

Key Vocabulary – Muscular System

Voluntary Muscle – muscles that are under your conscious control (biceps, quadriceps etc)

Involuntary Muscle – muscles that are not under your control (found in the organs, stomach, intestines)

Cardiac Muscle – Found in the walls of the heart. Not under conscious control.

Tendons – attach muscle to bone

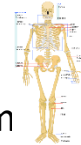
Antagonistic Pairs – a pair of muscles working together at a joint to create movement (one lengthens as the other shortens)

Agonist – a muscle that contracts and is directly responsible for the movement at a joint

Antagonist – a muscle that lengthens to allow movement at a joint.



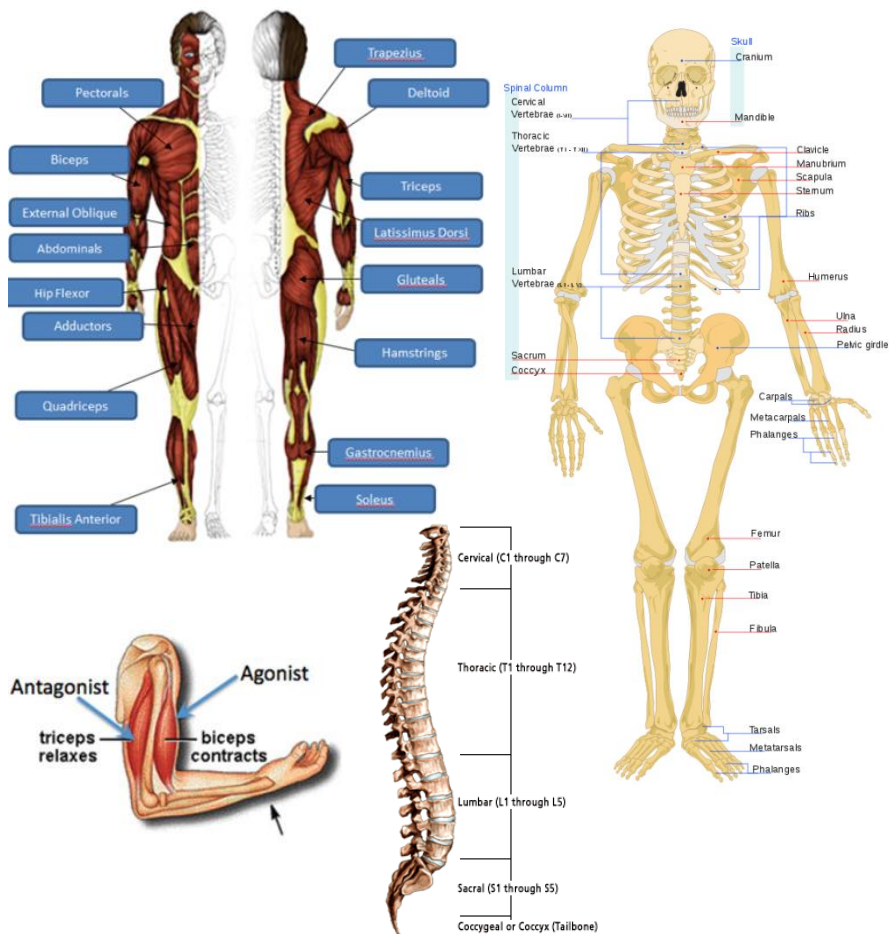
GCSE PE - Edexcel Knowledge Organiser Muscular-Skeletal System



In this topic students will develop knowledge and understanding of the key body systems and how they impact on health, fitness and performance in physical activity and sport through the following content.

1.1 The structure and functions of the musculo-skeletal system

- 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: 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), and their classification and use 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), and 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 and 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
- 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, and their roles when participating in physical activity and sport
- 1.1.8 Location and role of the voluntary muscular system to 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 and 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 – plantar flexion to dorsi flexion; and quadriceps and hamstrings acting at the knee, biceps and triceps acting at the elbow, and 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 and type IIx) and how this impacts 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



Key Vocabulary – Skeletal System

Protection – flat bones protect the vital organs in the body

Movement – long bones make levers and joints which enable us to move

Muscle attachment – Muscles attach to bones by tendons which allows us to move

Blood Cell production – red and white blood cells and platelets are produced in the bone marrow

Mineral storage – calcium and phosphorus are stored in bones

Short bones – weight bearing

Irregular bones – protection and weight bearing

Pivot – a type of joint found at the neck and elbow

Hinge – a joint found at elbow ankle and knee

Ball and Socket – a joint found at the shoulder and hip

Condyloid – a joint found at the wrist

Flexion – lessening of the angle at a joint

Extension – increasing of the angle at a joint

Adduction – moving towards the mid-line of the body

Abduction – moving away from the mid-line of the body

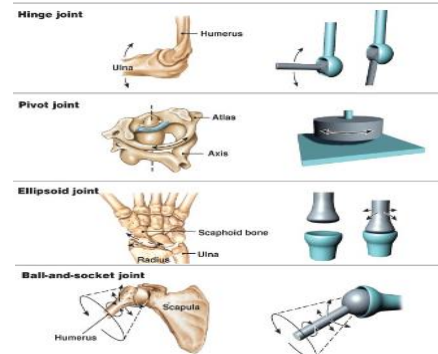
Rotation – moving around a fixed point

Circumduction – conical movement around a joint

Plantar-flexion – pointing the toes

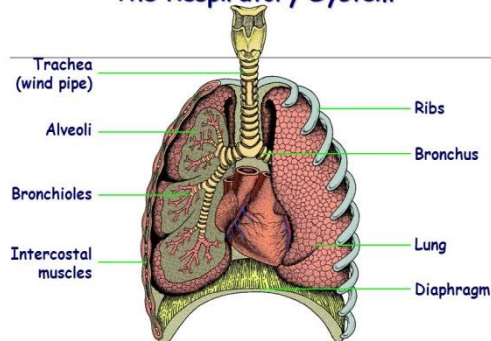
Dorsi-flexion – pulling the toes back towards the shin

Ligament – attaches bone to bone to provide stability

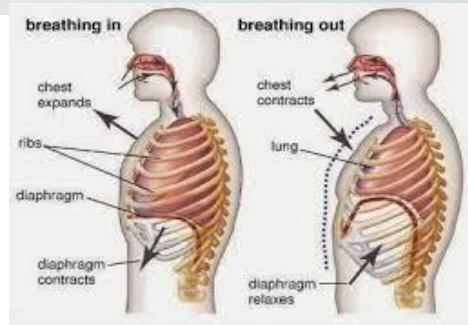
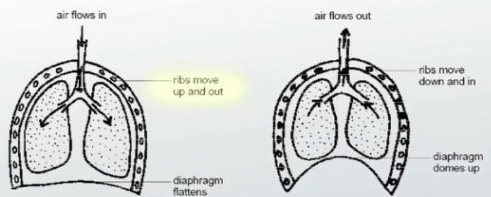


