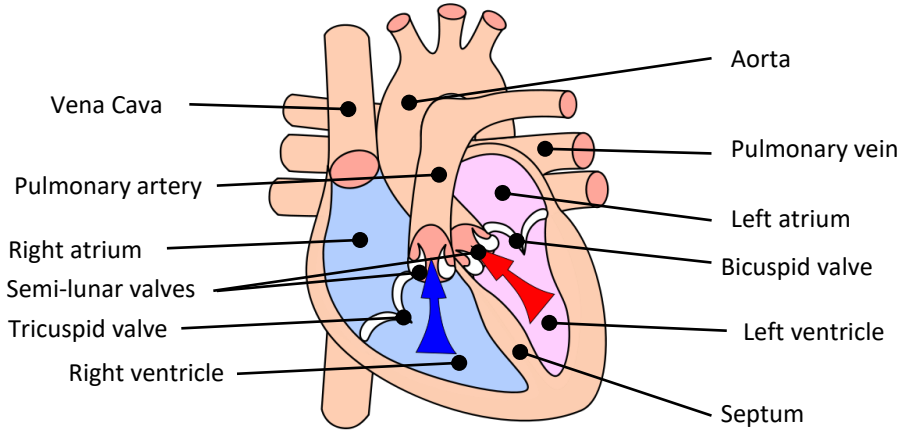
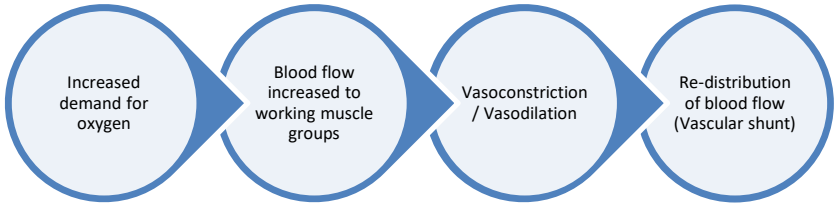
GCSE Physical Education – The structure and functions of the cardiovascular system

Structure of the cardiovascular system

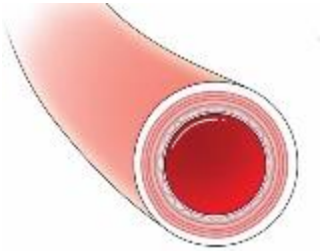


Deoxygenated blood = **BLUE** (Right side)
Oxygenated = **RED** (Left side)

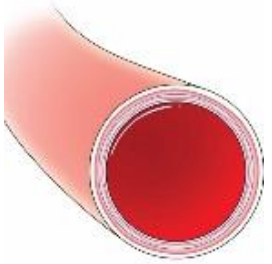
Vascular Shunting



Vasoconstriction – NARROWING

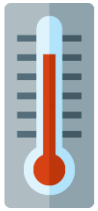


Vasodilation - EXPANDING



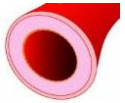
Function of the cardiovascular system

- Transport of oxygen, carbon dioxide and nutrients
- Clotting of open wounds
- Regulation of body temperature



Blood vessels

Arteries	Veins	Capillaries
1. Away from the heart 2. Oxygenated blood (except pulmonary artery) 3. Thick/elastic walls 4. High pressure 5. Small lumen	1. Back to the heart 2. Deoxygenated blood (except pulmonary vein) 3. Thin walls + larger lumen 4. Lower pressure 5. Valves	1. In the tissue 2. Site of gaseous exchange 3. Very thin walls



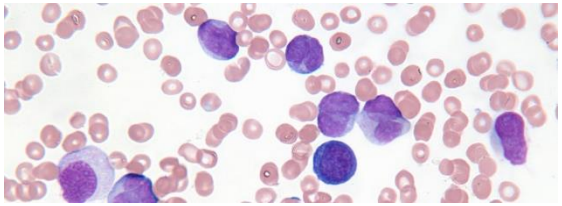
Components of blood - Red blood cells

Carry oxygen from the lungs to the working muscles + Removes CO_2.

Haemoglobin binds the oxygen

White blood cells

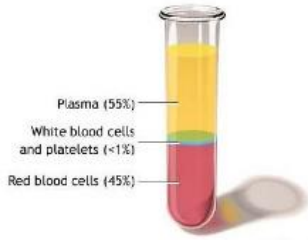
Are part of the immune system and **fight disease** and infection.



Platelets & Plasma

Platelets **clot blood** and form a scab around the site of injury.

Plasma is the **liquid/fluid** part of blood that allows it to flow.



GCSE Physical Education – Components of Fitness

Health – A state of complete mental, physical and social well-being. fitness.
Fitness - The ability to meet the demands of the environment.
Exercise - A form of physical activity done primarily to improve health and/or fitness. Not competitive sport.
Performance – The action of performing a task/action.

How to remember this?
B – Bob
M - Munches
M - More
F - Fried
C - Chicken

Relationship between these:

- Regular **exercise** increases general **health & fitness**.
- High levels of **fitness** can in turn have a positive impact on **performance**.

How to remember this?
C
R
A
B
S
P

Health Related Components of Fitness

Component	Definition	Sporting Example
Body Composition	The percentage of a body that is fat, muscle, bone and water.	 
Muscular Strength	The amount of the force muscles can generate against a resistance.	
Muscular Endurance	The ability to use voluntary muscles, over long periods of time without getting tired.	
Flexibility	The range of movement at a joint.	
Cardiovascular Fitness (Aerobic Endurance)	The ability of the heart and circulatory system to meet the demands of the body for a long period of time.	

