PE – Health, Fitness and Wellbeing

1 Health and Physical Fitness

There is a very close link between fitness and health. Exercise is the link between the two. Exercise and physical activity promote general healthiness
You can be fit but not healthy.

Health
'A state of physical, social and mental well being'

People tend to feel they are healthy simply when they do not feel ill. This definition clearly describes that health is much more and involves feelings of happiness, social interaction and energy.

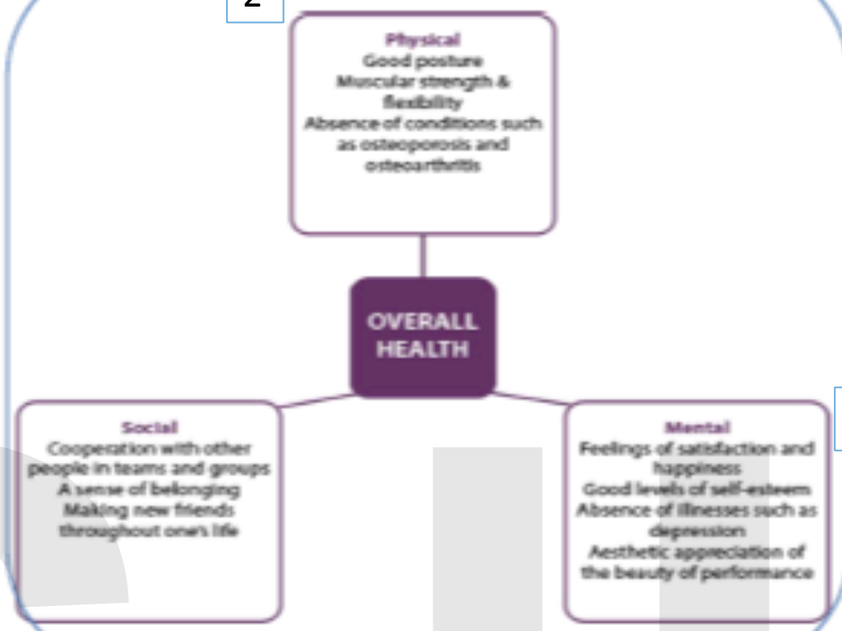
Fitness
'The ability to meet the demands that the environment places on the body'

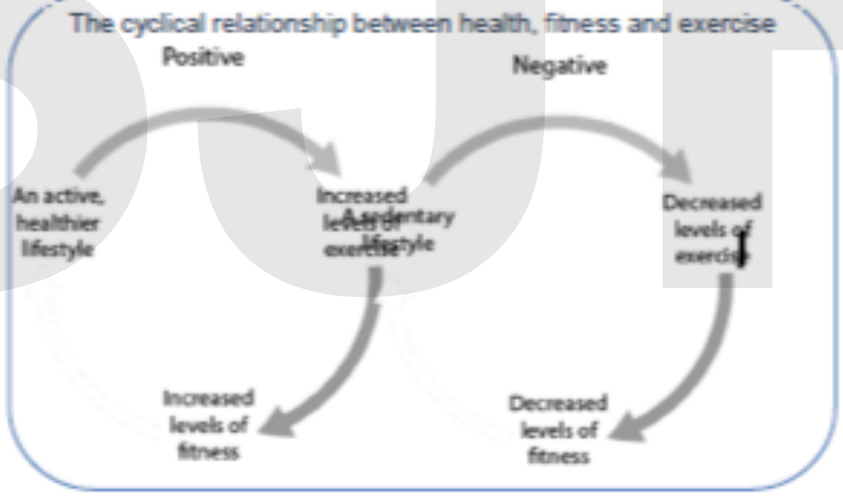
This relates to how physically demanding life is. Therefore, a person doing an office job requires lower levels of physical fitness than an Olympic athlete. With so many people working in nonphysical or sedentary jobs, this means that the fitness requirements of society decrease, leading to a heavier and less mobile society. In this negative context, health levels tend to decrease and people take part in much less exercise.

Exercise
"A form of physical exercise done to improve health or fitness, or both".

