

## Exam basics

### Unit 1:

- Health and exercise

**Health:** a state of physical, mental and social well-being with the absence of disease.

**Obesity:** a body condition where an individual, for a variety of reasons which may include a lack of good diet and exercise, has excessive body fat.

**Sedentary lifestyles:** characterised by lots of sitting and little activity.

**Benefits of exercise:** physical: losing weight, improved body shape. Social: meet friends, make new friends. Mental: relieve stress, improve self-confidence.

**Negative lifestyle choices:** mental health issues, diabetes, heart issues.

- Diet

Type of nutrient	Component	Example	Purpose
Macro	Carbohydrates	Complex (starch): Rice, pasta, potato, bread. Simple (sugars): fruit & vegetables, biscuits, chocolate, cakes, sweets.	Energy
Macro	Fats	Fatty meats, butter, cheese, nuts.	Energy (at low intensity)
Macro	Protein	Meat, dairy products.	Muscle growth and repair
Micro	Minerals	Calcium: Milk. Iron: spinach.	Strengthen bones Function of blood
Micro	Vitamins	Vitamin C: oranges.	Good vision, skin, red blood cell formation, healing, healthy bones.
Micro	Fibre	Fruit and vegetables.	Pass food through digestive system
	Water	Water.	Hydration

**Carbo- loading:** increasing the amount of carbohydrates consumed prior to a performance or competition; usually a strategy used by endurance athletes.

**Protein diets:** used by athletes who want to develop their muscular strength during training. Will eat high protein diets e.g. chicken, eggs, protein shakes.

- Components of fitness

Health Related	Test	Definition
Cardiovascular fitness	MSFT/12 min cooper run	<u>is</u> the ability to exercise the entire body for long periods of time.
Muscular strength	Hand grip/ 1 rep max	<u>is</u> the amount of force a muscle can exert against a resistance.
Muscular endurance	Abdominal curl/ press up test	<u>is</u> the ability to use the voluntary muscles many times without getting tired.
Flexibility	Sit & reach/ shoulder hyperextension	<u>is</u> the range of movement possible at a joint.
Body Composition	Skin fold callipers/body density	<u>is</u> the percentage of body weight that is fat, muscle and bone.

Skill Related	Test	Definition
Agility	Illinois agility run	<u>is</u> the ability to change the position of the body quickly and to control the movement of the whole body.
Balance	Stork balance	is the ability to retain the centre of mass (gravity) of the body above the base of support either static (stationary) or dynamic (changing) movement.
Coordination	Alternate hand wall toss test	<u>is</u> the ability to use two or more body parts together.
Power	Vertical jump, standing broad jump	<u>is</u> the ability to undertake strength performances quickly. Power = strength x speed
Reaction Time	Ruler drop test	<u>is</u> the time between the presentation of a stimulus and the onset of movement.
Speed	30/50 metre sprint	<u>is</u> the differential rate at which an individual is able to perform a movement or cover a distance in time.

**Other forms of monitoring:** Health questionnaires (PAR-Q), blood pressure, heart rate, BMI

**Reasons for testing:** Identify strengths and weaknesses, set goals, monitor improvements.

• Methods of training

Method	Basic description	Overload
Continuous	Run, swim, cycle, at a steady pace: e.g. 30 min jog. Improves aerobic fitness.	Increase: 1) work time 2) running pace
Circuit	Use of sets & reps/work time (30 sec), work at 'stations'-fitness or skill circuit. e.g. containing exercises such as press-ups, sit-ups, skipping, shuttle runs, bicep curls. Can be tailor made to fitness, sport or individual.	Increase 1) work time at station 2) amount of sets (3 to 4) 3) amount of stations
Fartlek	Means 'speed play', different speeds & terrains- e.g. jog for 5 minutes, sprint for 20 seconds, walk for 2 minutes, jog for 5 minutes (Terrain: flat/up/down hill) Improves speed, cardio-vascular endurance and muscular endurance.	Increase: 1) work time 2) running pace
Interval	Uses sets and reps, work time and rest time. e.g. 8 x 50 metres sprints with walk back rest time. Improves speed and cardio-vascular endurance.	Increase: 1) sets 2) Repetitions
Weight	Use sets & reps, working with machine weights, free weights or own body weight. e.g. bicep curls, squats, bench press, fly's. Improves muscular strength (80- 100%: 6-8 repetitions), muscular endurance (40- 60%: 12-20 reps), muscular power (60- 80%: 8- 12 reps)	Increase: 1) sets 2) Repetitions 3) weight
Plyometrics	Exercises involving jumping, leaping and bounding. Movements are performed explosively e.g. box jumps, burpees.	Increase: 1) sets 2) Repetitions 3) weight