Important Ideas: Respiratory System

The Respiratory System



Important Ideas: Inspiration / Expiration

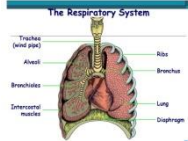


Inspired Air:

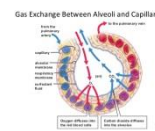
78% Nitrogen / 21% Oxygen
0.04% Carbon Dioxide

Expired Air:

78% Nitrogen / 16% Oxygen
4% Carbon Dioxide



GCSE PE - Edexcel Knowledge Organiser Respiratory System



1.2 The structure and functions of the cardio-respiratory system

1.2.6	Composition of inhaled and exhaled air and the impact of physical activity and sport on this composition
1.2.7	Vital capacity and tidal volume, and 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 main components of respiratory system (lungs, bronchi, bronchioles, alveoli, diaphragm) and the 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

Important Ideas: Energy production

Aerobic respiration for activities that are low or moderate intensity:



Anaerobic respiration for high intensity activities. Can only provide energy for a short time:



After anaerobic respiration the performer experiences 'oxygen debt' and needs to breathe faster and deeper in order to break down the lactic acid

Important Ideas: Aerobic/Anaerobic Exercise Continuum

Marathon > Rowing > Hockey Match > 400m > 100m
(Oxygen Debt)

Aerobic-----Anaerobic

Deoxygenated blood (low in O₂ / high in CO₂) is pumped from the heart to the lungs. The capillaries have very thin walls, so CO₂ can diffuse through into the alveoli and be exhaled. Oxygen diffuses through from the alveoli in to the blood and returns to the heart to be pumped around the body.

Key Vocabulary – Respiratory System

Trachea – air passes through the nose or mouth into the trachea

Bronchi – the trachea splits into 2 tubes called the bronchi, one goes to each lung

Bronchioles – each bronchus splits into smaller tubes called bronchioles

Alveoli – at the end of each bronchiole are small bags called alveoli, this is where gas exchange happens

Diaphragm – a sheet of muscle that separates the chest cavity

Intercostal muscles – muscles between the ribs that help to lift the ribs and increase the size

Inspiration – breathing in

Expiration – breathing out

Tidal Volume – the amount of air inspired and expired during normal breathing

Vital Capacity – the greatest amount of air that you can exhale from the lungs after the biggest possible inhalation

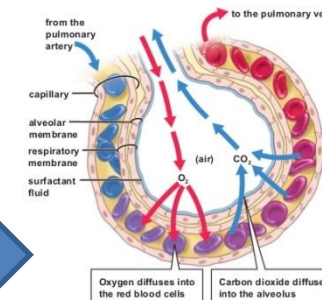
Aerobic Respiration – The process of releasing energy from glucose, using oxygen

Anaerobic Respiration – the process of getting energy without oxygen, produces lactic acid as a by-product

Oxygen Debt – The amount of oxygen needed at the end of physical activity to break down lactic acid. Oxygen debt is repaid with deep, gasping breaths when the activity ends.

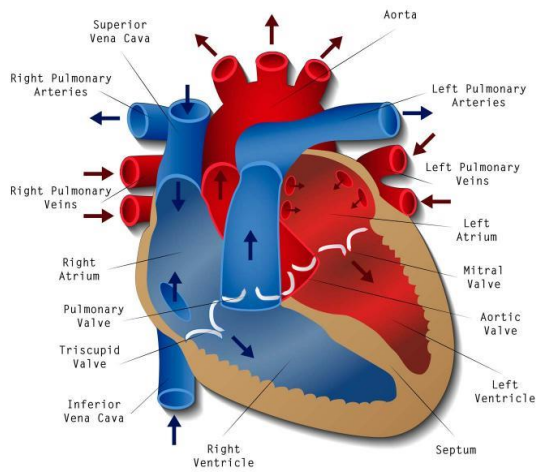
Gaseous Exchange - the process by which oxygen diffuses from the air in the alveoli into the blood while carbon dioxide moves from the blood into the alveoli

Gas Exchange Between Alveoli and Capillaries



Oxygen diffuses into the red blood cells
Carbon dioxide diffuses into the alveolus

Diagram of human heart



GCSE PE - Edexcel Knowledge Organiser Cardio-vascular System

1.2 The structure and functions of the cardio-respiratory system

- | | |
|-------|---|
| 1.2.1 | Functions of the cardiovascular system 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 and semi-lunar valves, aorta, vena cava, pulmonary artery, pulmonary vein, and their role in maintaining blood circulation during performance in physical activity and sport |
| 1.2.3 | Structure of arteries, capillaries and veins and how this relates to 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 | 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 red and white blood cells, platelets and plasma for physical activity and sport |

Gas Exchange Between Alveoli and Capillaries

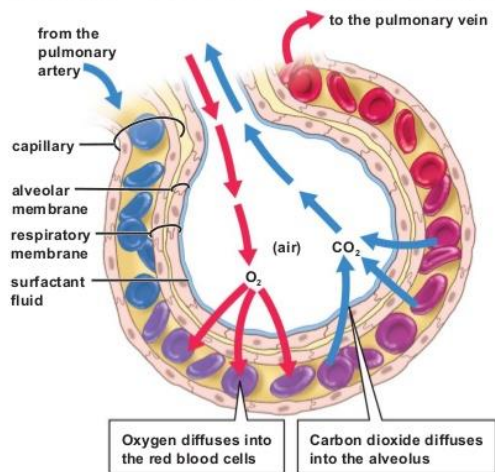


Fig. 33-9

Deoxygenated blood (low in O₂ / high in CO₂) is pumped from the heart to the lungs. The capillaries have very thin walls, so CO₂ can diffuse through into the alveoli and be exhaled. Oxygen diffuses through from the alveoli in to the blood and returns to the heart to be pumped around the body.