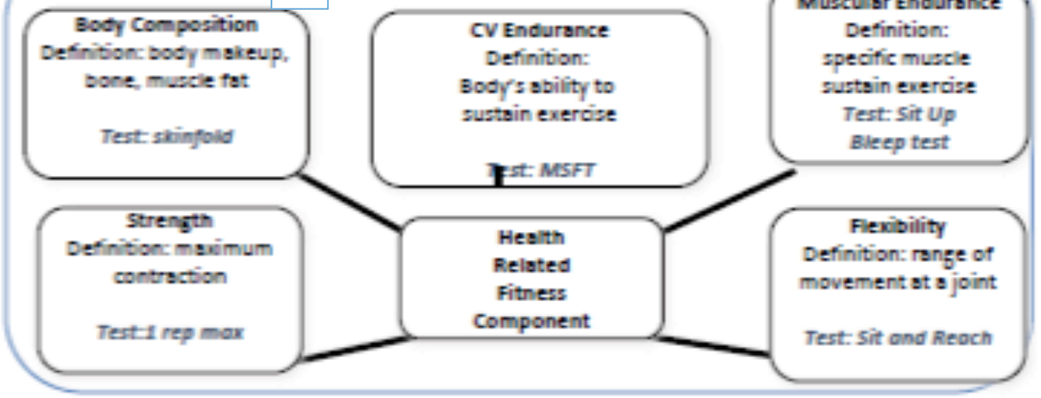
It is recommended that adults and children follow different activity routines in order to maintain good health and fitness. Activity should be physical enough to cause the person to breathe more deeply and to begin to sweat.

2 Overall Health





3 Health Related Fitness Components



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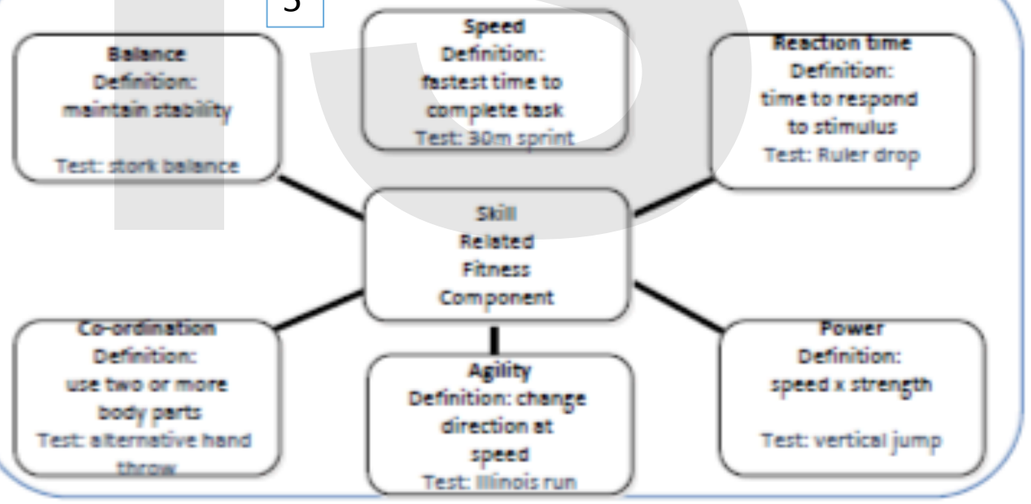
Health-related component	Example
Body composition	The gymnast has a lean body composition to allow them to propel through the air when performing on the asymmetrical bars
Cardiovascular fitness	Completing a half marathon with consistent split times across all parts of the run
Flexibility	A gymnast training to increase hip mobility to improve the quality of their split leap on the beam
Muscular endurance	A rower repeatedly pulling their oar against the water to propel the boat towards the line
Muscular strength	Pushing with all one's force in a rugby scrum against the resistance of the opposition pack

5 Skill Related Fitness Components



Issues with a sedentary lifestyle

It is estimated a lack of exercise is responsible for about 5.3 million deaths a year worldwide – about the same number as smoking.

This is based on estimates of the impact on inactivity on coronary heart disease, type 2 diabetes and two specific cancers – breast and bowel – where lack of exercise is a major risk factor. High blood pressure and the narrowing of the arteries are also consequences of a sedentary lifestyle.

The risks of not exercising include hypertension, obesity, atherosclerosis, poor self esteem, poor body image and self-confidence.

