

GCSE Physical Education – Components of Fitness

Health – A state of complete mental, physical and social well-being (not merely the absence of disease or infirmity).

Fitness - The capacity to carry out life's activities without getting too tired.





Well-being – a feeling or mental state of being contented, happy, prosperous and healthy.

Sedentary – a lifestyle that is inactive and involves much sitting down

Relationship between these:

- Regular **exercise** increases general **health, fitness** and **well-being**.
- High levels of **fitness** can in turn have a positive impact on **well-being** and **sedentary** lifestyles.

Health Related Components of Fitness

Component	Definition	Sporting Example
Muscular Strength	The ability of a muscle to exert force for a short period of time.	
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 Endurance (stamina) VO2 Max O2 intake per minute	The ability of the heart and circulatory system to continuously exercise without tiring (for a long period of time).	

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



Skill Related Components of Fitness

Component	Definition	Sporting Example
Coordination	The ability to move different limbs at different times or to do more than one task at a time effectively.	
Reaction Time	The ability to react quickly in sport situations to outwit your opponent or outspurt another athlete	
Agility	The ability to change direction under control, whilst maintaining speed, balance and power.	
Balance	The ability to keep your body mass or centre of mass over a base of support.	
Speed	The ability to move the body quickly.	
Power	The ability to combine speed and strength.	

How to remember this?
C
R
A
B
S
P



GCSE Physical Education – Components of Fitness

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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
<ul style="list-style-type: none"> • Simple and easy to complete 	<ul style="list-style-type: none"> • Only one size of dynamometer which may affect reading. • Focuses solely on forearm strength.

Muscular Endurance

Test: sit up test (metronome)

Protocol: Complete full sit ups in time to the beat on the recording



Test: Maximal press up test

Protocol: complete as many press-ups as possible resting in the "up" position



Advantages	Disadvantages
<ul style="list-style-type: none"> • Simple test to complete • Minimal equipment needed. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Quick and easy to perform. • Data table readily available for comparison 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Minimal equipment needed • Test can be self administered. 	<ul style="list-style-type: none"> • Inaccuracy of heart rate measurements • Motivation dependant

Test: Multi-Stage Fitness Test

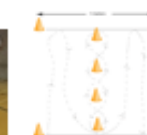
Protocol: Shuttle run continuously for 20 metres. Record the level and point that you cannot continue at that pace for.

Advantages	Disadvantages
<ul style="list-style-type: none"> • Simple test to complete 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Simple and easy to complete 	<ul style="list-style-type: none"> • Motivation dependant / Timing errors.

Speed

Test: 30m Sprint Test

Protocol: Start from stationary position. Complete distance in the quickest possible time. Time is stopped when chest crosses the line.



Advantages	Disadvantages
<ul style="list-style-type: none"> • Quick test to complete. • Minimal equipment needed and can be performed anywhere with a flat 50m run. 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Quick and easy to perform. • Easy to complete with large groups. 	<ul style="list-style-type: none"> • Technique plays a 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.



Results can be improved:

- 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

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Keywords:

GCSE Physical Education – Types 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
<ul style="list-style-type: none"> • Ideal for beginners • Highly effective for long distance athletes 	<ul style="list-style-type: none"> • Can be extremely boring as repetitive

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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Performer must be well motivated particularly when intensity is high • Difficult to assess whether performer is performing at the correct intensity

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
<ul style="list-style-type: none"> • Variety of equipment to prevent boredom • Strengthens the whole body or the muscle groups targeted. • Can be adapted easily to suit different sports 	<ul style="list-style-type: none"> • Requires expensive equipment • If exercises are not completed with the correct technique it can cause injury to the performer

HIIT Training

These are High Intensity Interval Training activities where speed and recovery are used throughout the session. Exertion levels are high (7/10) for between 30 secs and 3 mins. Work output is much shorter than recovery time
Examples might be Body pump, High Impact Aerobics, Spinning.



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
<ul style="list-style-type: none"> • Quick and easy to set up. • Can mix aerobic and anaerobic exercise which replicates team games. 	<ul style="list-style-type: none"> • 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)

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
<ul style="list-style-type: none"> • Easy to set up requiring little or no equipment • Hugely effective in developing power
Disadvantages
<ul style="list-style-type: none"> • Can result in injury if not fully warmed up. • Can place a great stress on joints and muscles.



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
<ul style="list-style-type: none"> • Quick and easy to set up • Easy to complete with large groups • Can be adjusted to be made specific for certain sports. i.e. <i>netball specific circuit</i> 	<ul style="list-style-type: none"> • 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.

Advantages	Disadvantages
<ul style="list-style-type: none"> • Variety avoids boredom • Instructor will challenge & motivate • Great way to meet new people 	<ul style="list-style-type: none"> • Gym membership can be expensive. • Group classes are not tailored to individual needs.

GCSE Physical Education – Methods of Training

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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 when planning an Exercise Programmes

FITT Principle

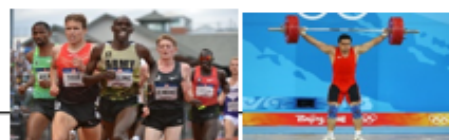
Frequency	How often training takes place.	<i>Increase training from once a week to two</i>
Intensity	How hard the exercise is.	<i>Increase resistance from 10kg to 15kg or increase incline on the treadmill.</i>
Time	The length of the session.	<i>Increase training session from 45 minutes to 55 minutes.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

Specificity

Training should 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

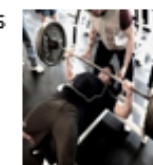


PAR-Q – Physical Activity Readiness Questionnaire

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.

Progression

Using overload in a progressive way over the course of a programme. Once adaptations have happened overload needs to be applied to make gains again, e.g. lifting more in week 12 than in week 2 of the programme.



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 x 5 repetitions.*

Reversibility

If training is not regular, adaptations will be reversed. This can happen when:

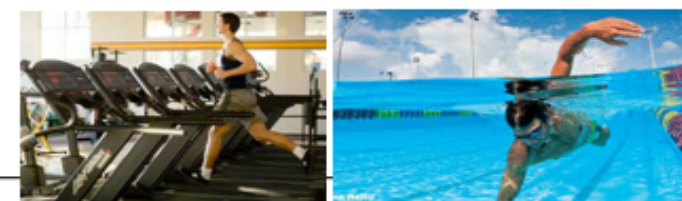
- Suffering from illness and cannot train
- Injury
- After an off-season.



Individual needs

All athletes programmes would differ depending on:

- Performer's goals/targets
- Strength and weaknesses
- Age/gender
- Current health/fitness levels

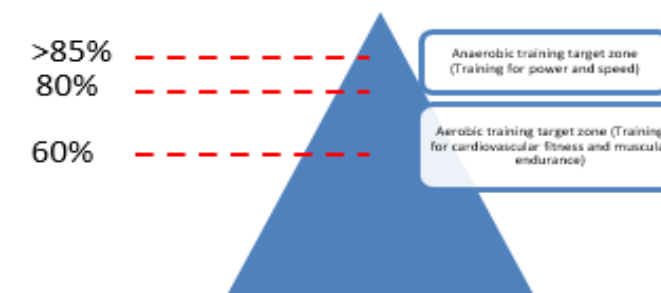


Overtraining

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

Maximum Heart Rate (MHR) = 220 – age	Aerobic target zone: 60–80% of MHR (60% = $x 0.6$ / 80% = $x 0.8$)	Anaerobic target zone: > 85% MHR (85% = $x 0.85$)
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GCSE Physical Education – Principles of Training

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Keywords:

GCSE Physical Education – Warm up and cool down, injury and prevention

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



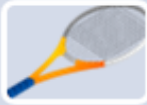
Using the right principles of training to overuse injuries



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

Warm up

Pulse raiser	An activity that increases heart rate and temperature.
Stretches	An activity that increases the elasticity of muscles, tendons and ligaments.
Mobility	An activity that takes the joint through the full range of motion.
Dynamic movements	An activity that involves changes in speed and direction.
Skill rehearsal	An activity that mirrors game demands.

Cool Down

Low intensity exercise	An activity that gradually decreases temperature and heart and breathing rates.
Stretches	Static stretches that decrease muscle temperature.

Injuries

Soft tissue injuries

Strain – Twist or tear to a muscle or tendon.

Sprain – Twist or overstretch to a ligament.

Treatment for strain and sprain = **RICE** (Rest, Ice, Compression, Elevation) for 24 - 48 hours.



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.

Head Injury

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.



Spinal Injury

A serious and painful injury to the spine. This could be paralysing or fatal. This may occur during a rugby scrum or falling off a horse.

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



Dislocations - a sudden impact to a joint can cause the bones that meet to become disconnected or moved out of place.



Blisters

These are caused through friction and rubbing e.g. on footwear. Fluid is released under the skin to form a protective layer. The swelling becomes painful.

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

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Keywords:

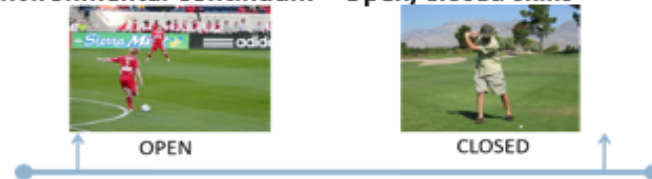
GCSE Physical Education – Sports Psychology

Classification of skill

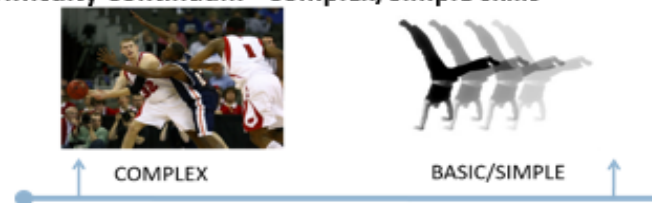
Skills are specific tasks that can be learnt and practiced. *i.e. Golf swing / Lay up / Tennis volley*

Continuum = sliding scale of extremes at each end

Environmental Continuum – Open/Closed skills



Difficulty Continuum - Complex/Simple skills



Skilful Movement

- **Efficiency** e.g. no wasted energy – good timing
- **Pre-determined** e.g. planned like a routine
- **Co-ordinated** e.g. run and kick/hit
- **Fluent** e.g. one skill transfers into another
- **Aesthetic** e.g. technique looks good

SMART Targets

Goal setting motivates performers

- Short Term goals:
- Long Term goals:
- Outcome goals: result based
- Performance goals: technique based

Mental Preparation

- **Imagery** e.g. pictures in the mind
- **Mental Rehearsal** e.g. internal view / external view
- **Selective Attention** e.g. filtering relevant information
- **Positive Thinking** (self talk) e.g. rehearsing success
- **Concentration** –

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



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 – techniques used
Knowledge of Results: Information provided to the athlete detailing stats and data from the event/training

Knowledge of Performance: Information provided to the athlete after the performance in terms of technique and tactical decision making.

Guidance (Positive & Negatives)

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 somersault support.*

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



Specific	Measureable	Achievable	Recorded	Timed
Targets must be concise and clear. <i>"To take a 0.5 second off my time personal best time"</i>	Must be measured and compared. Easy to monitor. <i>"I will time my runs every training session for the next five weeks of training"</i>	Target must be challenging but yet reachable. Motivating. <i>"My coach and I devised the training programme around improving leg power for my start"</i>	Needs to be recorded to track progress. <i>"We keep a diary of times and distances for every training session to inform the planning for the next one and plot progress against our aim"</i>	Set for a particular time to be completed. <i>"We agreed to do the training programme four times per week for the next five weeks"</i>