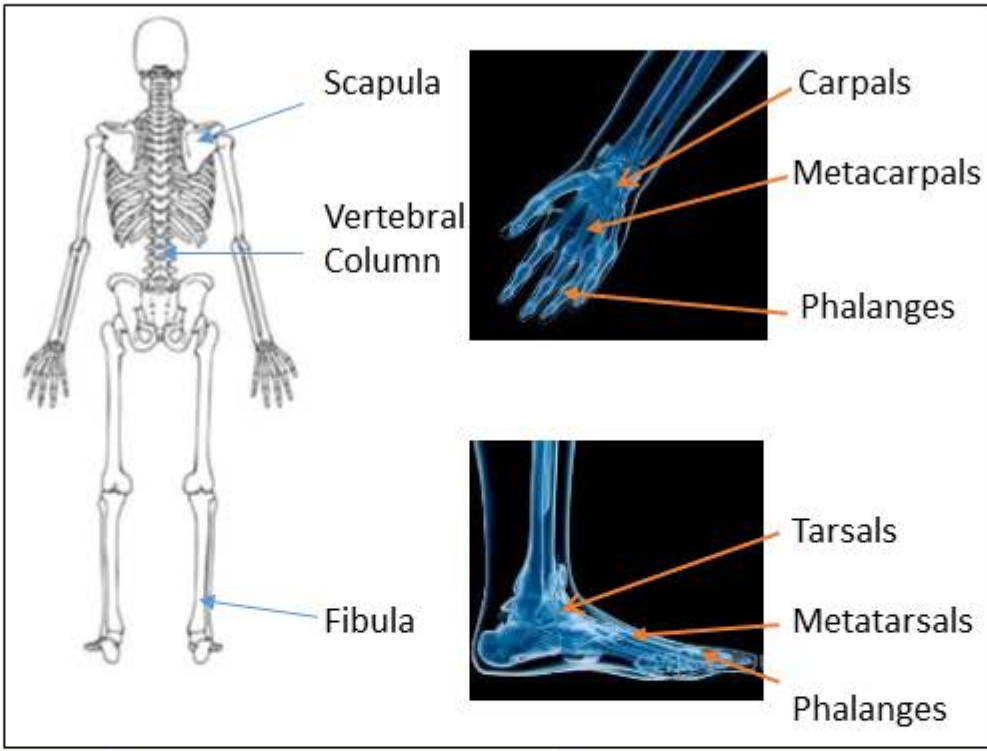
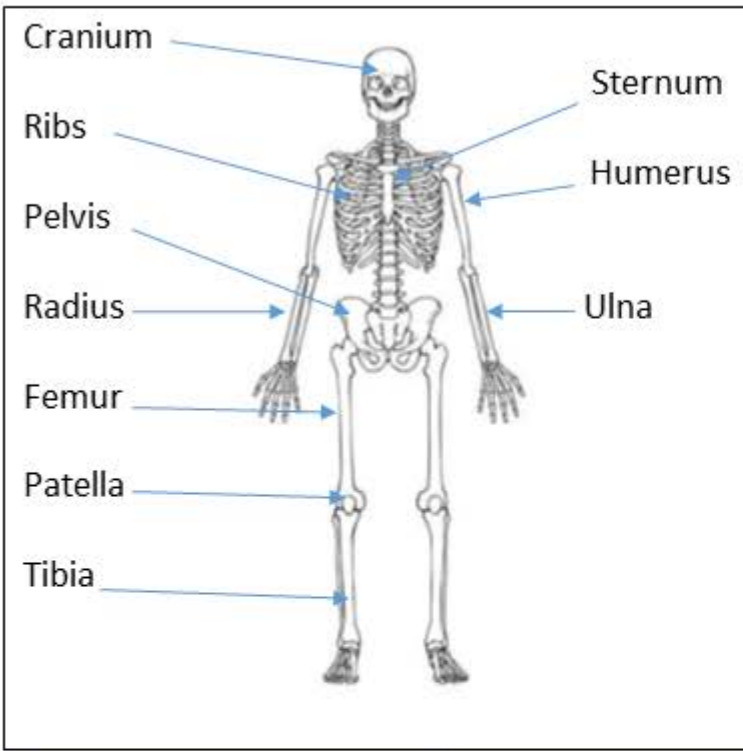