6

Skill-related components	Example
Agility	A badminton player moving around the court from back to front and side to side at high speed and efficiency
Balance	A sprinter holds a perfectly still sprint start position and is ready to go into action as soon as the gun sounds
Coordination	A trampolinist timing their arm and leg movements to perform the perfect tuck somersault
Power	A javelin thrower applies great force to the spear while moving their arm rapidly forward
Reaction time	A boxer perceives a punch from their left and rapidly moves their head to avoid being struck
Speed	A tennis player moving forward from the baseline quickly to reach a drop shot close to the net

PE – Measuring Health and Fitness

1

Fitness Testing for Components of Fitness

Fitness testing is an essential feature of all fitness training and will be used before training begins, during the training programme and again at the end of the training programme. It is important to identify strengths and weaknesses, baseline, current state, improvement, comparisons and motivation.

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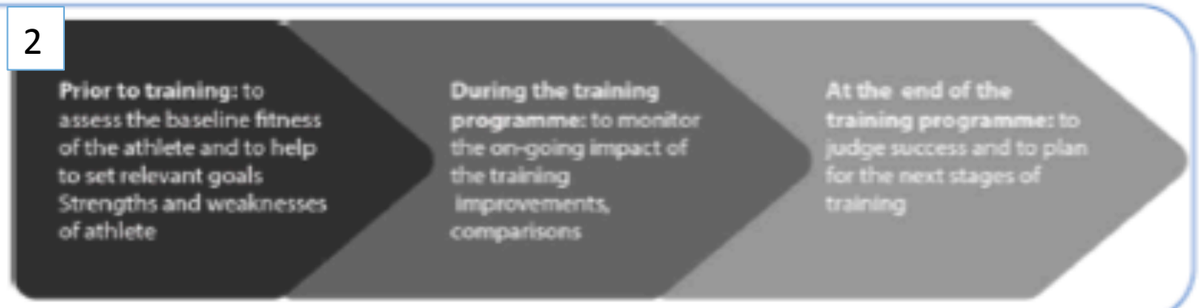

Skill Related Fitness Tests

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Agility – Illinois agility test
- Mark out the course with the exact measurements required.
- Participant starts in a face-down, lying position at the start line.
- Ensure accuracy of timing with two timers at the finish line.

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Coordination – Alternate hand wall toss test
- Participant stands exactly two metres from a smooth-surfaced wall.
- Participant throws the ball with one hand, catches it with the other hand and repeats the action.
- Non-participant counts the number of successful catches in 30 seconds.

Power – Sergeant Jump
- Participant stands sideways near a wall and measures their height with an upstretched arm.
- The average distance between the standing and jumping height is taken as the score.

Reaction time – Ruler drop test
- Hold a 30 cm ruler above the open hand of the participant.
- The 0 cm mark must be directly between the thumb and index finger.
- Non-participant drops the ruler with no warning and participant catches it.
- The score is taken from where the top of the thumb hits the ruler after three tests provide an average.

Balance – Standing stork test
- Participant places their hands on their hips and one foot on the inside knee of the opposite leg.
- Participant raises their heel and holds their balance for as long as possible.
- The score is taken as the total time the participant held their balance successfully.

Speed – 30 metre sprint test
- Mark out a 30 m distance on an even, firm surface.
- Participant takes a rolling start so that they are running at full speed as they hit the start line.
- Ensure accurate timing by using two timers.

Health Related Fitness Tests

5

Strength – Handgrip dynamometer
- Grip with dominant hand.
- Apply maximum force while arm is straight in front of the body.
- Repeat three times while non-participant records the maximum force reading.

Cardiovascular endurance – Multi-stage fitness test
- Mark out a 20 m course.
- Participants must arrive at the finish line on the beep or wait for the beep before running back.
- Participants must run until total exhaustion prevents completion of two to three shuttles.

Muscular endurance – 60 second press-up test
- On a cushioned surface, the participant performs as many full press-ups as possible in 60 seconds.
- Elbows moving from the locked, straight position to 90 degrees of flexion.
- Non-participant counts the completed actions and judges that all actions are full.

6

Flexibility – Sit and reach test
- Remove shoes and position box against the wall.
- Keep knees completely locked and reach forward with one hand on top of the other.
- Stretch and hold position for two seconds while non-participant records score.

Body Composition – Skin Fold test
- Using skin fold callipers measure the level of body fat in the body.
- Take measurements at the triceps, subscapular, suprailiac, abdomen, front thigh, chest or rear thigh.