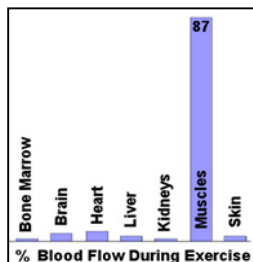
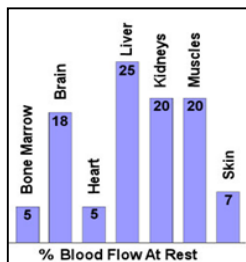
Key Vocabulary - Cardiovascular System

- Cardio** – Heart
- Vascular** – blood vessels (arteries, veins, capillaries)
- Arteries** – Carry blood away from the heart, thick wall, high blood pressure, wide lumen
- Veins** – Carry blood back to the heart, narrow lumen, valves, low blood pressure
- Capillaries** – very thin walls (one cell thick), very narrow lumen
- Lumen** – the space inside a blood vessel that blood travels through
- Haemoglobin** – the oxygen carrying part of red blood cells
- Anaemia** – low red blood cell count
- White blood cells** – destroy pathogens which cause illness
- Platelets** – formed in bone marrow, block cuts in the skin by clotting
- Plasma** – straw coloured liquid in the blood which carries minerals, antibodies and waste products
- Atria** – upper chambers of the heart
- Ventricle** – lower chambers of the heart
- Septum** – divides the heart preventing oxygenated and deoxygenated blood from mixing
- Vena Cava** – deoxygenated blood enters the heart through this valve
- Aorta** – Carries oxygenated blood away from the heart to the body
- Vascular Shunt** – restricting blood flow to certain parts of the body during exercise and increasing blood flow to where it is needed (muscles)
- Vasodilation** – increasing the volume of the capillaries to increase blood flow
- Vasoconstriction** – decreasing the volume of the capillaries to restrict blood flow
- Gaseous Exchange** – the process by which oxygen diffuses from the air in the alveoli into the blood while carbon dioxide moves from the blood into the alveoli

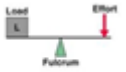
Important Ideas:- Vascular Shunting

When you start to exercise, muscles need more oxygen to help you move. Your heart beats faster and blood vessels that take blood to non-active areas constrict, which stops as much blood flowing to them. This extra blood is redirected to the working muscles because the blood vessels that lead to the muscles dilate and increase blood flow – this is called **Vascular Shunting**.

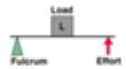
The amount of blood supplied to working muscles depends on the level of intensity that the performer is working at. More blood is supplied to muscles when the performer is working harder.




Important Ideas:

 The **fulcrum** is in the middle
The **effort** (force) is on one side of the fulcrum
The **load** is on the other side of the lever

(a) First-class lever

 The **fulcrum** is at one end of the lever
The **effort** is furthest away from the fulcrum
The **load** is between the **effort** and the **fulcrum**

(b) Second-class lever

 The **fulcrum** is at one end of the lever
The **effort** is between the **fulcrum** and the **load**
The **load** is at the far end of the lever

(c) Third-class lever

Important Vocabulary

Fulcrum – (or pivot) is the point around which the lever rotates – (in your body this will be a joint)

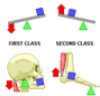
Effort – the force that is applied by the user in the lever system – (in your body, this will be by muscles)

Load – the force that is applied by the lever system – (in sport, this is the item you want to move)

Important Understanding:

Mechanical advantage

- The **effort** required for movement is less than the **load**
- This is true for 1st and 2nd class levers

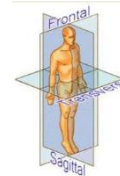


Mechanical disadvantage

- The **effort** required for movement is greater than the **load**
- This is true for 3rd class levers



GCSE PE - Edexcel Knowledge Organiser Movement Analysis



In this topic students will develop knowledge and understanding of the basic principles of movement and their effect on performance in physical activity and sport through the following content.

2.1 Lever systems, examples of their use in activity and the mechanical advantage they provide in movement

2.1.1 First, second and third class levers and their use in physical activity and sport

2.1.2 Mechanical advantage and disadvantage (in relation to loads, efforts and range of movement) of the body's lever systems and the impact on sporting performance

2.2 Planes and axes of movement

2.2.1 Movement patterns using body planes and axes: sagittal, frontal and transverse plane and frontal, sagittal, vertical axes applied to physical activities and sporting actions

2.2.2 Movement in the sagittal plane about the frontal axis when performing front and back tucked or piked somersaults

2.2.3 Movement in the frontal plane about the sagittal axis when performing cartwheels

2.2.4 Movement in the transverse plane about the vertical axis when performing a full twist jump in trampolining

Sporting examples:

You need to be able to identify which plane of movement a body, or body part is moving in.

You also need to be able to identify which axes of rotation the body, or body part, is rotating about.



Full twist jump

Transverse plane (rotation)
Vertical axis



Somersault

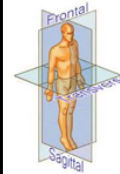
Sagittal Plane (forwards)
Frontal axis



Cartwheel

Frontal Plane (sideways)
Sagittal axis

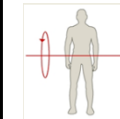
Important Ideas:



➤ **Frontal** plane – splits the body from top to bottom giving front and back sections

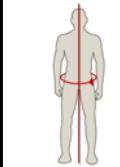
➤ **Transverse** (horizontal) plane – splits the body across the middle giving top (superior) and bottom (inferior) sections

➤ **Sagittal** plane – divides the body from top to bottom giving left and right sections



The **frontal** axis goes from side to side through your middle

This is the axis that you rotate around when doing a forward or backwards somersault (table football)



The **vertical** axis goes from top to bottom through your head

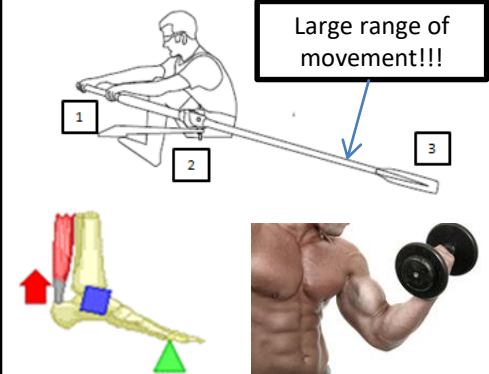
This is the axis that you twist around when doing a 360 jump




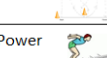
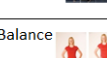





The **sagittal** axis goes from front to back through your middle

This is the axis you rotate around when you perform a cartwheel

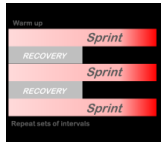
Identify the key components and lever systems



Fitness Component	Name of Test	Protocol – How to carry it out
Speed 	30m sprint test	Run 30m as fast as you can
Co-ordination 	Rebound catch	Stand 1m away from a wall. Throw a tennis ball one-handed against the wall and catch the rebound with your other hand. As many as you can in 30 secs
Reaction Time 	Ruler Drop	Have a partner hold a 30cm ruler in front of you. Have your thumb and index finger either side of the 0cm mark. When your partner drops the ruler, pinch the ruler and see how far it has dropped.
Agility 	Illinois Agility Run	Start lying on your back. Stand, run to far cone (10m) and back, then zig-zag through 4 cones (3.3m apart and back, then 10m and back.
Power 	Standing Long Jump Sergeant Jump	Stand with both feet together and jump as far forward as you can. Reach up and mark the wall with chalk. Jump as high as you can and mark the wall again. Measure the distance between the marks
Balance 	Standing Stork Test	Stand on one foot. Place your other foot against your knee. Close your eyes. Stand for as long as you can.