TURTON SCHOOL YEAR 9 PE KNOWLEDGE ORGANISER – TOPIC 1: THE SKELETAL SYSTEM



Joints

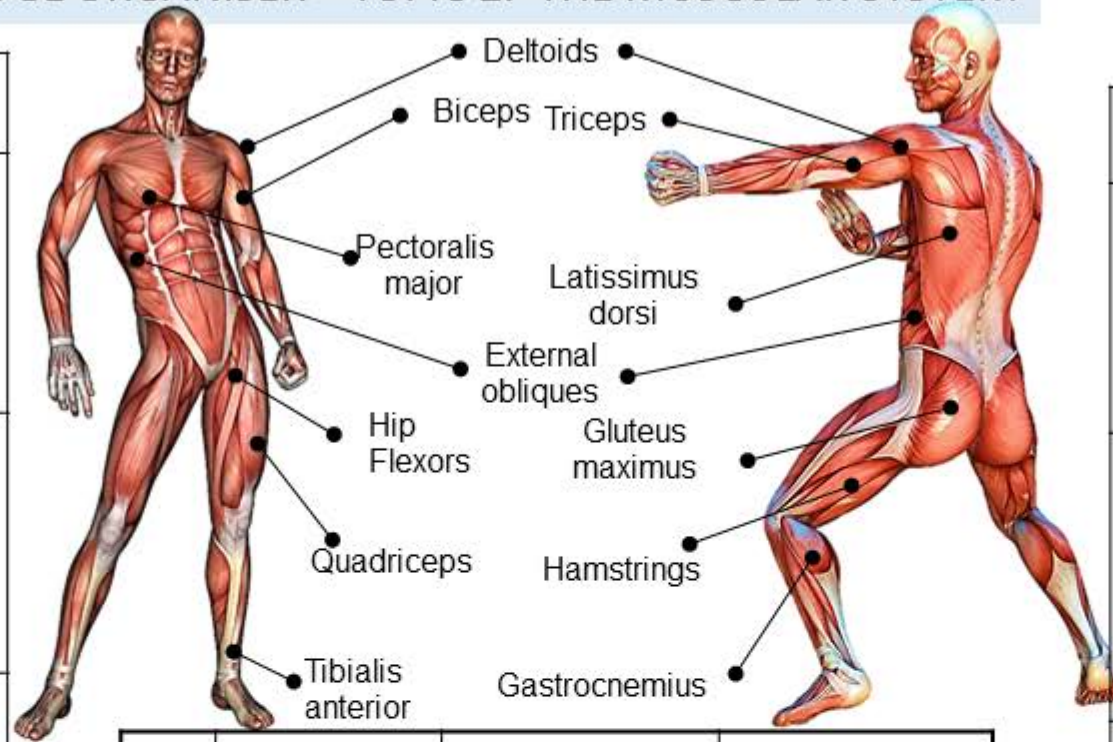
Where two or more bones meet

Ball and socket joint	Hinge joint
<p>Movements</p> <ul style="list-style-type: none"> Flexion Extension Abduction Abduction Circumduction Rotation 	<p>Movements</p> <ul style="list-style-type: none"> Flexion Extension

Long	Short	Flat	Irregular
<p>Clear shaft region to the bone. <i>E.g. femur, humerus, ulna, metatarsals and phalanges</i></p>	<p>Light, small and very strong. <i>E.g. carpals and tarsals</i></p>	<p>Broad surface area for muscle attachment. <i>E.g. Cranium, pelvis and scapula</i></p>	<p>Assist the functioning of certain joints. <i>E.g. Vertebrae</i></p>