Skill Related Components of Fitness

Component	Definition	Sporting Example
Coordination	The ability to move two or more body parts at the same time.	
Reaction Time	The time taken for a response to occur after a stimulus.	
Agility	The ability to change direction at speed.	
Balance	The ability to keep the body steady when in a static position or when moving.	
Speed	The time taken to cover a set distance/complete a movement.	
Power	The ability to combine speed and strength.	 

GCSE Physical Education – Components of Fitness

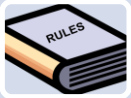
Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Performance-enhancing dugs, injury and prevention

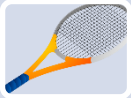
Injury prevention – to prevent injury performers and coaches should recognise and identify risks and reduce them.


Using the right principles of training to over overuse injuries



Understand and following the rules of the sport during play


Using appropriate protective clothing


Checking the equipment to make sure it is in good condition and age appropriate


Following a full warm up and cool down


Checking the facilities


Ensuring competition is balanced

Performance Enhancing Drugs (PEDs)

The rewards that come with winning are so great that athletes are increasingly temped to cheat. Fame, money and pressure are commonly cited despite the health risks or even death.

Drug	Reason for athlete taking this	Health risk	Sporting example who might use it
Beta Blockers	Slows heart rate, calms and steadies hands	Lowers blood pressure and oxygen delivery to muscles	Target sports 
Anabolic Steroids	Promote muscle growth and promotes a faster recovery time	High blood pressure, aggressive behaviour & develops male features	Power Events - 100m 
Narcotic Analgesics	Masks pain and increase pain threshold	Vomiting, addiction and liver/kidney damage	Any athlete wanted to mask pain.
Diuretics	Rapid weight loss from removal of fluids. Masks other PEDs	Dehydration, nausea and headaches. Heart and kidney failure.	Jockey Boxing 
Stimulants	Increased alertness and reduce tiredness	Heart rate irregularities & increased aggression.	Boxing 100m sprinter
Peptide Hormones	**EPO** – increase Red Blood Cell production **Growth Hormone** – increase muscle mass	Increased blood thickness/blood clot Abnormal growth	 

Blood doping – a method of artificially increasing red blood cell count – increases endurance.

Injuries

Soft tissue injuries

Strain – Pulled or overstretched muscle.

Sprain - Twisted or wrenched ligament.

Treatment for strain and sprain = **RICE** (Rest, Ice, Compression, Elevation)


R – **rest** the injured part.


I - Apply **ice** to reduce the swelling for a maximum of 10 minutes.


C – **Compress** the injured area using a bandage.


E – **Elevate** the injured part to decrease the blood supply.

Golfers Elbow/Tennis Elbow – overuse injury caused by inflamed tendons that attach muscles to the elbow joint. Symptoms also include soreness and pain.

Abrasions – minor injuries to the surface of the skin. *i.e. a graze.* Symptoms are a hot/burning sensation, redness and occasionally some light bleeding. Treatment – clean and cover with a low adhesive dressing.

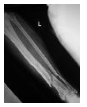
Torn Cartilage – This can occur when a joint is twisted excessively. This is commonly caused when players change direction quickly. Treatment – ice and surgery

Concussion – An injury to the brain caused by a knock to the head. Common in contact sports. If an athlete is concussed, they may:

- Become unconscious.
- Feel sick, dizzy or drowsy.
- Get confused, stare & suffer memory loss.

Dislocation - a sudden impact on a joint can cause the bones that meet to become disconnected.

Fracture – a broken bone.



Open/compound/complex fracture – bone through the skin

Closed/simple fracture – bone remains in the skin.

Greenstick fracture – bone bends (younger children)

Stress fracture - repeated or prolonged forces against the bone

GCSE Physical Education – Performance-enhancing dugs, injury and prevention

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Fitness Testing

Muscular Strength

Test: Hand Grip Dynamometer Test
Protocol: Grip the dynamometer in one hand. Start with your hand up and bring down to side while pulling in handle. No swinging your hand.

Advantages	Disadvantages
• Simple and easy to complete	• Only one size of dynamometer which may affect reading. • Focuses solely on forearm strength.

Muscular Endurance

Test: 1 minute sit up test

Test: 1 minute press up test
Protocol: Complete as many full sit ups/press ups as possible in 1 minute.

Advantages	Disadvantages
• Simple test to complete • Minimal equipment needed.	• Difficult to assess whether each repetition is performed correctly. Difficult to accurately measure large groups.

Flexibility

Test: Sit and Reach Test
Protocol: Sit with legs straight out in front and soles of feet against box/table. Reach forward without bending knees. No jerking movements.

Advantages	Disadvantages
• Quick and easy to perform. • Data table readily available for comparison	• Can cause injury if not fully warmed up appropriately. • Only measures flexibility of lower back and hamstrings.

Cardiovascular Fitness (Aerobic Endurance)

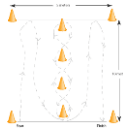
Test: 12 min Cooper Run
Protocol: Continuously run/swim for 12 minutes.
Distance recorded.

Advantages	Disadvantages
• Minimal equipment needed • Test can be self administered.	• Inaccuracy of heart rate measurements • Motivation dependant

Test: Harvard Step Test
Protocol: Step continuously for 5 minutes. Measure heart rate at 1, 2 and 3 minutes after exercise.