WARM-UP	COOL DOWN
<b>Why:</b> <b>Physical:</b> 1) raise body temperature 2) increase elasticity of muscles and range of movement 3) reduce risk of injury.  <b>Psychological:</b> 1) being 'in the zone' 2) improving focus and motivation.	<b>Why:</b> 1) help prevent soreness & stiffness 2) removal of waste products e.g. lactic acid 3) speed up recovery 4) countering dehydration and the loss of salts.
<b>How:</b> 1. Heart raising: increase intensity to raise heart rate. 2. Stretching & mobility: active/passive/dynamic/ proprioceptive neuromuscular (PNF) 3. Game/activity- specific exercises	<b>How:</b> 1) reduce heart rate and intensity e.g. slow jog 2) stretching & mobility 3) refueling (carbohydrates, water, protein) 4) Recovery: warm bath, ice bath, massage.

• Principles of training

Principle of training SPOV	Description
Specificity	Training to the individual needs or activity, allowing the correct adaptations to take place.
Progression	The development of the training programme, getting more difficult over time.
Overload	Increasing the frequency/intensity/duration of the method of training within a programme. So applying FIT principle.
Variance	Changing/varying training to maintain motivation.
Reversibility	When gains are lost; the consequences of training principles not being applied appropriately.

<b>Heart rate</b>	Is the number of times that the heart beats per minute (BPM).
<b>Resting heart rate</b>	Heart rate at rest, normally between 60-80 bpm. An effect of regular training is a lower resting heart rate.
<b>Working heart rate</b>	Measurement of heart rate during or immediately after exercise. Accurate guide to the intensity (FITT principle) of the exercise.
<b>Maximum heart rate (MHR)</b>	220-age: 204 bpm.
<b>Aerobic zone</b>	60- 80% of maximum heart rate (120- 165 bpm). Means person is working at a worthwhile intensity.
<b>Anaerobic zone</b>	80-100% of maximum heart rate (165-204bpm).
<b>Recovery rate</b>	The measure of how long it takes for a person's heart rate to return to its resting level after a training session. Quicker your recovery rate the fitter you are. An effect of training quicker recovery rate.

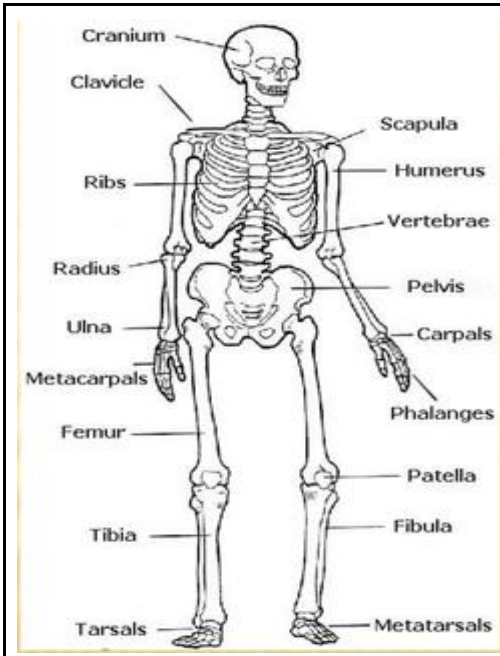
**Unit 2:**

- Muscular-skeletal system

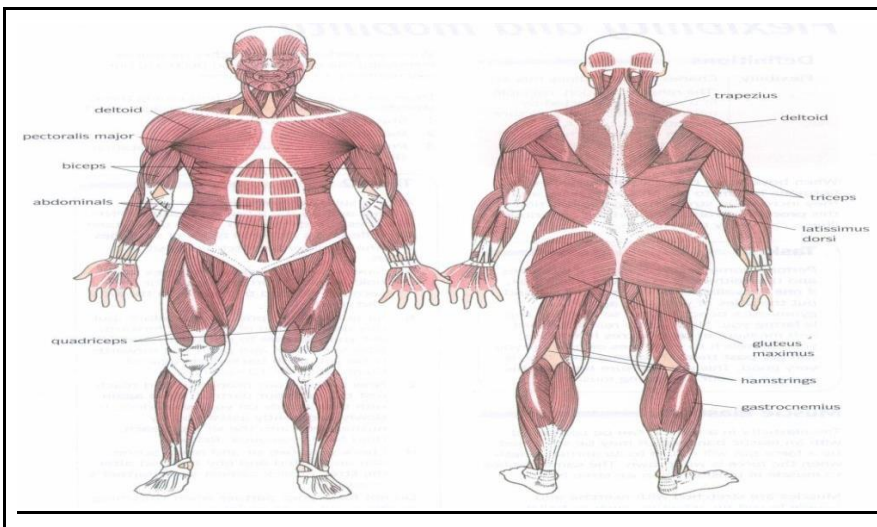
**Tendons:** attach muscle to bone, which allows a lever system to be created.

**Ligaments:** attach bone to bone and give joints stability.

**Skeletal system functions:** movement (bones act as levers), support, protection, production of red blood cells.



Type of synovial joint	Location	Movement possible	Muscles used	Sporting example
Hinge	elbow	Flexion and extension	Bicep and tricep	Bicep curl
Hinge	knee	Flexion and extension	Hamstrings and quadriceps	Bending the knee whilst Kicking a football
Ball and Socket	Shoulder	Flexion, extension, abduction, adduction, circumduction and rotation	Deltoid, pectoral and latissimus dorsi	Throwing the javelin
Ball and Socket	Hip	Flexion, extension, abduction, adduction, circumduction and rotation	Gluteals	Karate kick
Pivot	neck	Slight rotation		Turning head to see ball inn golf/cricket.



**Cardiac muscle:** Only in the heart, Contract and relax continuously, Work without conscious effort from you, Function: double pump.

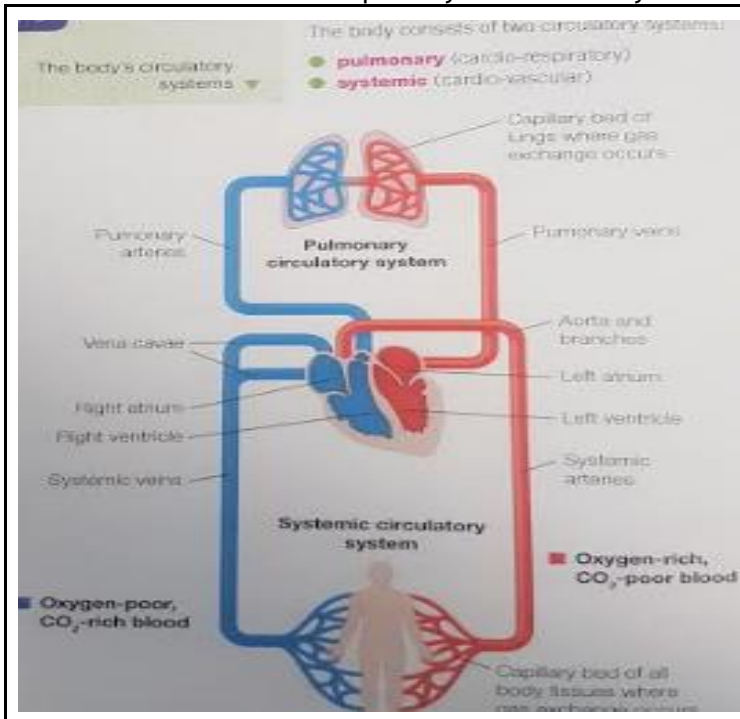
**Involuntary (smooth) muscle:** Around vital organs such as intestines, and blood vessels, Work without conscious effort from you, Function: protect vital organs, regulate movement of the intestine.

**Voluntary (skeletal) muscle:** Attached to the skeleton, Under your control, Example: the biceps, Function: movement, shape and posture.

Muscle	Function	Sporting example	Improved by
Deltoid	Abducts the upper arm, from the body	Serve in tennis	Shoulder press
Trapezius	Rotates the shoulder blades backwards	Rowing	Shoulder shrugs
Lattisimus dorsi	Rotates upper arm at the shoulders	Swimming butterfly	Pull -ups
Pectoral muscle	Adduction of arm	Swimming front crawl	Press-ups
Abdominal muscles	Flexion and rotation of the trunk	Rowing	Sit-ups
Biceps	Flexion of arm at the elbow	Bending the arm to throw a cricket ball	Bicep curls
Triceps	Extension of arm at the elbow	Straighten the arm to throw a cricket ball	Tricep dips
Gluteals	Extension of the upper leg	Running and for maintaining good posture	Squats, lunges
Quadriceps	Extension of the leg at the knee	Kicking a football	Squats, lunges
Hamstrings	Flexion of the leg at the knee	Sprinting when leg bends	Leg curls
Gastrocnemius	Plantar flexion of the foot	Running: pushing onto the toes	Calf raises

**Muscle fibres:** slow twitch (type 1) and fast twitch (type 2)

- Cardio-respiratory and vascular systems



**Pulmonary circulatory system** is the cardio-respiratory system

- Includes: trachea, bronchus, bronchioles, alveoli, diaphragm.
- Transports de-oxygenated blood from the heart to the lungs.
- Re-oxygenate the blood through gaseous exchange in the lungs.
- Remove carbon dioxide from the blood at the lungs.
- Return oxygenated blood to the heart.

**Systemic circulatory system** also known as cardio-vascular system

- Transport oxygenated blood from the left side of the heart to the muscles.
- Supply nutrients to the working muscles.
- Transport de-oxygenated blood from the muscles back to the heart.
- Remove waste products (carbon dioxide and lactic acid) from the muscles.

**Vasodilate:** blood vessels open, **Vasoconstrict:** blood vessels close.

**Thermoregulation:** control of the body's temperature.

**Heart rate:** the number of times the heart beats per minute (bpm).

**Stroke volume:** the amount of blood pumped out of the heart by each ventricle during one contraction.

**Cardiac output:** the amount of blood ejected from the heart in one minute. Cardiac output: stroke volume x heart rate.

**Tidal volume:** is the amount of air inspired and expired with each normal breath at rest or during exercise.

**Vital capacity** is the greatest amount of air that can be made to pass into and out of the lungs by the most forceful inspiration and expiration. Normally this is about 4 to 5 litres.

**Minute ventilation** is the volume of gas inhaled and exhaled in a minute.

**Respiratory rate** is how many breaths you take in a minute.

- Aerobic and anaerobic exercise

Nutrition & exercise: main fuel carbohydrate. Fat another source of energy but only at low intensity.

### Characteristics of the 3 Energy Systems

Energy System	Aerobic/ Anaerobic	Fuel/ Energy Source	By-product	Exercise Intensity	Duration	Sporting Examples	NOTES
ATP/ PC	Anaerobic	ATP/ PC	Creatine	High (Flat Out)	10 – 15 Seconds	Sprinting, athletic field events, weight-lifting.	Small muscular stores of ATP and PC are exhausted quickly leading to a rapid decline in immediate energy.
Lactic Acid	Anaerobic	Glycogen/ Glucose	Pyruvic Acid/ Lactic Acid	High Intensity	Up to 3 minutes	400m/ 800m/ Racket sports.	Lactic acid is a by-product and can cause rapid fatigue.
Aerobic	Aerobic	Fat/ glucose mixture	Water/ CO <sub>2</sub>	Low	3 minutes onwards	Long distance running/ cycling.	This system is limited by availability of O <sub>2</sub>

**Short term effect of exercise:** faster heart rate and increased blood pressure, increased respiratory values, higher body temperature, production of waste products from energy systems.

**Long term effects of exercise:** increased bone density, improved muscular elasticity, greater vital capacity, decreased breathing frequency, reduced blood pressure, lower resting heart rate, less strain on heart, increased muscular hypertrophy.



### Unit 3:

- Muscle contractions

Isotonic	Muscle contraction in which the muscle under tension either shortens or lengthens.
Concentric (isotonic) contraction	Isotonic muscle movement in which <b>a muscle contracts and gets shorter</b> . Concentric contractions are the most common type and occur frequently in sport and daily activities e.g. bending the arm contracts the bicep muscle.
Eccentric (isotonic) contraction	Isotonic muscle movement in which the <b>muscle tightens but lengthens under tension</b> . Eccentric contractions are less common and often involve the control or deceleration of a movement initiated by a concentric action e.g. in kicking a ball, the quadriceps contract concentrically to straighten the knee, while the hamstrings contract eccentrically to control the speed of the lower-leg movement.
Isometric	Muscle contraction where the muscle is under tension but there is no movement.

**Antagonistic muscle actions:** Muscles contract across joints causing movement. Skeletal muscles work in pairs while one muscle contracts the other one relaxes; this is the antagonistic muscle action. The muscle that controls the movement is the agonist or prime mover, whereas the muscle that relaxes is the antagonist.

- Movement analysis

**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:**

**First class lever:** **Example:**

**Second class lever:** **Example:**

**Third class lever:** **Example:**

**Mechanical advantage:** This is where a lever's effort arm is greater than its load arm.  
 **Large loads can be moved with limited effort.**

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

**Planes** – imaginary 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** – imaginary lines that the whole body turns around.

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

- Sport technology

	Advantages	Disadvantages
Athlete	1 Better performance 2 quicker recovery from injury.	1 High cost 2 lack of privacy.
Coaches	1 Information more accurate 2 identifies tactics.	1 Information also needs to be qualitative, encourages reactive approach
Officials	1 Decisions more accurate 2 less pressure on referee	1 Slows game down 2 Not available at all levels
Spectators	1 Improved coverage 2 More information	1 Loss of involvement with actual play 2 Over commercialisation

Unit 4:

- **Goal-setting, mental preparation and motivation**

**Goals should**

Give direction- a way to achieve what is wanted;	Offer milestones on the way to that achievement; help with	Adherence- staying on task to reach the goal; allow	Limitless dreams- encouragement for focus and motivation in order to gain.	<b>Success.</b>
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**SMART targets**

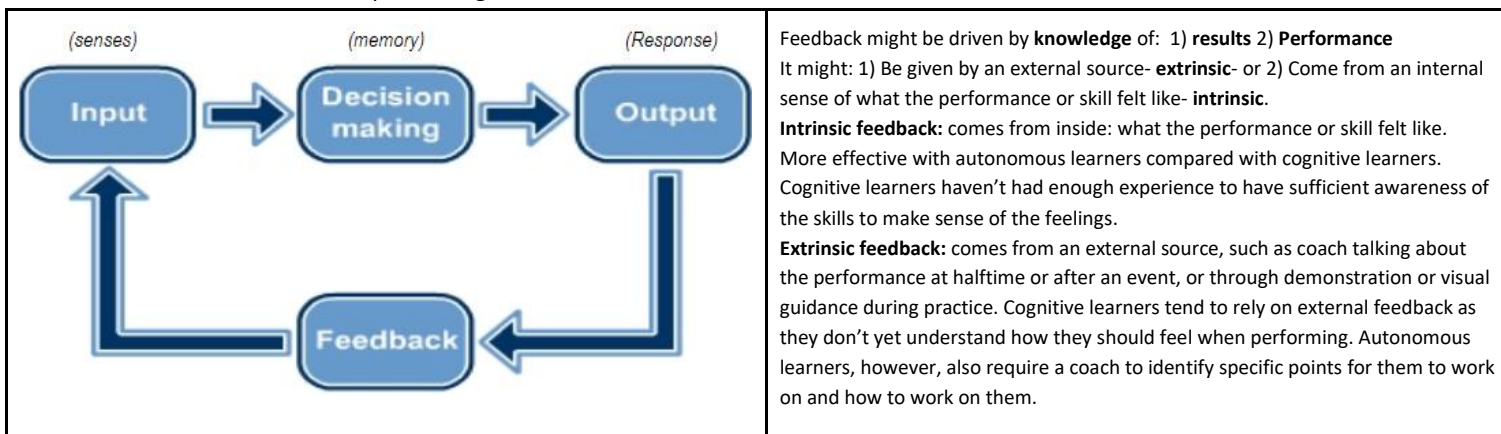
Specific: to the needs of the individual goal.	Measurable: which will give a clear and accurate picture of progress and direction.	Agreed: discussed, shared and accepted e.g. between coach and athlete.	Realistic: achievable, essential for motivation.	Timed: setting a milestone.
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**Mental preparation & motivation:** Being mentally prepared can help an athlete with their motivation to succeed.

This motivation can be: Internal: for the intrinsic nature of it. External: for extrinsic reward (trophies, prize money, recognition).

**Mental preparation techniques** of: Imagery, Visualisation, Mental rehearsal, Can help with: Confidence, Control of emotions, Concentration, commitment.

- Information processing



Feedback might be driven by **knowledge** of: 1) **results** 2) **Performance**  
 It might: 1) Be given by an external source- **extrinsic**- or 2) Come from an internal sense of what the performance or skill felt like- **intrinsic**.  
**Intrinsic feedback:** comes from inside: what the performance or skill felt like. More effective with autonomous learners compared with cognitive learners. Cognitive learners haven't had enough experience to have sufficient awareness of the skills to make sense of the feelings.  
**Extrinsic feedback:** comes from an external source, such as coach talking about the performance at halftime or after an event, or through demonstration or visual guidance during practice. Cognitive learners tend to rely on external feedback as they don't yet understand how they should feel when performing. Autonomous learners, however, also require a coach to identify specific points for them to work on and how to work on them.

Name of guidance	Explanation
Verbal guidance	Given by an observer before, during or after the performance. It needs to be constructive, specific and active so the performer knows exactly what to improve.
Visual guidance	The performer can see the skill being performed or practised. Guidance can show the skill as a whole movement, broken down into steps or applied within a real situation.
Manual guidance	The performer is physically guided or supported by the coach when practising the skill. Provided during practice not performance.
Mechanical guidance	The performer is guided by equipment to support the learner whilst practising the skill.

**Skills:** effectiveness, technique & decision making,

Environment	Complexity	Pace
Open                      closed	Basis                      complex	Self                      external
This continuum classifies skills into how much the environment has an impact on the skill being performed. Open skills have several environmental variables such as: <ul style="list-style-type: none"> <li>● Other performers/ competitors.</li> <li>● Weather conditions.</li> <li>● Spectators.</li> <li>● The venue (pitch surface for example).</li> </ul>	This continuum classifies skills into how difficult they are. The more difficult a skill is to perform, the more complex it is considered. Degrees of difficulty include: <ul style="list-style-type: none"> <li>● Complexity of the movement.</li> <li>● Decision-making and judgements.</li> <li>● Co-ordination and control.</li> <li>● Interpretation of information.</li> </ul>	This continuum classifies skills into who controls the skill being performed. The controls along the continuum include: <ul style="list-style-type: none"> <li>● Who controls the skill.</li> <li>● Decision-making.</li> <li>● Speed of reactions.</li> <li>● Influence of opposition.</li> </ul>

**Stages of learning:** cognitive (beginner) inconsistent, makes mistakes. Associative (developing) understands, becoming consistent. Autonomous (expert) consistent and effective. Practice: whole (full skill, part (bit of skill)), fixed (closed skills lots of repetition), varied (open skills in changing situations)

**Unit 5:**

● **Socio-cultural factors revision notes**

**Participation:** Our reasons for choosing to take part in physical activity and sport are influenced by several social and personal factors, including: personal experiences, family, gender, peers, cost, access, role models.

**Stereotyping**, of individuals and of sports can also influence engagement and opportunities for participation.

<b>Gender:</b> either sex (male or female) when considering social and cultural differences in sport.
<b>Ethnicity:</b> the state of belonging to a social group that has common cultural traditions.
<b>Disability:</b> a physical or mental condition that is 'life-long' and limits a person's daily activities.
<b>Stereotyping:</b> a fixed, oversimplified image of characteristics (of sport and of who should or shouldn't be participating in sport).

Age	Gender	Ethnicity	Disability	Economic issues
<b>School age:</b> Compulsory PE.  <b>Working years:</b> work & family commitments.  <b>Retirement:</b> lack of opportunity.	Men participate more than women.  Teenage years nearly twice as many physically active boys than girls.	Lack of participation in the black and minority ethnic communities (BME). Lack of BME members involved in leading, organising & coaching sport, particularly at elite.	Participation in sport & physical activity by disabled people significantly lower than non-disabled.  <b>Lack of participation due to:</b> <ul style="list-style-type: none"> <li>Physical: lack of appropriate equipment and access.</li> <li>Psychological: low confidence, other people's attitudes.</li> <li>Limited opportunities- insufficient specialist activities, expertise &amp; coaching.</li> </ul>	Socio-economic status can reflect the sport you most likely to play.  Sports with expensive fees & equipment only attract wealthy participants e.g. golf.  Poor health and reduced well being linked to socio-economic status, and is partly a result of lower levels of participation in physical activity.
<b>Lack of participation due to:</b> <ul style="list-style-type: none"> <li>Limited choice of opportunities.</li> <li>Few chances simply participate rather than be competitive.</li> <li>Stereotyping.</li> <li>More coverage of elite male sport.</li> <li>Body image issues.</li> </ul>				

**Physical literacy:** having the skill, confidence, motivation/desire, understanding and opportunities to participate in physical activity.

Types of provision	
<b>Private:</b> exclusive & usually more expensive but with potentially better facilities.	<b>Public:</b> available to all and usually, with some form of government financial support, at lower cost.

Government policies
The government and sports authorities also want to promote reformative and inclusive policies, such as anti-racism campaigns, and improved access for disabled users.
PE in schools is compulsory. It offers children unique experiences and chances to develop physically, mentally and socially and encourages physical literacy and continuity of an active lifestyle outside school & after school.

**Strategies to improve participation in sport and physical activity 1)** Increasing female participation e.g. The girl can 2) Improved provision for people with disabilities e.g. adapted sports and Paralympic movement. 3) Promoting inclusivity and fairplay e.g. anti-racism campaigns: Kick It Out.

**Performance:** Commercialisation in sport is about seeing sport as a commodity that can be bought and sold. Most sports and recreational activities can be seen in the commercial sector as potential ways of making money.

**The Golden Triangle**

**Sport and commerce:** In the commercial world, sport, sports clubs, events, athletes and performers can be seen as commodities.

**Sport and the media**  
Increased media coverage means that more and more sports events and their participants are available to worldwide audiences on a variety of platforms and devices.  
This can be:

- Positive- more people can enjoy a wider range of sports in more detail and become better acquainted with them and their top performers.
- Negative- presenters and journalists and their cameras and microphones can be intrusive, insensitive and sensationalist, pushing the 'story' at the expense of the sport or performance.

Stereotyping, of individuals and of sports or activities, can also influence engagement and opportunities for participation.

**Sportsmanship:** playing to the spirit of the game. **Gamesmanship:** bending rules to gain an unfair advantage.