Fitness Component	Name of Test	Protocol – How to carry it out
Muscular Endurance 	30sec sit ups 30secs press ups	Do as many sit ups as you can in 30s Do as many press ups as you can in 30s
Muscular Strength 	Hand Grip Dynamometer	Squeeze the grip as tightly as you can and record your score. Re-set and repeat with your other hand.
Body Composition 	Skin fold Callipers	Pinch the skin on top of your bicep and grip it with the callipers. Read of how many mm of skin you grab. Repeat at <u>tricep</u> , sub-scapular and hip (supra-iliac).
Cardiovascular Fitness 	Multi-stage fitness test 'bleep test'	Start at the triple bleep. Run 20m to arrive at the line when the 'bleep' sounds again.
Flexibility 	Sit and reach test	Place your feet against a board. Keeping your legs straight, reach towards your toes with both hands. Record your score.

GCSE PE - Edexcel Knowledge Organiser Physical Training



3.1 The relationship between health and fitness and the role that exercise plays in both	3.1.1	Definitions of fitness, health, exercise and performance and the relationship between them
	3.2 The components of fitness, benefits for sport and how fitness is measured and improved	3.2.1
3.3 The principles of training and their application to personal exercise/ training programmes	3.2.2	Fitness tests: the value of fitness testing, the purpose of specific fitness tests, the test protocols, the selection of the appropriate fitness test for components of fitness and the rationale for selection
	3.2.3	Collection and interpretation of data from fitness test results and analysis and evaluation of these against normative data tables
	3.2.4	Fitness tests for specific components of fitness: cardiovascular fitness – Cooper 12 minute tests (run, swim), Harvard Step Test, strength – grip dynamometer, muscular endurance – one-minute sit-up, one-minute press-up, speed – 30m sprint, power – vertical jump, flexibility – sit and reach
	3.2.5	How fitness is improved – see section 3.3.1–3.3.3
	3.3.1	Planning training using the principles of training: individual needs, specificity, progressive overload, FITT (frequency, intensity, time, type), overtraining, reversibility, thresholds of training (aerobic target zone: 60–80% and anaerobic target zone: 80%–90% calculated using Karvonen formula)
	3.3.2	Factors to consider when deciding the most appropriate training methods and training intensities for different physical activities and sports (fitness/sport requirements, facilities available, current level of fitness)
	3.3.3	The use of different training methods for specific components of fitness, physical activity and sport: continuous, Fartlek, circuit, interval, plyometrics, weight/resistance. Fitness classes for specific components of fitness, physical activity and sport (body pump, aerobics, Pilates, yoga, spinning). The advantages and disadvantages of different training methods

Key Vocabulary – Physical Training

Fitness – the ability to meet the demands of the environment

Health - a state of complete emotional, physical and social well-being and not merely the absence of disease or infirmity

Exercise – a form of physical activity done primarily to improve your health and physical fitness

Performance – how well a task is completed

Cardiovascular fitness – your ability to exercise the whole body for long periods of time (stamina or aerobic endurance)

Strength – Force exerted against a resistance

Muscular endurance – the ability to use voluntary muscles many times without getting tired

Flexibility – the range of movement possible at a joint

Body Composition – the percentage of body weight that is muscle, fat and bone

Agility – the ability to control the movement of the whole body and change direction quickly

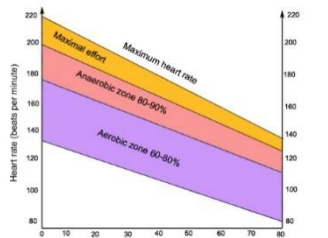
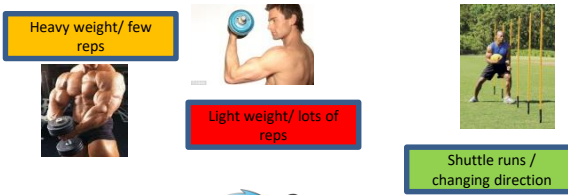
Balance – being able to keep the body stable, while at rest or in motion

Coordination – the ability to use two or more body parts together

Power – the ability to undertake strength performances quickly

Reaction Time – time taken to respond to a stimulus

Speed – the rate at which an individual can perform a movement or cover a distance



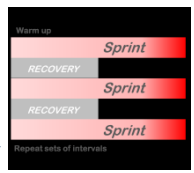
FITT Principle

Frequency = how often you exercise.

Intensity = how hard you exercise.

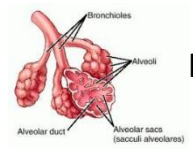
Time = how long you exercise.

Type = what kind of exercise you do.

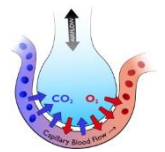


Key Vocabulary – Effects of Training

Aerobic – Exercises that use oxygen to produce energy production
Anaerobic – Exercise at high intensity levels that do not use oxygen for energy production
Long-term – Changes that happen over a period of several weeks
Stroke volume – The amount of blood ejected from the heart per beat
Vital Capacity – the biggest possible exhalation after the biggest possible inhalation
PARQ (Physical Activity Readiness Questionnaire) used to assess fitness before starting a course of physical training
Overtraining – Training beyond your body’s ability to recover
RICE (Rest, Ice, Compression, Elevation) – Treatment for soft tissue injury



GCSE PE -Edexcel Knowledge Organiser
Effects of Training



3.4 The long-term effects of exercise	3.4.1 Long-term effects of aerobic and anaerobic training and exercise and the benefits to the muscular-skeletal and cardio-respiratory systems and performance
	3.4.2 Long-term training effects: able to train for longer and more intensely
	3.4.3 Long-term training effects and benefits: for performance of the muscular-skeletal system: increased bone density, increased strength of ligaments and tendons, muscle hypertrophy, the importance of rest for adaptations to take place, and time to recover before the next training session
	3.4.4 Long-term training effects and benefits: for performance of the cardio-respiratory system: decreased resting heart rate, faster recovery, increased resting stroke volume and maximum cardiac output, increased size/strength of heart, increased capillarisation, increase in number of red blood cells, drop in resting blood pressure due to more elastic muscular wall of veins and arteries, increased lung capacity/volume and vital capacity, increased number of alveoli, increased strength of diaphragm and external intercostal muscles
3.5 How to optimise training and prevent injury	3.5.1 The use of a PARQ to assess personal readiness for training and recommendations for amendment to training based on PARQ
	3.5.2 Injury prevention through: correct application of the principles of training to avoid overuse injuries; correct application and adherence to the rules of an activity during play/participation; use of appropriate protective clothing and equipment; checking of equipment and facilities before use, all as applied to a range of physical activities and sports
	3.5.3 Injuries that can occur in physical activity and sport: concussion, fractures, dislocation, sprain, torn cartilage and soft tissue injury (strain, tennis elbow, golfers elbow, abrasions)
	3.5.4 RICE (rest, ice, compression, elevation)
	3.5.5 Performance-enhancing drugs (PEDs) and their positive and negative effects on sporting performance and performer lifestyle, including anabolic steroids, beta blockers, diuretics, narcotic analgesics, peptide hormones (erythropoietin (EPO), growth hormones (GH)), stimulants, blood doping
3.6 Effective use of warm up and cool down	3.6.1 The purpose and importance of warm-ups and cool downs to effective training sessions and physical activity and sport
	3.6.2 Phases of a warm-up and their significance in preparation for physical activity and sport
	3.6.3 Activities included in warm-ups and cool downs

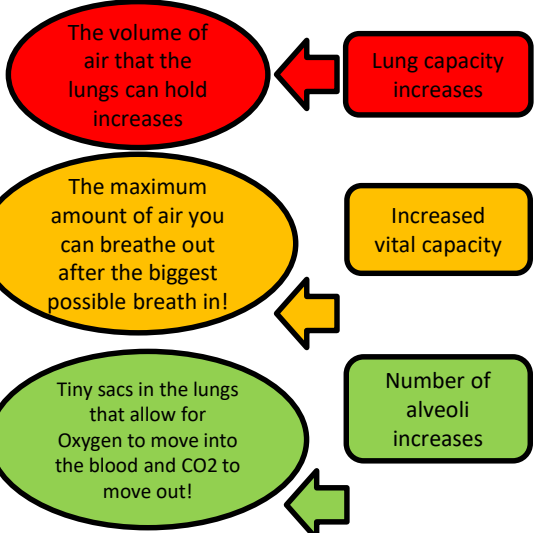
Key Vocabulary – Performance Enhancing Drugs

Anabolic Steroids – Drugs that promote bone and muscle growth
Beta Blockers – Drugs that control heart rate and a calming effect
Diuretics – Drugs which make you produce more urine which increases weight loss
Narcotic Analgesics – Drugs which relieve pain
Peptide Hormones (EPO) – Drugs which can increase red blood cell production and improve oxygen carrying capacity of the blood
Growth Hormone – Increases muscle development
Stimulants – A substance which raises the physiological or nervous activity in the body
Blood Doping – Increasing the number of red blood cells in the body by re-injecting previously extracted blood thereby increasing oxygen carrying capacity

Max Heart rate = 220 - age

Aerobic Training Zone = 60% - 80% of max heart rate

For a 15yr old
 Max Heart rate = 220 – 15 = **205 bpm**
 Lower Training Zone = 60% of 205 = **123bpm**
 Upper Training Zone = 80% of 205 = **164 bpm**

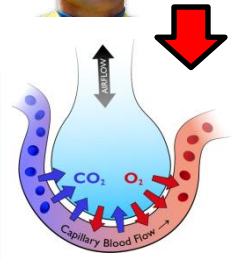


Performance enhancing drugs

S. N. A. P. D	Advantages	Disadvantages
Stimulants	<ul style="list-style-type: none"> Speeds up reactions and increases aggression Make you feel less pain 	<ul style="list-style-type: none"> Feeling less pain can make athlete train too hard Lead to high blood pressure, heart and liver problems and strokes They're addictive
Narcotic Analgesics	Kill pain - so injuries and fatigue doesn't affect performance	<ul style="list-style-type: none"> Addictive with unpleasant withdrawal symptoms Feeling less pain can make athlete train too hard Lead to constipation and low blood pressure
Anabolic Steroids	<ul style="list-style-type: none"> Increase muscle size Allow athletes to train harder 	<ul style="list-style-type: none"> Cause high blood pressure, heart disease, infertility and cancer Women may facial and body hair, and their voices may deepen
Peptide Hormones	<ul style="list-style-type: none"> Most have similar effects as anabolic steroids EPO (erythropoietin) - allows more oxygen carrying capacity due to increase of red blood cells 	Cause strokes and abnormal growth
Diuretics	<ul style="list-style-type: none"> Weight loss - important if competing in a certain weight division Can mask traces of other drugs in body 	Cause cramp and dehydration



Rest	Reduce regular exercise and activities as needed Use crutches or cane, if needed, to reduce body weight on injury
Ice	Apply an ice pack to the injury for 20 minutes at a time, 4-8 times a day Use a cold pack, ice bag or plastic bag filled with crushed ice and wrapped in a towel
Compression	May reduce swelling Use elastic wraps, special boots, air casts or splints on the injured area
Elevation	Elevate the injury to help decrease swelling Where possible, keep injured ankle, knee, elbow or wrist elevated on a pillow above the level of the heart



Reasons for participation:

Physical	Social	Emotional
Contribute to good physical health	Mix with others	Relieve and/or prevent stress and tension
Fight off illness	Make new friends	Emotional challenge
Increase cardiovascular fitness	Meet current friends	Increase self esteem and confidence
Improve performance	Develop teamwork/cooperation	Help the individual feel good
Improve body composition	Gain a good attitude towards competition	For enjoyment
Improving muscular strength and endurance		Aesthetic appreciation

Key Vocabulary:

Emotional Health – to help the individual feel good, relieve stress, increase self-esteem, caused by Serotonin

Physical Health – Changes to your body; improving fitness, increasing strength, losing weight (if overweight), lowering blood pressure, improved cardiovascular fitness

Social Health – developing the way you work with other people; teamwork, co-operation, friendship

Osteoporosis – low bone density that can cause bones to break easily.

Balanced Diet – the right range of nutrients in the correct proportions to maintain correct body weight

Macronutrients – Carbohydrates, Proteins and Fats

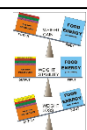
Micronutrients – Vitamins, Minerals, Fibre, Water

Carbo-loading – Increasing the amount of carbohydrate in the diet to provide more energy for endurance events



GCSE PE - Edexcel Knowledge Organiser

Health, Fitness and Well-being



In this topic students will develop knowledge and understanding of the benefits of participating in physical activity and sport to health, fitness and well-being through the following content.

1.1 Physical, emotional and social health, fitness and well-being	1.1.1 Physical health: how increasing physical ability, through improving components of fitness can improve health/reduce health risks and how these benefits are achieved
	1.1.2 Emotional health: how participation in physical activity and sport can improve emotional/psychological health and how these benefits are achieved
	1.1.3 Social health: how participation in physical activity and sport can improve social health and how these benefits are achieved
	1.1.4 Impact of fitness on well-being: positive and negative health effects
	1.1.5 How to promote personal health through an understanding of the importance of designing, developing, monitoring and evaluating a personal exercise programme to meet the specific needs of the individual
	1.1.6 Lifestyle choices in relation to: diet, activity level, work/rest/sleep balance, and recreational drugs (alcohol, nicotine)
	1.1.7 Positive and negative impact of lifestyle choices on health, fitness and well-being, e.g. the negative effects of smoking (bronchitis, lung cancer)
1.2 The consequences of a sedentary lifestyle	1.2.1 A sedentary lifestyle and its consequences: overweight, overfat, obese, increased risk to long-term health, e.g. depression, coronary heart disease, high blood pressure, diabetes, increased risk of osteoporosis, loss of muscle tone, posture, impact on components of fitness
	1.2.2 Interpretation and analysis of graphical representation of data associated with trends in physical health issues
1.3 Energy use, diet, nutrition and hydration	1.3.1 The nutritional requirements and ratio of nutrients for a balanced diet to maintain a healthy lifestyle and optimise specific performances in physical activity and sport
	1.3.2 The role and importance of macronutrients (carbohydrates, proteins and fats) for performers/players in physical activities and sports, carbohydrate loading for endurance athletes, and timing of protein intake for power athletes
	1.3.3 The role and importance of micronutrients (vitamins and minerals), water and fibre for performers/players in physical activities and sports
	1.3.4 The factors affecting optimum weight: sex, height, bone structure and muscle girth
	1.3.5 The variation in optimum weight according to roles in specific physical activities and sports
	1.3.6 The correct energy balance to maintain a healthy weight
	1.3.7 Hydration for physical activity and sport: why it is important, and how correct levels can be maintained during physical activity and sport

Food Groups:

Carbohydrates: Provide energy which enables a performer to continue exercising at high intensity for a long period of time

Fats – Provide energy which enables a performer to continue exercising for a long period of time

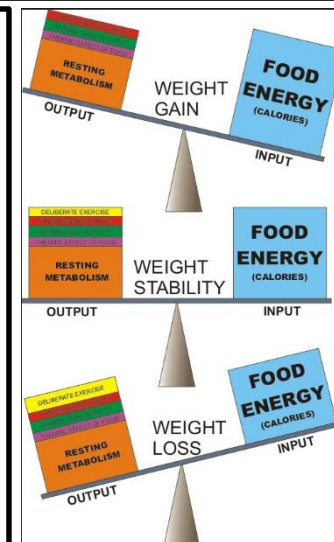
Protein - repairs muscles and helps them to grow meaning that performers can return to training quicker and become stronger

Vitamins and Minerals – calcium and vitamin D improve bone strength, Vitamin C helps to heal wounds

Water – prevents dehydration and aids the transport of nutrients and waste products; helps with temperature control

Fibre – helps to break down and digest food

Energy balance



Key Vocabulary:

Open Skill – a skill that you do not have complete control over eg: returning a tennis shot.

Closed Skill – a skill over which you have complete control – eg: basketball free throw

Massed practice – practice that occurs without rest periods during the session

Distributed practice – practice is broken down into small sessions

Fixed practice – a specific movement is practiced repeatedly, known as a drill

Variable practice – frequently changing the task for a performer

SMART Targets – Specific, Measurable, Achievable, Realistic, Time-bound

Visual feedback – watching a recording of your performance

Verbal feedback – a coach telling you about your performance

Manual guidance – a coach moves the performer through a movement to learn how it feels

Mechanical guidance – a device is used to support the performer in learning a skill – eg swimming armbands

Intrinsic feedback – information received by the performer from kinaesthetic senses – muscles, joints and balance

Extrinsic feedback – comes from an external source – a teacher or coach, from sight or sound

Concurrent feedback – received during the movement, both intrinsically and extrinsically

Terminal feedback – received when the movement is complete or after a training session

Basic skill – one that a player finds easy and needs little concentration

Complex skill – needs complete attention, technically difficult

Low organisation – a skill that has clear, simple part – eg a set shot in basketball

High organisation – has a lot of complicated phases – eg a somersault

**GCSE PE - Edexcel
Knowledge Organiser
Sport Psychology**

In this topic students will develop knowledge and understanding of the psychological factors that can affect performers and their performance in physical activity and sport through the following content.

2.1 Classification of skills (basic/complex, open/closed)	2.1.1	Classification of a range of sports skills using the open-closed, basic (simple)-complex, and low organisation-high organisation continua
	2.1.2	Practice structures: massed, distributed, fixed and variable
	2.1.3	Application of knowledge of practice and skill classification to select the most relevant practice to develop a range of skills
2.2 The use of goal setting and SMART targets to improve and/or optimise performance	2.2.1	The use of goal setting to improve and/or optimise performance
	2.2.2	Principles of SMART targets (specific, measurable, achievable, realistic, time-bound) and the value of each principle in improving and/or optimising performance
	2.2.3	Setting and reviewing targets to improve and/or optimise performance
2.3 Guidance and feedback on performance	2.3.1	Types of guidance to optimise performance: visual, verbal, manual and mechanical
	2.3.2	Advantages and disadvantages of each type of guidance and its appropriateness in a variety of sporting contexts when used with performers of different skill levels
	2.3.3	Types of feedback to optimise performance: intrinsic, extrinsic, concurrent, terminal
	2.3.4	Interpretation and analysis of graphical representation of data associated with feedback on performance
2.4 Mental preparation for performance	2.4.1	Mental preparation for performance: warm up, mental rehearsal

SMART Targets

Specific – makes sure that the target has a clear focus to achieve

Measurable – you should state exactly what you want to improve – and by how much

Achievable – your target should be within reach, but only just...

Realistic – we're not likely to break the world record in 6 weeks of training so it should be related to your capabilities.


Time-bound – I want to reach my target in 6 weeks. This keeps you focussed and provides you with motivation.

Examples:
For a 30sec 200m runner:


I want to run 200m in 29 secs in 6 weeks time or

I want to improve my 200m time by 1.5 secs in 6 weeks time or

I want to lower my 200m time by 5% in 6 weeks time.




Visual feedback




Verbal Feedback

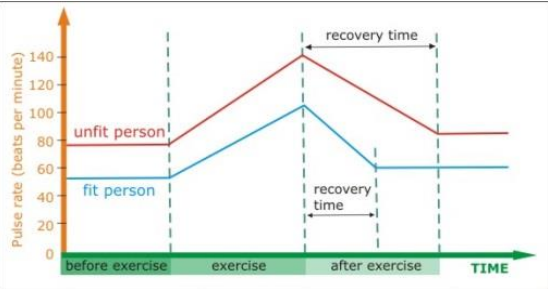
Extrinsic Feedback



Manual Guidance



Mechanical Guidance



Recording Heart Rate on a graph makes it easy to identify fitness levels

A 'fitter' person has a lower resting heart rate and a shorter 'recovery time'

An 'unfit' person's heart rate increases more rapidly in response to exercise.

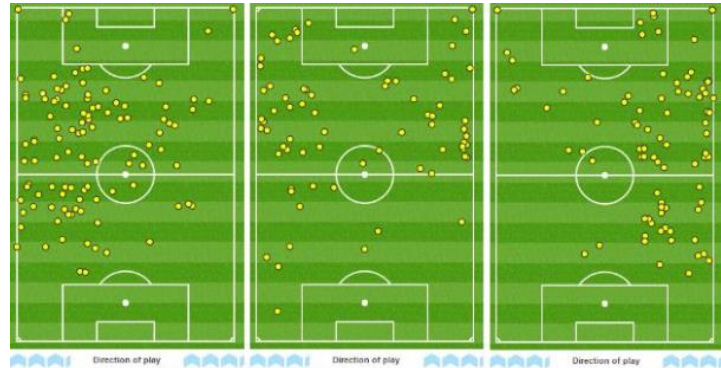
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Use of data

- 4.1 Use of data**
- 4.1.1 Develop knowledge and understanding of data analysis in relation to key areas of physical activity and sport
 - 4.1.2 Demonstrate an understanding of how data is collected in fitness, physical and sport activities – using both qualitative and quantitative methods
 - 4.1.3 Present data (including tables and graphs)
 - 4.1.4 Interpret data accurately
 - 4.1.5 Analyse and evaluate statistical data from their own results and interpret against normative data in physical activity and sport

No.	Name	Reb-O	Reb-D	Reb-All	Reb/Game	Reb/Min
15	Shaw	6	16	22	4.4	0.301
23	Djimde	6	8	14	2.8	0.264
42	Griffey	12	13	25	5.0	0.260
32	Egwu	8	6	14	2.8	0.215
12	Leonard	4	10	14	2.8	0.182
2	Bertrand	4	10	14	2.8	0.177
4	Head	5	9	14	2.8	0.175
20	Henry	7	3	10	2.0	0.154
0	Maniscalco	3	10	13	2.6	0.149
3	Paul	4	9	13	2.6	0.143

Quantitative data can be used to analyse player performance in a game (Basketball above and Football below) and make a qualitative judgement of what they did.



De Bruyne has had three different positions in City's last three Premier League games, all in midfield. He made 109 touches in 90 minutes in City's 2-1 win at Bournemouth (left-hand graphic), mainly operating on the left. He had a roaming role in City's 5-0 victory against Liverpool's 10 men (centre graphic, with 74 touches and one assist) but mostly stayed on the right when they thrashed Watford 6-0 (right-hand graphic, 87 touches and two assists)

Key Vocabulary – Use of Data

Qualitative data – Information about qualities which are based on opinion (I think that West Ham are the best because.....)

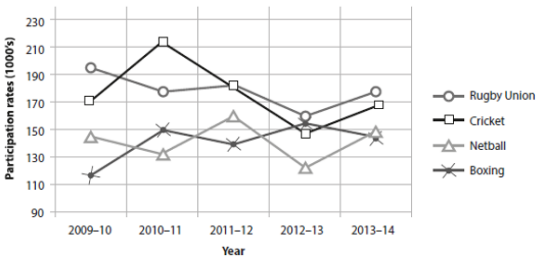
Quantitative data – Information based on measured results (how many shots were taken / how many were on target)

Analyse – to look at in detail

Evaluate – to form an idea of the value or importance of something

Interpret – to explain the meaning of information

Figure 1 shows participation rates in four sports between 2009 and 2014.



(Source: adapted from Sport England Active People Survey 8)

Figure 1

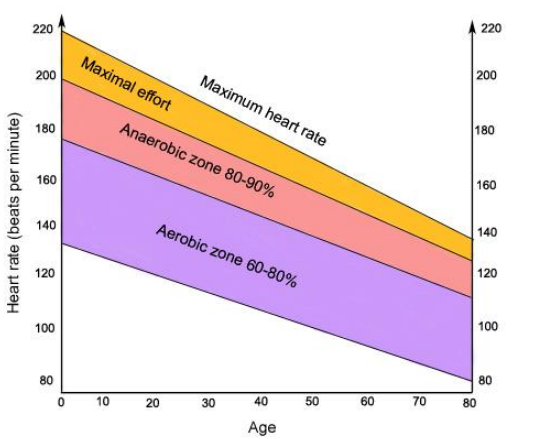
(e) Using Figure 1, identify the sport with the highest participation rate in 2013-14.

- A Boxing
- B Cricket
- C Netball
- D Rugby Union



Age	Excellent	Above Average	Average	Below Average	Poor
13-14	>2000m	1900-2000m	1600-1899m	1500-1599m	<1500m
15-16	>2100m	2000-2100m	1700-1999m	1600-1699m	<1600m

Cooper Test values for girls allows you to evaluate your performance against normative data



Max Heart rate = 220 - age

Training Zone = 60% - 80% of max heart rate

For a 15yr old
Max Heart rate = 220 - 15 = 205 bpm

Lower Training Zone = 60% of 205 = 123bpm
Upper Training Zone = 80% of 205 = 164 bpm

What are the values for the aerobic training zone of a 30 year old..?

Key Vocabulary – Physical Training

- Cardiovascular fitness** – your ability to exercise the whole body for long periods of time (stamina or aerobic endurance)
- Strength** – Force exerted against a resistance
- Muscular endurance** – the ability to use voluntary muscles many times without getting tired
- Flexibility** – the range of movement possible at a joint
- Body Composition** – the percentage of body weight that is muscle, fat and bone
- Agility** – the ability to control the movement of the whole body and change direction quickly
- Balance** – being able to keep the body stable, while at rest or in motion
- Coordination** – the ability to use two or more body parts together
- Power** – the ability to undertake strength performances quickly
- Reaction Time** – time taken to respond to a stimulus
- Speed** – the rate at which an individual can perform a movement or cover a distance
- PAR-Q** – Physical activity readiness questionnaire (must be done before starting any training)



Fitness Component	Name of Test	Protocol – How to carry it out
Speed	30m sprint test	Run 30m as fast as you can
Co-ordination	Rebound catch	Stand 1m away from a wall. Throw a tennis ball one-handed against the wall and catch the rebound with your other hand. As many as you can in 30 secs
Reaction Time	Ruler Drop	Have a partner hold a 30cm ruler in front of you. Have your thumb and index finger either side of the 0cm mark. When your partner drops the ruler, pinch the ruler and see how far it has dropped.
Agility	Illinois Agility Run	Start lying on your back. Stand, run to far cone (10m) and back, then zig-zag through 4 cones (3.3m apart and back, then 10m and back.
Power	Standing Long Jump Sergeant Jump	Stand with both feet together and jump as far forward as you can. Reach up and mark the wall with chalk. Jump as high as you can and mark the wall again. Measure the distance between the marks
Balance	Standing Stork Test	Stand on one foot. Place your other foot against your knee. Close your eyes. Stand for as long as you can.



1. Identify the fitness requirements for your favourite GCSE PE activity

2. Test yourself for each aspect of fitness

3. Compare your results to normative data to identify which aspects you need to improve and explain why.

6. Re-test your fitness, identify what has improved, suggest what you need to do in the future to improve further

GCSE PE - Edexcel Knowledge Organiser Personal Exercise Plan



Content

The areas of content covered are:

- aim and planning analysis
- carrying out and monitoring their PEP
- evaluation of data and programme.

Students are required to select one physical activity and sport on which to plan a PEP to optimise/improve their performance in that activity. Students may choose one of the three physical activities that they are performing/playing in from the activity list in Component 3: Practical Performance, or they may choose another activity from the same list. The list of activities is given on pages 23-24.

Students should be taught to make links between their learning from Components 1 and 2 and their PEP when analysing and evaluating it. Some relevant content sections may include, but are not restricted to, the following: 1.1-1.4, 3.1-3.6 from Component 1, and 1.1-1.3 from Component 2.

Normative data for MSFT

The following tables are adapted from Bizley et al (2010)^[2]

Male

Age	Excellent	Above Average	Average	Below Average	Poor
14 - 16	L12 S7	L11 S2	L8 S9	L7 S1	< L6 S6
17 - 20	L12 S12	L11 S6	L9 S2	L7 S6	< L7 S3
21 - 30	L12 S12	L11 S7	L9 S3	L7 S8	< L7 S5
31 - 40	L11 S7	L10 S4	L6 S10	L6 S7	< L6 S4
41 - 50	L10 S4	L9 S4	L6 S9	L5 S9	< L5 S2

Female

Age	Excellent	Above Average	Average	Below Average	Poor
14 - 16	L10 S9	L9 S1	L6 S7	L5 S1	< L4 S7
17 - 20	L10 S11	L9 S3	L6 S8	L5 S2	< L4 S9
21 - 30	L10 S8	L9 S2	L6 S6	L5 S1	< L4 S9
31 - 40	L10 S4	L9 S7	L6 S3	L4 S6	< L4 S5
41 - 50	L9 S9	L7 S2	L5 S7	L4 S2	< L4 S1



Key Vocabulary – Training Methods

- Continuous training** – moderate intensity exercise that lasts for at least 15-20 mins without a break (often swimming, running, cycling or rowing) – develops **cardiovascular** fitness
 - Interval training** – high intensity exercise that is followed by rest and then repeated. (eg. Sprint 10s, rest 30s, sprint 10s, rest 30s etc....) – develops **anaerobic** fitness
 - Weight training** – exercises using resistance to improve muscular strength or muscular endurance (eg. **heavy weight/low reps** – strength training, **light weights/high reps** – muscular endurance)
 - Circuit training** – a range of exercises performed at ‘Stations’ for a set amount of time or repetitions. Can be used to improve all aspects of fitness dependent on the exercises chosen (eg 30s press-ups, 30s skipping, 30s star jumps etc)
 - Fartlek training** – also known as ‘speed play’. Often running at different speeds (5s sprint, 30s jog, 10s walk, 10s sprint etc.) combined with running uphill or downhill. Develops **cardiovascular** and **anaerobic** fitness – useful for **games players**
4. Choose 1 training method that will help you to develop your chosen aspects of fitness

SPECIFICITY

S Training programmes must be specific to the needs of the sport and the performer.

For example, the training needs of a cross country runner will be different from those of a weight lifter.

PROGRESSION

P To improve and continue to develop, the training programme must be made progressively harder.

As the athlete/performer becomes fitter the training needs to be made more difficult.

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	45 Minutes Easy	25 Minutes, 2.5 Miles	Rest Day	25 Minutes, 2.5 Miles	Rest Day	30 Minutes, 3 Miles	40 Minutes, 4 Miles
2	40 Minutes Easy	30 Minutes, 3 Miles	Rest Day	30 Minutes, 3.5 Miles	Rest Day	30 Minutes, 3 Miles	50 Minutes, 5 Miles
3	50 Minutes Easy	35 Minutes, 3.5 Miles	Rest Day	35 Minutes, 4 Miles	35 Minutes, 4 Miles	Rest Day	55 Minutes, 5.5 Miles
4	30 Minutes Easy	40 Minutes, 4 Miles	Rest Day	30 Minutes and Crosstrain	35 Minutes, 4 Miles	Rest Day	60 Minutes, 6 Miles
5	30 Minutes Easy	50 Minutes, 5 Miles	Rest Day	40 Minutes, 4 Miles	35 Minutes, 3.5 Miles	40 Minutes, 4 Miles	Rest Day
6	30 Minutes, 3 Miles	30 Minutes, 3 Miles	Rest Day	35 Minutes, 3.5 Miles	Rest Day	35 Minutes, 3.5 Miles	65 Minutes, 6.5 Miles

FITT Principle

Frequency = how often you exercise.

Intensity = how hard you exercise.

Time = how long you exercise.

Type = what kind of exercise you do.

5. Create 6 weeks of training that gets gradually harder each week