Physical Education – Health, Training and Exercise

1 Methods of training

1.Continuous: low to medium intensity keeping the heart rate constant

2. Interval: Work/rest ratio. Works on sets and reps.

3. Circuit: Different stations of exercise, allowing recovery between station or circuit.

4. Weight: Uses repetitions and sets. The weight is dependent upon these will determine the component of fitness developed.

5. Plyometrics: Eccentric muscular contractions. Jumping over obstacles, landing and rebounding.

2 Application of Methods of Training

1. Continuous training develops cardiovascular fitness. A minimum of 20 minutes sub-maximal work. Target **heart rate** range between 60–80% max HR. Aerobic work. Swimming, running, cycling, walking or a combination of these disciplines. Disadvantage – some participants find longer sessions to be boring .

2. Interval training develops strength, speed and muscular endurance. Periods of intense work interspersed with timed rest. A wide variety of **fitness** types can be developed. Structured in reps and sets. Intensity is measured by % max HR. Disadvantage – maximal nature of intervals can be too challenging for some participants.

3. Circuit training can develop strength, speed, agility, muscular endurance or cardiovascular endurance. A form of interval training. A series of exercises or activities arranged in a special order called a circuit. A circuit usually involves 6-10 exercises performed at stations. The exercises work different muscle groups and circuits usually avoid working the same muscle group at two consecutive stations. Examples of circuit exercises are sit-ups, press-ups, squats, lunges and step-ups. Sports skills can also be included such as dribbling, shooting and passing for basketball players.

3 Application of Methods of Training

4. Weight training develops strength. An interval form of training. Intensity is measured in % 1 REP MAX (% of maximum lift). Time is structured in reps and sets with specific timings for recovery between sets. Huge range of possible lifts combining machines, free weights and body weight exercises. Disadvantage – many performers use poor technique while striving for ever greater weight.

5.Plyometric training develops speed, coordination and power. High intensity exercise involving explosive movements. The muscle is lengthened and then rapidly shortened to develop the explosive capability of the muscle. Suitable for well-trained athletes. Very effective for developing power. Disadvantage – can cause injury if athlete is not in excellent condition.

Key Words

Methods	Continuous	Specificity	Threshold
Principles	Circuit	Progression	Target
Training	Weight	Overload	Aerobic
Maximum	Plyometrics	Variance	Anaerobic

4 Principles of Training

S	Specificity – training or exercise related to the needs of the individual.
P	Progression – training becomes more difficult over time.
O	Overload – greater demands are placed on the body, intensity, frequency and duration.
V	Variance – to stay motivated training and exercises must vary.

5 Application of Principles of Training

Specificity—Training must be relevant to the individual and their sport. This can be achieved by tailoring training specifically for the sport or even the position that the individual plays, the muscle groups they use the most or the dominant energy system of the athlete. For example, a 100 m sprinter is likely to train very differently to a 10 km racer despite them both being track athletes. The sprinter will focus on speed and power while the distance runner will train for cardiovascular fitness and the ability to work aerobically at high intensity.

Progression - Start slowly and gradually increase the amount of exercise and keep overloading. It is important not to progress to quickly as you may risk injury or over train. This is particularly important for sedentary individuals.

6 Application of Principles of Training

Overload—Unless the body is subjected to increased demands, improvements in physical fitness will not be made. If a physical fitness programme is to be effective, it must place increased and specific demands on the body. If training levels remain the same, then the programme will only be maintaining the participants level of fitness, not improving it.

Variance—Training must be varied, this will help with progression. Variance tends to focus on different training sessions and activities still working on the specific component of fitness. It will help to avoid a plateau in performance and also reduce tedium.

Physical Education – Health, Training and Exercise

7 Training Zones

Training thresholds

Training is effective when it specifically targets the individual athlete. One way of achieving this is by targeting the most relevant training threshold. For many athletes this involves calculating a specific **working heart rate:**

