

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


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






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).	

Skill Related Components of Fitness

How to remember this?
 C
 R
 A
 B
 S
 P



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 out wit 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.	

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)

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

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)

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

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.



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

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.

HIIT Training

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



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.

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

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.	<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>

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 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.

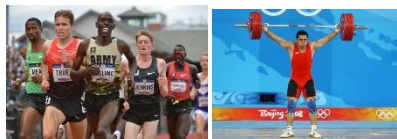


Specificity

Training 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



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

<p>Maximum Heart Rate (MHR) = 220 – age</p>	<p>Aerobic target zone: 60–80% of MHR (60% = x 0.6 / 80% = x 0.8)</p>	<p>Anaerobic target zone: > 85% MHR (85% = x 0.85)</p>
--	--	--