Advantages	Disadvantages
• Simple test to complete	• Motivation dependant

Agility



Test: Illinois Agility Test
Protocol: Start lying down at the start line. Complete course as quick as possible (10m x 5m – 4 central cones)

Advantages	Disadvantages
• Simple and easy to complete	• Motivation dependant / Timing errors.

Speed

Test: 30m Sprint Test
Protocol: Start from stationery position. Complete distance in the quickest possible time. Time is stopped when chest crosses the line.

Advantages	Disadvantages
• Quick test to complete. • Minimal equipment needed and can be performed anywhere with a flat 50m run.	• Running surfaces/weather conditions can affect the results. • Inaccuracies with stopwatch usage.

Power

Test: Vertical jump Test
Protocol: Stand next to wall and mark an initial reach while feet are flat on the ground. Standing jump to reach as high as possible. Measure distance from first mark to second.

Advantages	Disadvantages
• Quick and easy to perform. • Easy to complete with large groups.	• Technique plays are large role in successful completion.

Reliability /Validity

Validity relates to whether the test actually measures what it sets out to measure.
Reliability is a question of whether the test is accurate. It is important to ensure that the procedure is correctly maintained for ALL individuals.

<u>Results can be improved:</u>
- By using experienced testers & calibrating equipment
- Ensuring performers have the same level of motivation to complete each test
- Repeatedly test to avoid human error (x3)

GCSE Physical Education – Fitness Testing

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Fitness Testing

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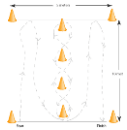

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GCSE Physical Education – Fitness Testing

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Health, Fitness and Well-Being

Lifestyle choices – the decisions we make about how we live and behave that impact on health.

Diet

Eating healthy	Eating unhealthy
1. Boosts energy levels 2. Reduces the risk of developing serious health conditions 3. Help lose weight	1. Leads to deficiencies 2. Increases weight and % body fat 3. Causes depression with poor body shape

Activity levels

Active lifestyle	Inactive lifestyle
1. Boosts self esteem 2. Reduces stress and anxiety 3. Improves fitness levels	1. Increases risk of disease 2. Decreases muscle mass, strength and energy levels

Work/rest/sleep balance

Good balance	Poor balance
1. Improves mood 2. Increases productivity at work 3. Contributes to quality of sleep	1. Increases the risk of depression 2. Leads to weight gain 3. Increased blood pressure

Well being – a combination of physical, emotional and social health.

Positives effects of training/exercise on:

Physical health

- Stronger bones (increased bone density)
- Lower cholesterol / reduced obesity
- Increase/development of components of fitness
- Increase life expectancy

Emotional health

- To increase self esteem/confidence – increased endorphins released
- Reduced risk of age-related diseases - dementia
- Relieve stress and tension
- Fun/enjoyment / reduced boredom

Social health

- To develop teamwork skill
- To meet new people/friends
- Develop communication skills
- Develop leadership skills

Social benefits may vary depending on age group:

1. Elderly
2. Children

Negative effects of training on:

- Physical health – overexertion leading to heart failure / overuse injuries
- Emotional health – training can lead to injury and cause depression
- Social health – training long hours means less time spent with family.

Recreational drugs – these are taken for pleasure and are legal to those over a certain age.

Smoking

Causes breathlessness and reduces the oxygen-carrying capacity. This affect aerobic ability for endurance events. Smoking (nicotine) increases the risk of lung cancer, bronchitis, pneumonia & emphysema.

Alcohol - contains chemicals which act on the brain affect judgement.

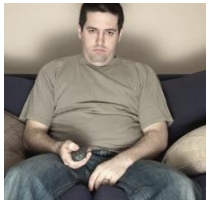
Balance, co-ordination and reactions are affected

Diuretic – increased water levels in urine and cause dehydration

Reduction of glycogen levels and slower lactic acid removal

Liver problems

Sedentary lifestyle – a lifestyle with no or irregular physical activity. This includes sitting, reading, watching television & playing video games.



Health risks associated are:

- Heart disease
- Type 2 diabetes
- Obesity
- Osteoporosis
- Depression

Impact of a sedentary lifestyle on weight

Overweight – weighing more than the expected weight for height and gender / **Overfat** – high percentage of body fat

Obese – weighing significantly more than expected.

GCSE Physical Education – Health, Fitness and Well-Being

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Methods of Training

Continuous training - Involves a steady but regular pace at a moderate intensity (aerobic) which should last for at least 20 minutes. i.e. running, walking, swimming, rowing or cycling.
Used by a **marathon runner**.

Advantages	Disadvantages
• Ideal for beginners • Highly effective for long distance athletes	• Can be extremely boring as repetitive

Interval training - Involves periods of work followed by periods of rest. *i.e. Sprint for 20 metre + walk back to start.*
Used by a **200m sprinter**

Advantages	Disadvantages
• Quick and easy to set up. • Can mix aerobic and anaerobic exercise which replicates team games.	• It can be hard to keep going when you start to fatigue (high motivation and self discipline needed) • Over training can occur if sufficient rest is not allowed between sessions (48 hours)

Fartlek training – Referred to as **'speed play'**
This is a form interval training but without rest. Involves a variety of changing intensities over different distances and terrains.
i.e. 1 lap at 50% max, 1 lap walking, 1 lap at 80% (aerobic and anaerobic used)
Used by **games players – Hockey players**

Advantages	Disadvantages
• More enjoyable than interval and continuous training • Good for sports which require changes in speed • Easily adapted to suit the individuals level of fitness and sport.	• Performer must be well motivated particularly when intensity is high • Difficult to assess whether performer is performing at the correct intensity

Plyometrics training
Involves high-impact exercises that develop **power**. *i.e. bounding/hopping, squat jumps.* Used by **long jumpers**, **100 m sprinters** or **basketball players**.

Advantages
• Easy to set up requiring little or no equipment • Hugely effective in developing power

Disadvantages
• Can result in injury if not fully warmed up. • Can place a great stress on joints and muscles.

Weight/Resistance training – A form of training that uses progressive resistance against a muscle group. Used by **cyclists**.
Muscular strength: High weight x low repetitions
Muscular endurance: Low weight x high repetitions

Advantages	Disadvantages
• Variety of equipment to prevent boredom • Strengthens the whole body or the muscle groups targeted. • Can be adapted easily to suit different sports	• Requires expensive equipment • If exercises are not completed with the correct technique it can cause injury to the performer

Circuit training - A series of exercises completed one after another. Each exercise is called a station. Each station should work a different area of the body to avoid fatigue.
i.e. press ups, sit ups, squats, shuttle runs.

Advantages	Disadvantages
• Quick and easy to set up • Easy to complete with large groups • Can be adjusted to be made specific for certain sports. *i.e. netball specific circuit*	• Technique can be affected by fatigue and can increase risk of injury • Must have motivation and drive to complete the set amount of repetitions and sets.

Fitness classes
Body pump – Weight based exercise class
Aerobics – Rhythmical dance movements set to music
Pilates/Yoga – Series of movements completed to core muscle strength & posture
Spinning – A high intensity workout on a stationery bike.

Advantages	Disadvantages
• Variety avoids boredom • Instructor will challenge & motivate • Great way to meet new people	• Gym membership can be expensive. • Group classes are not tailored to individual needs.

GCSE Physical Education – Methods of Training

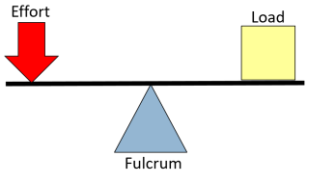
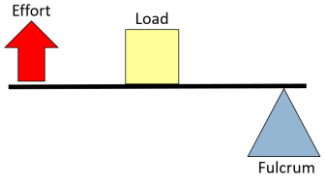
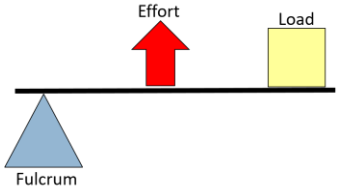
Term	Definition/notes/concept

Keywords:

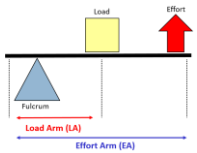
GCSE Physical Education – Movement analysis

Levers – a rigid bar that moves around a pivot point with force applied to it.

Fulcrum (F)	Effort (E)	Load (L)
A fixed pivot point 	The source of energy that will be applied 	The weight/resistance to be moved 

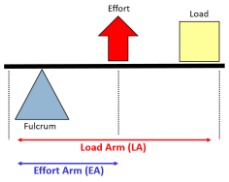
Classes of lever	Drawing	Example
First class lever:		
Second class lever:		
Third class lever:		

Mechanical advantage
This is were a lever's **effort arm** is greater than its **load arm**.

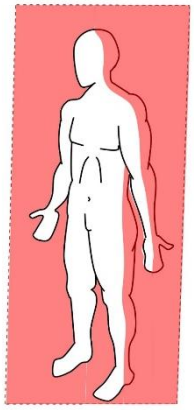
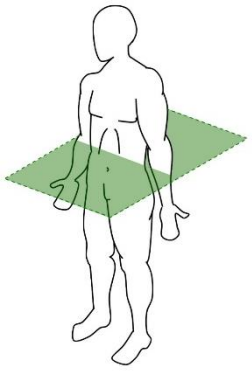
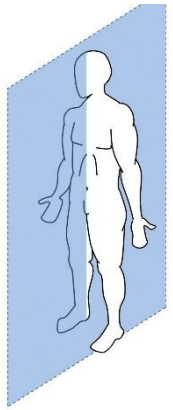


Large loads can be moved with limited effort.

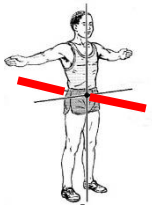
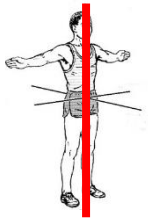
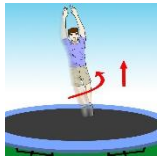
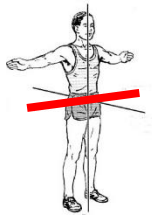
Mechanical disadvantage
This is were a lever's **load arm** is longer than its **effort arm**.



Planes – imagery lines that divide the body into two.

Frontal plane	Transverse plane	Sagittal plane
A vertical plane but this divides the body into **front** and **back.** 	A horizontal plane that divides the body into **upper** and **lower** halves. 	A vertical plane that divides the body into **right** and **left** sides. 

Axes – imagery lines that the whole body turns around.

Sagittal axis	Vertical axis	Frontal axis
Runs through the body horizontally from the back to front.  Example: Cartwheel 	Runs through the body vertically from the top to bottom.  Example: Full twist 	Runs through the body horizontally from the left to right.  Example: Sommersault 

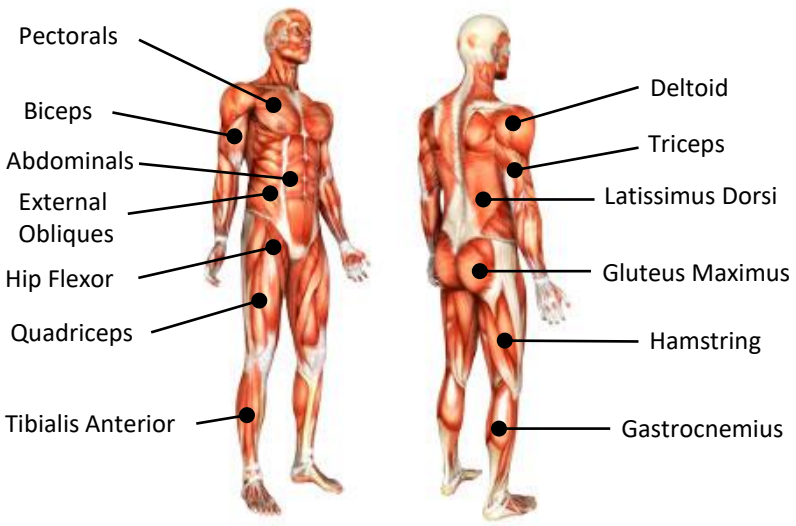
GCSE Physical Education – Movement analysis

Term	Definition/notes/concept

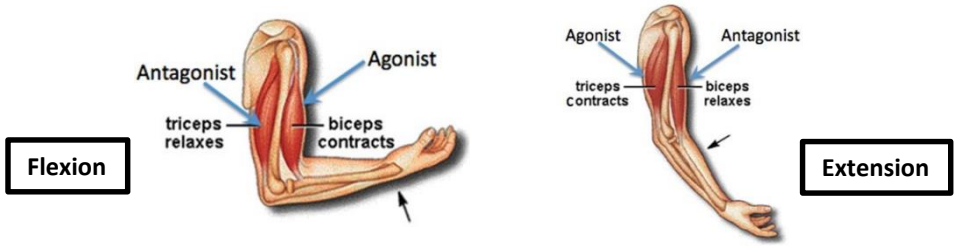
Keywords:

GCSE Physical Education – The structure and functions of the muscular system

Structure of the muscular system



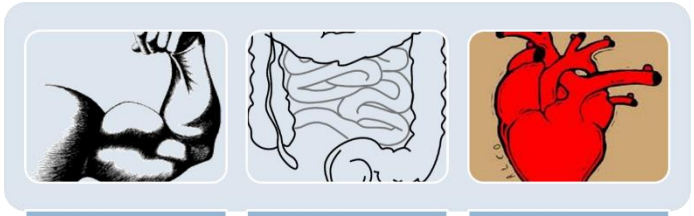
Antagonistic pairs - Muscles are arranged in antagonistic pairs.
As one muscle contracts (shortens) its partner relaxes (lengthens) *i.e. Biceps and Triceps.*



Agonist = the muscle that contracts to produce movement.
Antagonist = the muscle that relaxes to allow the movement to occur.

Examples in the body:
- Biceps & Triceps
- Quadriceps & Hamstring
- Hip Flexor & Gluteus Maximus
- Tibialis Anterior & Gastrocnemius

Types of muscle



Voluntary muscles enable movement throughout the body.

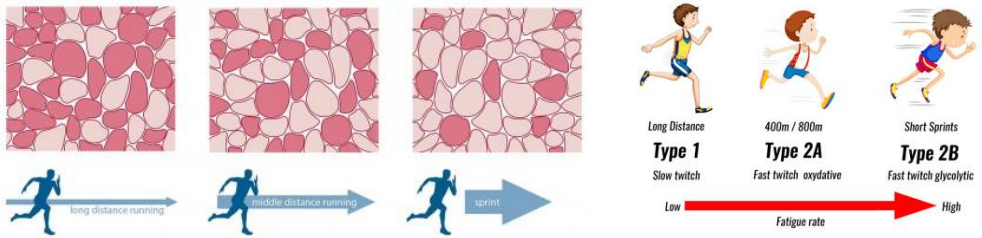
Involuntary muscles are essential in maintaining healthy body systems.

Cardiac muscle is vital in sport because it makes the heart pump. Fitness training will strengthen cardiac muscle making the heart more efficient at pumping blood around the body.

The **short term effects** of exercise on the muscles:
1. Working muscles produce heat
2. Increased muscle fatigue due to lactate accumulation
3. Blood is re-distributed to working muscles (Shunting)

Muscle fibre types

Slow twitch muscle fibres (Type I)	Fast twitch muscle fibres (Type IIa)	Fast twitch muscle fibres (Type IIx/b)
1. Smaller in size. 2. Work aerobically with high fatigue resistance. 3. Have a good oxygen supply = deep red in colour. 4. They contract slowly, but can work for long periods.	1. Larger in size 2. Work anaerobically & linked to high intensity activities. 3. Are paler in colour and have limited oxygen supply. 4. They contract quickly and powerfully, but tire easily.	1. Large in size 2. Work anaerobically & linked to extreme high intensity activities. 3. Very high speed of contraction but low fatigue resistance.
Marathon runner	**400/800m runner**	**100m Sprinter**



Link of the muscular and skeletal system – both systems work together to produce movement. *i.e. a contracting muscle pulls on a bone which changes the angle at a joint.*

GCSE Physical Education – The structure and functions of the muscular system

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Participation rates, Commercialisation & Deviancy

Participation rates – The number of people taking part in physical activity.

Age – The reason why different age groups participate can vary based on **access, cost, time available** and the **nature of the activity**.

Gender – Men and women can participate for different reasons including image, cost, time and society. Increased media coverage has helped remove many stereotypes.

Ethnicity – The number of **ethnic groups** (black, white & other minorities) playing sport are on the rise. Reasons for the difference include stereotypes, cost and cultural influences.

Disability – This can be a physical or mental impairment. Activities and rules are often adapted *i.e. Wheelchair tennis.* Other barriers include availability, cost and access.

Staying active from childhood into adulthood can improve quality of life.

Socio-economic group – This is determined by profession and available income. Factors include cost, availability and time. *i.e. golf is far more expensive to participate than athletics.*

Early involvement in sport is key to lifelong participation

Data – facts and statistics gathered to highlight information. Shown in table or graph format.

Trends - a general direction in which something is developing or changing.

Deviancy

Sportsmanship – the qualities of fairness and following the rules. *i.e. shaking hands after a match*

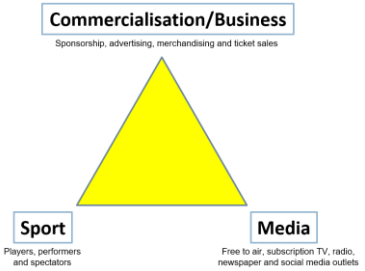
Gamesmanship – Bending the rules to gain an advantage *i.e. fainting injury to waste time*

Deviant behaviour – Behaviour that goes against the norms of society or the rules of a sport. This type of behaviour causes **negative role models**. *i.e. drug taking or biting a player*

Consequences:

1. Punishment – red card/sin bin/bans
2. Loss of sponsors / contracts with clubs
3. Damaging own reputation or club/country

Commercialisation - Sport, media and commercialisation are closely linked in a what is known as a 'GOLDEN TRIANGLE'



Sponsor

Advantages	Disadvantages
• Raise awareness of brand leading to increased sales • Displays goodwill	• Poor behaviour from athletes/clubs causes negative media attention. • Smaller sponsors might struggle to compete with larger more global brands. • Some sponsors are not suitable to be promoted within sport. *i.e. tobacco*

Player/Performers

Advantages	Disadvantages
• Allows athletes to earn income as a full time job. • Can lead to additional roles post playing career within the sport.	• Encourages deviant behaviour due to the pressure of success. • Generally, favours male over female and able bodied over disabled. • Sponsorship might be short term.

Sport

Advantages	Disadvantages
• Raises the profile of the sport due to increased exposure. • Changes to sport format/rules to make audience friendly.	• Tends to only support the popular sports. • The influence of TV has caused an increase in adverts and changed TV timings (traditions lost)

Spectator

Advantages	Disadvantages
• Offers a wider choice of sports available to watch. • Viewing experience has ben enhanced due to technology	• Encourages spectating not participating. • Can become very expensive for fans/spectators. • Affects view experience - increased TV breaks.

GCSE Physical Education – Participation rates, Commercialisation & Deviancy

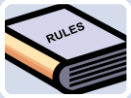
Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Performance-enhancing dugs, injury and prevention

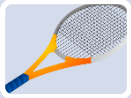
Injury prevention – to prevent injury performers and coaches should recognise and identify risks and reduce them.


Using the right principles of training to over overuse injuries



Understand and following the rules of the sport during play


Using appropriate protective clothing


Checking the equipment to make sure it is in good condition and age appropriate


Following a full warm up and cool down


Checking the facilities


Ensuring competition is balanced

Performance Enhancing Drugs (PEDs)

The rewards that come with winning are so great that athletes are increasingly temped to cheat. Fame, money and pressure are commonly cited despite the health risks or even death.

Drug	Reason for athlete taking this	Health risk	Sporting example who might use it
Beta Blockers	Slows heart rate, calms and steadies hands	Lowers blood pressure and oxygen delivery to muscles	Target sports 
Anabolic Steroids	Promote muscle growth and promotes a faster recovery time	High blood pressure, aggressive behaviour & develops male features	Power Events - 100m 
Narcotic Analgesics	Masks pain and increase pain threshold	Vomiting, addiction and liver/kidney damage	Any athlete wanted to mask pain.
Diuretics	Rapid weight loss from removal of fluids. Masks other PEDs	Dehydration, nausea and headaches. Heart and kidney failure.	Jockey Boxing 
Stimulants	Increased alertness and reduce tiredness	Heart rate irregularities & increased aggression.	Boxing 100m sprinter
Peptide Hormones	**EPO** – increase Red Blood Cell production **Growth Hormone** – increase muscle mass	Increased blood thickness/blood clot Abnormal growth	 

Blood doping – a method of artificially increasing red blood cell count – increases endurance.

Injuries

Soft tissue injuries

Strain – Pulled or overstretched muscle.

Sprain - Twisted or wrenched ligament.

Treatment for strain and sprain = **RICE** (Rest, Ice, Compression, Elevation)


R – **rest** the injured part.


I - Apply **ice** to reduce the swelling for a maximum of 10 minutes.


C – **Compress** the injured area using a bandage.


E – **Elevate** the injured part to decrease the blood supply.

Golfers Elbow/Tennis Elbow – overuse injury caused by inflamed tendons that attach muscles to the elbow joint. Symptoms also include soreness and pain.

Abrasions – minor injuries to the surface of the skin. *i.e. a graze.* Symptoms are a hot/burning sensation, redness and occasionally some light bleeding. Treatment – clean and cover with a low adhesive dressing.

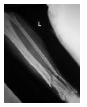
Torn Cartilage – This can occur when a joint is twisted excessively. This is commonly caused when players change direction quickly. Treatment – ice and surgery

Concussion – An injury to the brain caused by a knock to the head. Common in contact sports. If an athlete is concussed, they may:

- Become unconscious.
- Feel sick, dizzy or drowsy.
- Get confused, stare & suffer memory loss.

Dislocation - a sudden impact on a joint can cause the bones that meet to become disconnected.

Fracture – a broken bone.



Open/compound/complex fracture – bone through the skin

Closed/simple fracture – bone remains in the skin.

Greenstick fracture – bone bends (younger children)

Stress fracture - repeated or prolonged forces against the bone

GCSE Physical Education – Performance-enhancing dugs, injury and prevention

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Principles of Training

Principles of training - **Guidelines** that ensure **training is effective** and results in **positive adaptations**. These principles are used in **Personal Exercise Programmes (PEP)**

PAR-Q – Physical Activity Readiness Questionnaire
Conducted before fitness testing or an activity programme to examine the performer's readiness for training or any health conditions/lifestyle choices that may affect the successful completion.

FITT Principle

Frequency	How often training takes place.	*Increase training from once a week to two*
Intensity	How hard the exercise is.	*Increase resistance from 10kg to 15kg or increase incline on the treadmill.*
Time	The length of the session.	*Increase training session from 45 minutes to 55 minutes.*
Type	The method of training used.	*Change to from interval training to Fartlek training.*

Progressive Overload
Working the body harder than normal/gradually increasing the amount of exercise you do. *i.e. bench press 50kg x 10 repetitions and increase to 55kg x5 repetitions.*

Reversibility
If training is not regular, adaptations will be reversed. This can happen when:
- Suffering from illness and cannot train
- Injury
- After an off-season.

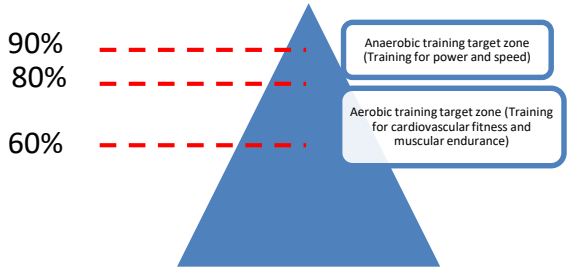
Specificity
Training showed be **matched** to the requirements of the sport or position the performer is involved in.
Training must be specifically designed to develop the right:
- Muscles
- Type of fitness
- Skills

Individual needs
All PEP's would differ depending on:
- Performer's goals/targets
- Strength and weaknesses
- Age/gender
- Current health/fitness levels

Overtraining
Occurs when you **train too hard** and do not allow the body enough **rest/recovery time**. Signs/symptoms include: extended muscle soreness, frequent illness & increase injuries.

Calculating Training Zones/Thresholds of Training
Karvonen formula used to calculate aerobic and anaerobic target training zones.

Maximum Heart Rate (MHR) = 220 – age	**Aerobic target zone: 60–80% of MHR (60% = x 0.6 / 80% = x 0.8)**	**Anaerobic target zone: 80%–90% of MHR (80% = x 0.8 / 90% = x 0.9)**



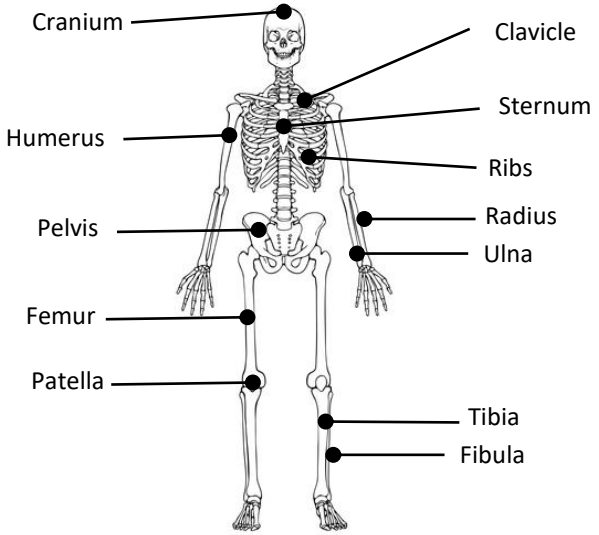
GCSE Physical Education – Principles of Training

Term	Definition/notes/concept

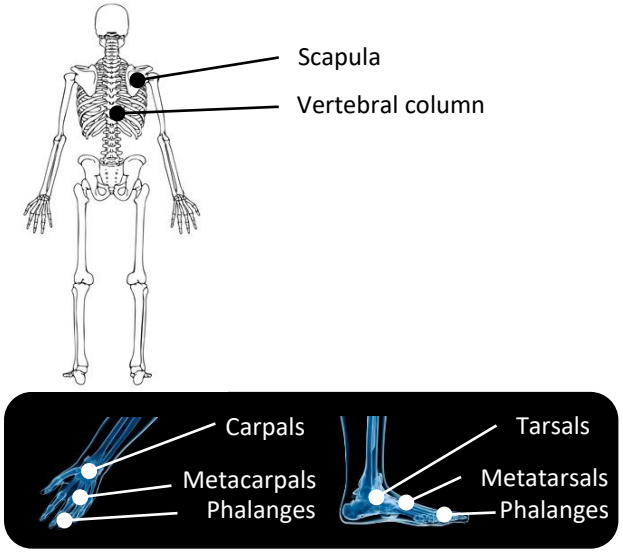
Keywords:

GCSE Physical Education – The structure and functions of the skeletal system

Structure of the skeletal system



Structure of the skeletal system



Vertebral Column

The vertebral column is divided into 5 sections. It is made up of irregularly shaped bones called vertebrae.

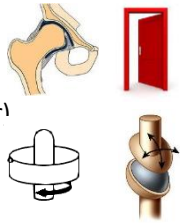
Each vertebra is protected with cartilage to prevent friction.

The vertebrae protects the spinal cord.

Function of the skeleton

- Protection of vital organs
- Muscle attachment
- Joints for movement
- Blood cell production (platelets, red and white)
- Storage of calcium and phosphorus

Classification of joint



- Pivot (neck – atlas and axis)
- Hinge (elbow and knee)
- Ball and socket (hip and shoulder)
- Condyloid (wrist)

Connective tissue

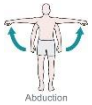
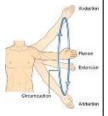
Ligaments – attaches bone to bone to add joint stability.

Tendons – attaches muscles to bone and contributes to joint movement as a result of muscle contraction.

Classification of bones

Long (leverage)	Short (weight bearing)	Flat (protection + muscle attachment)	Irregular (protection and muscle attachment)
Clear shaft region to the bone. *i.e. femur, humerus & phalanges* 	Light, small and very strong. *i.e. carpals tarsals* 	Broad surface area for muscle attachment. *i.e. cranium* 	Assist the functioning of certain joints. *i.e. Patella/vertebrae* 

Joint movements

Flexion	Adduction	Rotation	Dorsi-Flexion (ankle joint)
Decreasing the angle at a joint (bending) 	Limbs moving towards the midline of the body. 	A twisting/turning action around a joint. 	When the toes are turned up to the body. 
Extension	**Abduction**	**Circumduction**	**Planter-Flexion (ankle joint)**
Increasing the angle at a joint (straightening) 	Limbs moving away from the midline of the body. 	A combination of flexion, extension, adduction & abduction. 	When the toes are pointed away from the body. 

GCSE Physical Education – The structure and functions of the skeletal system

Term	Definition/notes/concept

Keywords:

GCSE Physical Education – Sports Psychology

Classification of skill

Skills are specific tasks that can be learnt and practiced. *i.e. Golf swing / Lay up / Tennis volley*

Continuum = sliding scale of extremes at each end

Environmental influence – Open/Closed Continuum

OPEN — CLOSED

Difficulty - Complex/Basic Continuum

COMPLEX — BASIC/SIMPLE

Organisation Level - Low/High Continuum

LOW ORGANISED — HIGH ORGANISED

Types of Practices

Massed practice: When no rest intervals are given.

Distributed practice: When a rest interval is given to allow recovery, feedback & coaching.

Fixed practice: Uses repetition of the same activity to develop consistency in performance.

Varied/Variable practice: Involves or performing a skill in different situations where conditions are changeable.

Guidance

Visual guidance: Learners are shown the whole action by the coach. *i.e. demonstration/use of video playback.*

Verbal guidance: Learners listen to information given to a performer often using associated terminology. *i.e. instructions told to a team.*

Manual guidance: Coaches will physically move a performer and support them in performing a skill. *i.e. Trampolining sommersault support.*

Mechanical guidance: Learners use equipment to help support the practicing of a skill. *i.e. floats during swimming stroke development.*

Feedback

Vital part of information processing which provides confidence, motivation and improves performance.

Intrinsic feedback: This comes from within the performer. Kinaesthetic senses provide feelings from muscles/joints about the action.

Extrinsic feedback: This comes from results and match analysis.

1. Knowledge of results – the outcome
2. Knowledge of performance

Concurrent feedback: Information provided to the athlete during the performance.

Terminal feedback: Information provided to the athlete before or after the performance.

Mental Preparation for Performance

Mental rehearsal/Imagery involves the athlete imagining themselves in an environment performing a specific activity using all of their senses.

This can be used to:

- Familiarise the athlete with a competition site or a complex play pattern or routine.
- Motivate the athlete by recalling images of their goals or of success in a past competition.
- Perfect skills or skill sequences the athlete is learning or refining.
- Reduce negative thoughts by focusing on positive outcomes.

SMART Targets

Goal setting motivates performers

- Short Term goals
- Long Term goals
- Outcome goals
- Performance goals

Specific	Measureable	Achievable	Realistic	Time-Bound
Targets must be concise. ***"To take a 0.5 second off my time personal best time"***	Must be measured and compared. ***"I will time my runs every training session for the next five weeks of training"***	Target must be challenging but yet reachable. ***"My coach and I devised the training programme around improving leg power for my start"***	Matched to the performers skill level. ***"We agreed that a 0.5 seconds off my personal best is realistic for my current ability and status"***	Set for a particular time to be completed. ***"We agreed to do the training programme four times per week for the next five weeks"***

GCSE Physical Education – Sports Psychology

Term	Definition/notes/concept

Keywords: