

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.

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?
 B – Bob
 M – Munches
 M – More
 F – Fried
 C – Chicken



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 – 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: 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
<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: Harvard Step Test

Protocol: Step continuously for 5 minutes.

Measure heart rate at 1, 2 and 3 minutes after exercise.



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)

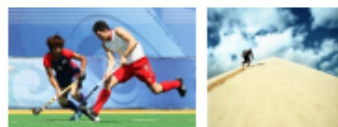
GCSE Physical Education – Methods of Training

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
<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

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.



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 – Performance-enhancing drugs, 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

Performance Enhancing Drugs (PEDs)

The rewards that come with winning are so great that athletes are increasingly tempted 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.



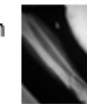
Fracture – a broken bone.

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 – 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)

FITT Principle

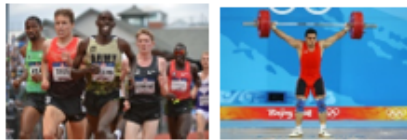
Frequency	How often training takes place.	Increase training from once a week to two
Intensity	How hard the exercise is.	Increase resistance from 10kg to 15kg or increase incline on the treadmill.
Time	The length of the session.	Increase training session from 45 minutes to 55 minutes.
Type	The method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

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.

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 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 PEP's would differ depending on:

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



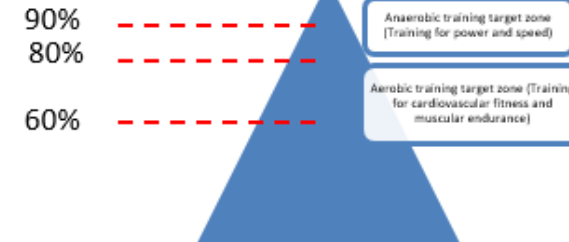
Overtraining

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% = $x \cdot 0.6$ / 80% = $x \cdot 0.8$)	Anaerobic target zone: 80–90% of MHR (80% = $x \cdot 0.8$ / 90% = $x \cdot 0.9$)
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Aims

- ◆ By completing this unit, you will gain an understanding of the range of outdoor activities that are available in the UK and be able to identify organisations that provide access to these activities.
- ◆ You will develop an in-depth understanding into the risks which are involved in certain outdoor adventurous activities. You will also consider how to plan an outdoor activity and be able to participate in one.
- ◆ You will gain an understanding of health and safety and risk assessments in outdoor scenarios, of detailed planning for a group activity with multiple variables.

Learning outcome 1

Know about different outdoor adventurous activities and their provisions



Learning outcome 2

Understand the value of participating in outdoor activities

General Benefits

Increased confidence
 Enjoyment and challenge
 Improved health and fitness
 Increased motivation
 Greater environmental awareness
 Increased motivation
 Opportunity to socialise

Skill Benefits

Social skills
 Team building
 Decision making
 Planning and organising
 Problem solving
 Communication

Learning outcome 3

Be able to plan an outdoor activity

Things to consider	Y / N
Health and safety	
Clothing and equipment	
Location	
Supplies	
Emergency procedures	
Shelter	
Weather forecast	
Timings	
Terrain	

Learning outcome 4

Be able to demonstrate knowledge and skill during outdoor activities



Communication