Sporting Example	Sporting Example

TURTON SCHOOL YR9 PE KNOWLEDGE ORGANISER – TOPIC 2: THE MUSCULAR SYSTEM



Muscle Types	Characteristics
Cardiac	<ol style="list-style-type: none"> 1. Found only in the walls of the heart 2. Specialised type of involuntary muscle 3. Send signals from the brain to heart to regulate heart rate
Involuntary	<ol style="list-style-type: none"> 1. Found in organs of the digestive, circulatory and urinary systems 2. Found in blood vessels – contract and relax to distribute blood where it is needed in the body
Voluntary	<ol style="list-style-type: none"> 1. Attached to the skeleton by tendons 2. Muscle fibres that are long and thin contract and pull the skeleton to cause movement

Muscle Fibres	Characteristics
Type I	<ol style="list-style-type: none"> 1. Darker in colour because they contain a lot of myoglobin 2. Good supply of oxygen 3. Contract slowly so can work for longer periods of time
Type IIa	<ol style="list-style-type: none"> 1. Activities lasting 30 seconds to 2 minutes, e.g. 800m 2. Lighter in colour because they don't use as much oxygen 3. Contract quickly and tire easily
Type IIx	<ol style="list-style-type: none"> 1. 100m 2. Explosive fibres 3. Fatigue very quickly

Joint	Movement	Agonist	Antagonist
Hip	Flexion	Hip flexors	Gluteus maximus
	Extension	Gluteus maximus	Hip flexors
Knee	Flexion	Hamstrings	Quadriceps
	Extension	Quadriceps	Hamstrings
Ankle	Plantar flexion	Gastrocnemius	Tibialis anterior
	Dorsiflexion	Tibialis anterior	Gastrocnemius
Elbow	Flexion	Biceps	Triceps
	Extension	Triceps	Biceps

Antagonistic Muscle Pairs

Definition: Muscles work in pairs- when one contracts the other relaxes

- Agonist- muscle that contracts to cause movement
- Antagonist- muscle that relaxes

Flexion	<ul style="list-style-type: none"> • Decreasing the angle at a joint
Extension	<ul style="list-style-type: none"> • Increasing angle at a joint
Abduction	<ul style="list-style-type: none"> • Movement away from the body
Adduction	<ul style="list-style-type: none"> • Movement towards the body
Rotation	<ul style="list-style-type: none"> • Circular movement at a joint



Functions of the cardiovascular system

- 1) It transports oxygen, carbon dioxide and nutrients
- 2) It helps blood to clot
- 3) It controls the body's temperature

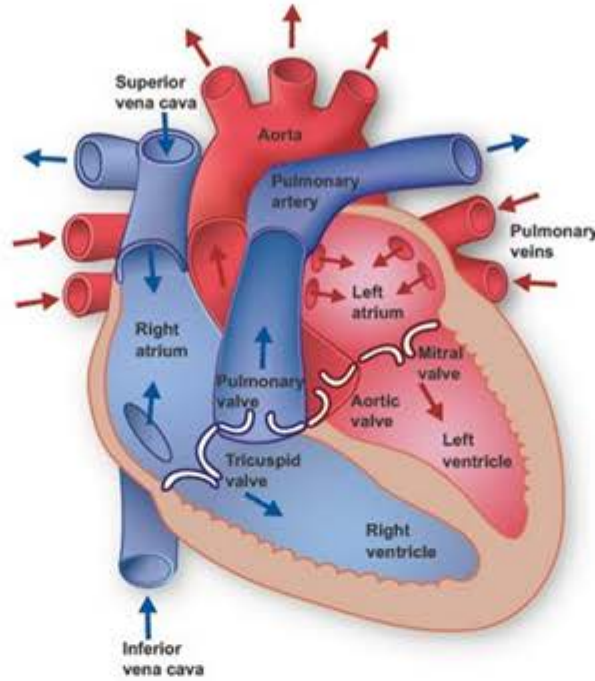
Transportation of blood

The main blood vessels are:

ARTERIES – take blood away from the heart

VEINS – return blood to the heart

CAPILLARIES – Distribute blood within organs



Flow of blood through the heart

Blood enters the right atria from the body through the vena cava

Blood gets pumped down into the right ventricle

Blood gets pumped from the right ventricle to the lungs

Blood enters the left atria from the lungs as oxygenated blood

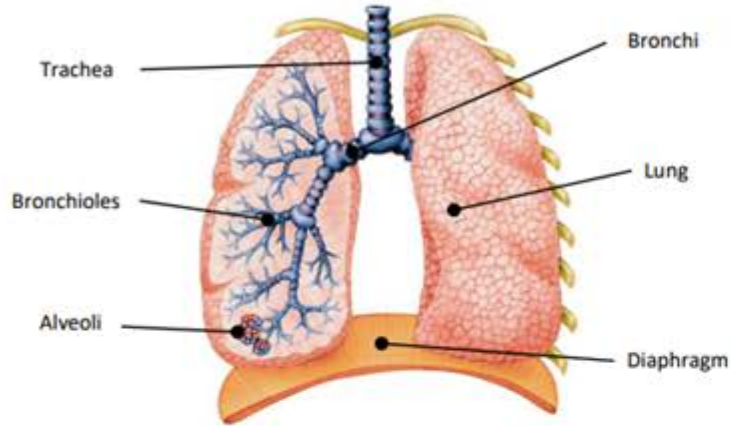
Blood gets pumped down into the left ventricle

Blood gets pumped from the left ventricle to the body via the aorta (largest artery in the body)

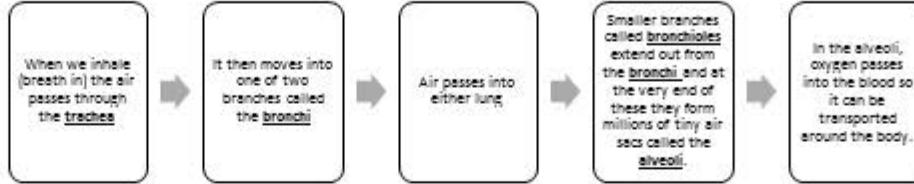
Blood Vessel	Characteristics	Importance in sport
Arteries	Take blood away from the heart Thicker, more elastic walls Carry blood at high pressures	Carries oxygenated blood to muscles that need oxygen to respire/contract
Veins	Return blood to the heart Thinner, less elastic walls Carry blood at lower pressures Contain Valves which prevent the backflow of blood	Bring deoxygenated blood back to the heart ready to be oxygenated
Capillaries	Link arteries and veins Very small Just one cell thick Where gas exchange takes place	This is where oxygen goes through the capillary wall into the muscle tissue whilst carbon dioxide diffuses into the blood.



Structure of the Respiratory System



Pathway of Air



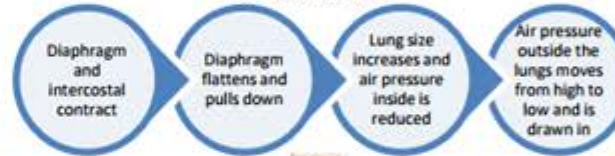
Long Term Benefits of Exercise

- Improved efficiency of the lungs = better oxygen delivery to the working muscles
- Increased number of alveoli/capillaries
- Increased strength of the Diaphragm

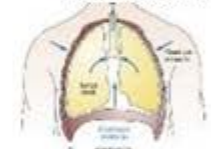
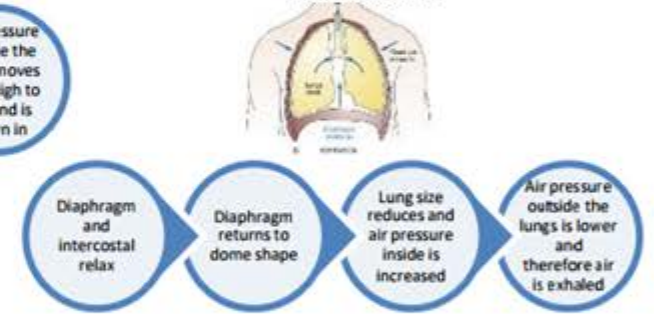
Key Terms

Inhalation	Breathing in
Expiration	Breathing out
Diaphragm	The primary muscle used in the process of inspiration or exhalation. A dome-shaped sheet of muscle that separates the chest from the rest of the body cavity.
Trachea	The tube that takes the air into the chest, also known as the windpipe.
Bronchi	Tube along which air passes from the trachea into the lungs.
Bronchioles	Smaller branches coming from the bronchi.
Alveoli	Tiny sacs at the end of the bronchioles, where gas exchange takes place.
Gaseous exchange	The delivery of oxygen from the lungs to the bloodstream and the removal of carbon dioxide from the tissues.

Inhalation



Exhalation



Gaseous exchange at the alveoli

This is where **oxygen** is diffused into the blood to go to the working muscles and **carbon dioxide** is diffused through the walls of the **alveoli** and is then breathed out. This is called **gaseous exchange**. To make this process as efficient as possible the alveoli have a large surface area. The linings of the alveoli are very thin and work well when they are moist and clean.





<u>Components of fitness</u>	<u>Fitness test</u>
Cardiovascular fitness	<ul style="list-style-type: none"> Cooper 12 minute test (run/swim) Harvard Step Test
Agility	<ul style="list-style-type: none"> Illinois agility run test
Strength	<ul style="list-style-type: none"> Grip dynamometer
Muscular endurance	<ul style="list-style-type: none"> One minute sit-up One minute press-up
Speed	<ul style="list-style-type: none"> 30m sprint
Power	<ul style="list-style-type: none"> Vertical jump
Flexibility	<ul style="list-style-type: none"> Sit and reach

<u>Methods of training</u>	<u>Explanation</u>	<u>Specific components of fitness, physical activity and sport</u>
Continuous	Working for a sustained period of time without rest.	Improves cardiovascular fitness Example: swimming, cycling, running, rowing.
Fartlek	Varying your speed and type of terrain over the run, walk, cycle or ski.	Improves aerobic and anaerobic fitness. Example: running, cycling, skiing.
Circuit	Performing a series of exercises in an order, at specific stations.	Improves: speed, agility, muscular endurance. Example: circuits can be made specific to a sport/activity.
Interval	Alternating between periods of hard exercise and rest.	Improves: speed and muscular endurance.
Weight/resistance	Using weights to provide resistance to the muscles.	Improves: muscular strength, muscular endurance and power.





<u>Principles of training</u>	<u>Explanation</u>
Individual needs	Personal fitness needs
Specificity	Match the needs of the sporting activity
Overtraining	Training more than normal to improve fitness
Progressive overload	Gradually increase the amount of exercise and keep overloading
Reversibility	Any adaptation that takes place as a result of training will be reversed when you stop training
FIIT	Frequency: how often Intensity: how hard Time: how long Type: which methods of training to use









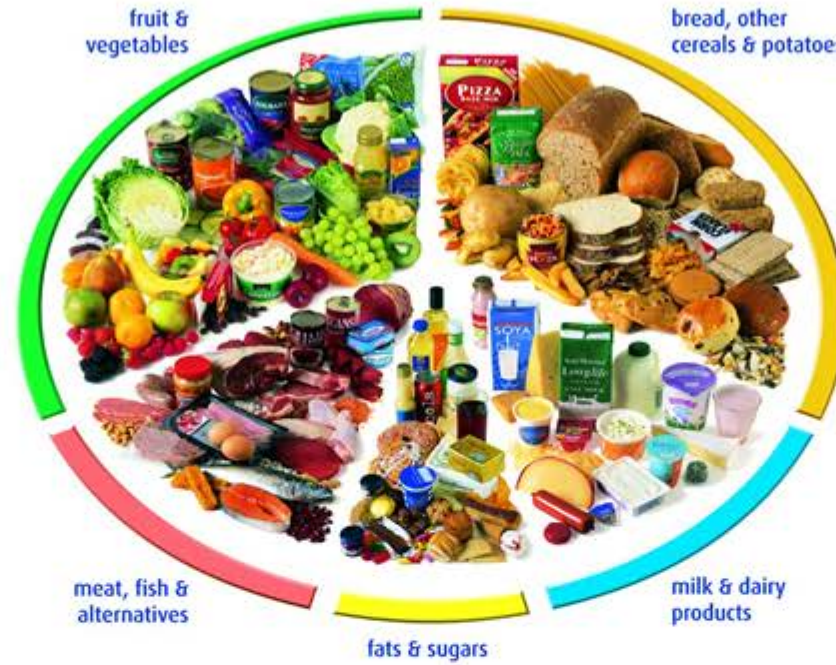
What are drugs?

- Drugs are 'substances that change chemical reactions in the body.'
- Depending on the drug, the effect it has on the body can vary different!

Name of Drug	Effect on performance?	Sporting Example
Anabolic steroids 	Helps athletes to train harder and build muscle mass	Bodybuilders – Bodybuilders are judged on their muscle mass. More muscle = improved performance
Beta blockers 	Reduce heart rate (HR)	Archery / Snooker / Darts – these athletes need to concentrate hard on performing a specific fine skill, so a lower HR aids performance
Diuretics 	Remove fluid from the body and can aid weight loss	Boxing / Jockeys – Need to make weight to fight or race
Narcotic analgesics 	Mask pain caused by injury or fatigue which can make the injury worse	Footballers – may take these to hide the pain of a dead leg to continue playing for the next game



Name of Drug	Effects on performance	Sporting Example
Peptide hormones (eryth EPO) 	Increases red blood cells = more energy	Cyclist – Need to cycle for long periods of time so more energy = improved performance
Growth Hormone (GH) 	Builds muscle	Wrestler – needs lots of muscle to be able to throw/wrestle their opponents
Stimulants 	Makes athletes more alert and masks fatigue (extreme tiredness caused by physical activity) and increases aggression.	Ice Hockey – Contact sport so being alert and aggressive is important to avoid/make tackles and stay safe!
Blood Doping 	Involves injecting blood that has been removed from the body a few days earlier, enabling the blood to carry more oxygen = improves endurance so athletes can train for longer!	Marathon Runner – Need to perform for long periods of time, so an improvement in endurance = improved performance



Components of a balanced diet	<ol style="list-style-type: none"> 1. What is their role? 2. Importance to Sports performer
Carbohydrates	<ol style="list-style-type: none"> 1. Provide us with energy to function 2. Carbohydrates ensure that athletes have enough energy to complete the race/match.
Proteins	<ol style="list-style-type: none"> 1. Muscle growth and repair 2. Will allow a performers muscles to recover from vigorous exercise and grow larger over longer periods of time.
Fats	<ol style="list-style-type: none"> 1. Provide us with energy to function and store energy 2. Allow for performers to perform at a higher intensity for shorter periods of time
Minerals	<ol style="list-style-type: none"> 1. Help your body grow, develop, and stay healthy. 2. Minerals ensure our body can perform at optimal levels and can increase bone strength.

Components of a balanced diet	<ol style="list-style-type: none"> 1. What is their role? 2. Importance to Sports performer
Fibre	<ol style="list-style-type: none"> 1. Helps with our bodies digestive system 2. Slows the emptying of food from our bodies to benefit endurance athletes.
Water	<ol style="list-style-type: none"> 1. Keeps our hydration and concentration levels to an optimum 2. Allows the athlete to perform longer at a more consistent level- particularly in higher endurance events.
Vitamins	<ol style="list-style-type: none"> 1. Aid with our red blood cell production and brain function. 2. Play an important role in the function of our bodies and the protection of our immune system.