Maximum heart rate = 220 – age

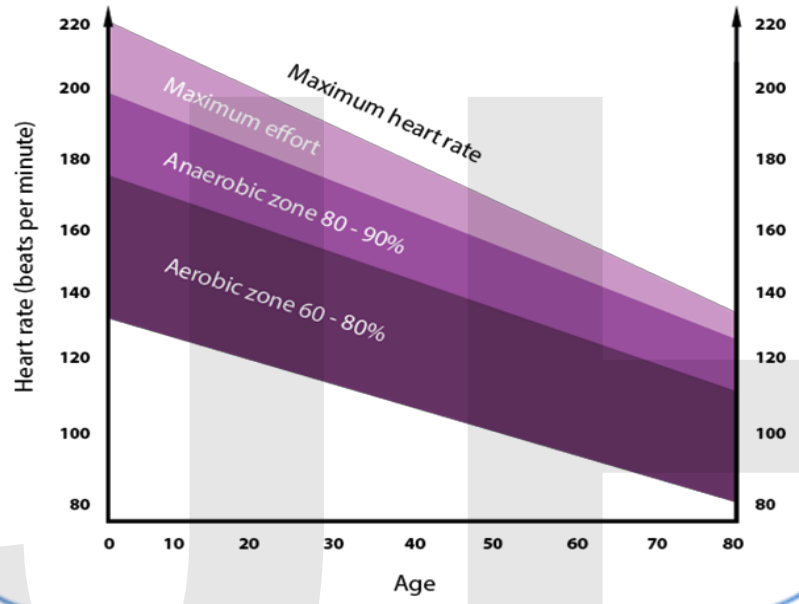
A 20-year-old athlete might want to calculate their maximum heart rate in order to accurately calculate their training threshold:

Maximum heart rate = 220 – 20

Maximum heart rate = 200 beats per minute (bpm)

Once we have calculated the maximum heart rate, we can calculate the training thresholds.

8 Training Zones



11 Warm Up

All warm ups should last a minimum of ten minutes and typically are much longer.

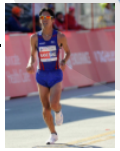
The warm up involves a pulse raising activity, stretching, mobility exercises sport specific activities.

The **pulse** raiser will increase deep muscle temperature, loosen joints and increase **respiratory** and cardiac rates. Stroke volume increases, allowing for greater **oxygen** delivery to the muscles that will work during the performance.

Stretching and mobility exercises increase the range of motion at the joints, increase the extensibility of the muscle and help to reduce the risk of soft tissue injuries, such as sprains and strains.

Sport specific activities involving drills and practices that develop the core skills of the performance. This causes an increased coordination of antagonistic pairs of **muscles**, an increased feeling of confidence and increased coordination between players in team sports.

9 Application of Training Zones



Example 1: A 20-year-old distance runner wants to calculate working intensity within the aerobic zone:

Maximum heart rate = 200

Lower training threshold of the aerobic zone = 60% of maxHR

Lower training threshold = 0.6 × 200

Lower training threshold = 120 bpm

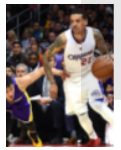
Upper training threshold of the aerobic zone = 80% maxHR

Upper training threshold = 0.8 × 200

Upper training threshold = 160 bpm

Therefore, the 20-year-old aerobic athlete needs to target their training between 120–160 bpm to make the training effective.

10 Application of Training Zones



Example 2: A 35-year-old basketball player wants to calculate working intensity within the anaerobic zone:

Maximum heart rate = 185

Lower training threshold of the anaerobic zone = 80% of maxHR

Lower training threshold = 0.8 × 185

Lower training threshold = 148 bpm

Upper training threshold of the anaerobic zone = 90% maxHR

Upper training threshold = 0.9 × 185

Upper training threshold =167 bpm

Therefore, the 35-year-old anaerobic athlete needs to target their training between 148–167 bpm to make the training effective.

12 Cool Down

Athletes always cool down following training and performance.

Ice baths and massage are techniques that are also used to speed up the recovery process.

The cool down involves light jogging, stretching and refuelling. The light aerobic work allows for the respiratory and cardiac levels to reduce gradually. Core muscle temperature is maintained while capillaries are flushed with oxygenated blood. Lactic acid and other toxins are removed from the worked muscle more efficiently.

Stretches within the cool down are typically held for 30 seconds. As the muscle stretches, blood flow is increased, allowing for faster recovery. Muscles are better prepared for the next training session and soreness and pain experienced after training is reduced.

Consuming carbohydrates, proteins and fluids within the first two hours post-exercise allows for optimal recovery. Carbohydrates replace the glycogen burned during training. Proteins help the adaptation process by allowing muscles and other soft tissues to be rebuilt stronger. Fluids such as water and isotonic drinks allow for rehydration.

Socio-cultural issues in sport and physical activity

1 Participation in sport

Participants in sport and physical activity have individual interests and needs. How they choose to participate – in which sports and what level – reflects these individual preferences.

Individuals are also strongly influenced by social factors. These include:

Age	Gender
Ethnicity	Disability
Religion	Sexuality
Economic status	Family and friends

Some factors have an element of choice. For example, individuals can choose their friends or try to earn more money.Some factors may change over time. Everyone gets older or someone who was non-disabled may develop a disability later in life.

Some factors are beyond an individual's control. People cannot change their ethnicity and children cannot choose their family background.

2 Young people and sport

Statistics on the number of young people taking part in sport and physical activity in the UK vary as there is not a single source of data. A general picture shows that young people's participation is high during curriculum time as physical education (PE) is compulsory. It is lower for extracurricular sport, and it drops dramatically beyond school – during out of school hours and when young people leave school. Overall, young people's participation decreases from age 13.

There are more young people having a variety of experiences and opportunities within schools and their local community, due to a number of different government strategies. The success of these programmes creates expectations and demands that couldn't always be met.

To increase young people's enjoyment of and participation in sport and physical activity, providers need to have a flexible approach and work with young people to find the solutions.

To engage young people. Those who participate in decision-making become more motivated to engage, have ownership over the process and therefore gain in self-esteem as well as personal, social and organisational skills.

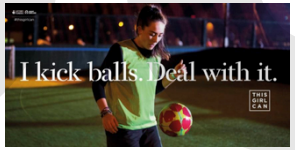
3 Age

Ageing affects people in different ways. There are, though, some age-related trends that can affect participation in sport.

- Children need to develop gross motor skills from an early age to become confident movers.
- Adolescents experience a growth spurt that changes their physical development. This affects how they acquire skills and how they feel, i.e. confidence, self-esteem and body image.
- Women may experience a variety of changes during the menopause, such as weight-gain, aches, anxiety and loss of concentration. This may affect their self-confidence.
- Older people may experience weight-gain and decreasing flexibility and strength, and find it harder to recover from injury. They may lose confidence in their physical abilities.

As part of a healthy lifestyle, physical activity improves these experiences but people may need encouragement or different opportunities to help them to take part.

4 Gender



In the UK, 1.9 million fewer women than men take part in sport each week. There is a significant drop in girls' participation from age 11. By age 14, boys are twice as active as girls.

Individual girls and women have their own reasons for taking or not taking part in sport. Research shows there are some common barriers to participation. Many girls and/or women:

- don't see the relevance of PE and sport to their lives
- think choices in PE and school sport are limited
- dislike taking part with boys or men who monopolise play or who play aggressively
- are more motivated by having fun, making friends and keeping fit than excelling
- feel judged and are therefore embarrassed by how they look
- have less spare time due to childcare and domestic responsibilities
- lack positive role models – locally and nationally
- see that women's sport usually has a lower status and gets less coverage in the media

5 Ethnicity

Over half of the people in black and minority ethnic (BME) communities do no sport or physical activity. On average, all BME groups have lower participation rates than the national average.

One of the main reasons why BME communities have lower rates of participation is the lack of BME role models involved in leading and organising sport. For example:

- only 5% of coaches are from BME communities
- only 7% of sports professionals (other than performers) are from BME communities
- people from BME communities are 50% less likely to be sports volunteers than the general population

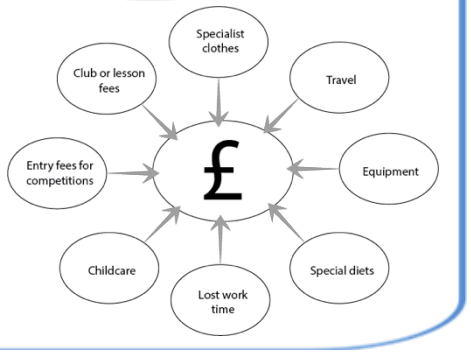
To tackle inequalities in sport, all aspects of sport need to be considered – leadership, management, coaching, officiating and volunteering – as well as actual participation.

6 Economic Status

People's economic status reflects their income (what they earn from work or investments) and their wealth (the land or property they own). Young people's economic status is usually determined by their parents' income and wealth. Frequently, we refer to people's socio-economic status. This recognises the fact that income and wealth influence people's education, occupation and other life experiences. For sports statistics, people are often classified by their employment status.

To increase people's levels of physical activity and improve both their health and well-being and their sporting opportunities, we need to take account of their economic status.

Sport costs money. Sports providers need to be aware of the costs when trying to engage people with lower incomes.



Socio-cultural issues in sport and physical activity

7 Disability

There are around 11 million disabled people in the UK. This includes people with physical, visual and hearing impairments and people with learning difficulties. The participation of disabled people in sport is significantly lower than that of non-disabled people, for all age groups. This is due to:

- physical barriers – for example, a lack of, or the cost of adapted equipment
- logistical – for example, a lack of transport or inappropriate communication
- psychological – for example, lack of confidence, other people's attitudes

Many sports and physical activities do ensure inclusion of disabled people. Inclusion requires staff and volunteers to have a positive attitude, communicate effectively and be able to adapt activities.

8 Paralympic Games

The Paralympic Games is the biggest multi-sport event for disabled athletes in the world. It has helped to change people's perceptions of disabled people. For example, there is more reporting of disability sport in the media and disabled performers have a much higher profile than before. Some disabled sportspeople train and compete with their non-disabled peers.

However, people with learning difficulties and deaf people do not participate in the Paralympic Games. They have their own events and there is still relatively low awareness of their participation.

Paralympians are raising the game for all participants.

9 Profile Popularity and Funding

Sports exist in a competitive world. Individual sports compete against each other to attract participants, coverage and funding, and sport as a recreational activity has to compete against digital pastimes, such as social media, television and gaming. The more people who play a sport, the more likely that sport is to gain funding, either through grants, such as the National Lottery, or sponsorship. Similarly, sports with lots of followers are more likely to attract media coverage and sponsorship.

Research published in 2015 by the Future Foundation, conducted on behalf of the Youth Sport Trust, warned that PE lessons need to use digital technology to make sure that young people are motivated to take part. Other national sports organisations, such as Sport England and sports coach UK, also argue for the need to use technology to attract and retain youth and adult participants in sport.

Technology can help to increase a sports participation and profile. For example:

- **wearable technology –** encourages participants to log their levels of activity, count the calories they burn and log their personal best times
- **game-style apps –** motivate people by setting challenges and rewarding achievements
- **social media –** enables clubs to promote sessions cheaply, individuals to share their experiences or teams to gather support.

10 Ethical Factors

Sport requires people to follow written and unwritten rules to make it fair. It expects them to behave responsibly to ensure respect, fairness and safety. In this way, it promotes social values. This is known as sportsmanship.

Rules- Participants have to follow the rules of the sport. In organised sport, these are developed by each sport's governing body and are upheld by officials during play. Rules make sure that play is safe and fair.

Etiquette- Sport also has unwritten rules or customs – etiquette – to uphold safety, respect and fairness. These help people to play in the 'spirit of the game'.

Deviance- In sport, deviant behaviour occurs when a player; manager; spectator or anyone involved behaves in a way that knowingly breaks the rules or ethics of the sport.

Gamesmanship- Gamesmanship is the opposite of sportsmanship. Without breaking them, players bend the rules and use questionable methods to gain an advantage.

11 Sporting Values

Sport is also used to promote positive values in society generally. By demonstrating these values on and off the field, sportspeople become positive role models, particularly for young people.

The International Olympic Committee (IOC) defines the three Olympic values:
Excellence – someone doing the best they can, in sport and in life. It is about taking part and striving for improvement, not just winning.

Friendship – using sport to develop tolerance and understanding between all people – performers, spectators and citizens in general.

Respect – having consideration for oneself, others and the wider environment. It includes respecting the rules of sport and the officials who uphold them.

12 Anti-Doping

Doping in sport means to take illegal or performance-enhancing drugs. It is a major challenge as it undermines fairness and puts athletes' health at risk.

While there are strict measures to tackle doping in sport, it is the responsibility of every athlete to make sure they are dope-free. Individuals have to take personal responsibility for every substance that enters their body. Anti-doping depends on good sportsmanship.

The UK Anti-Doping Agency promotes 100% Me. This is about being a true athlete where your performance is due to hard work, determination and talent. 100% Me supports and educates all athletes, from beginners to elite performers. It is based on five values: