GLOSSARY FOR GCSE PE OCR EXAM

1 The skeleton

Names of bones	
Cranium, scapula, clavicle, ribs, sternum, vertebrae, humerus, ulna, vertebrae, carpals, metacarpals, phalanges, pelvic girdle, femur, patella, tibia, fibula, tarsals, metatarsals, phalanges.	
Four functions of bones	
Shape & support	Without the skeleton the body would have no framework. It helps determine our shape and size.
Movement	Skeletal joints permit movement as a result of bending or straightening as a result of muscles contracting / relaxing.
Protection	Protects soft tissues such as heart and lungs (ribs), brain (cranium), central nervous system (vertebrae).
Blood production	All bones (especially the long bones) contain bone marrow which is where blood is produced.
Classification of bones	
Flat	Scapula, patella, sternum, pelvis, ribs
Irregular	Vertebrae
Short bones	Bones of hands and feet
Long bones	Bones of arms and legs
Classification of Joints	
Ball & socket	Allow the greatest range of movement (hip & shoulder)
Hinge	Allow extensive flexion and extension, but little rotation (knee and elbow)
Gliding	Permit limited movement (ankle and wrist)
Pivot	Only one in the body formed by atlas and axis at top of spinal column allow rotation of the head
Types of movement	
Flexion	Bending
Extension	Straightening
Abduction	Away from body
Adduction	Towards body
Internal Rotation	Turning in towards body
External Rotation	Turning away from body
Circumduction	Movement in every direction

Synovial Joints	
Synovial joint,	The whole joint (not a totally separate group of joints)
Synovial fluid,	Lubricates the joint
Synovial membrane	Seals the joint
Synovial capsule	Surrounds the whole joint to prevent leakage of fluid
Connective tissue	
Ligament	Connect bone to bone
Tendon	Connect muscle to bone
(Cruciate Ligament)	Found in the knee
Cartilage	
Yellow (elastic)	Structural and elastic. Lower part of nose and in the windpipe
White fibro-cartilage	Tougher, less elastic. Absorbent material between vertebrae.
Hyaline (blue) cartilage	Found at ends of long bones. Smooth and reduces friction where surface rub together.
Injury to joints	
Over-use injuries	Where movements are continually (and often incorrectly) performed.
Impact or twisting injuries	Damage, stretch or rupture ligaments, tendons or joint capsules.

2 Muscles

Names of muscles	
Deltoids, trapezius, pectorals, biceps, triceps, latissimus dorsi, abdominals, gluteals, quadriceps, hamstrings, gastrocnemius.	
Muscle structure & function	
Involuntary muscle	Found in body's internal organs. It is not under our conscious control. (Also known as smooth muscle)
Cardiac Muscle	Found in the heart. It is also involuntary.
Voluntary muscle	Type of muscle that makes us move and is under our conscious control. (Also known as striped or striated)
Movement	
Muscle contraction	Length of muscle shortens Remember: MUSCLES CAN ONLY PULL
Muscle relaxation	Length of muscle is at maximum length.
Antagonistic pairs	Muscles work in pairs; one relaxes and the other contracts
Agonist muscle	The muscle that contracts to produce movement. (Also known as the prime mover)
Antagonist muscle	The muscle that relaxes to produce movement. (Antagonise means to oppose)
Prime mover	(Also known as the agonist muscle)
Synergist	Other 'helper' muscles that either assists the movement of, or stabilises a joint
Origin	The tendon that resists the pull of the muscle (does not move when muscle contracts)
Insertion	The tendon that resists the load against which the muscle is working (moves when muscle contracts)
Connective Tissue	
Ligament	Connect bone to bone
Tendon	Connect muscle to bone
Tendon blood supply	Less efficient than it is to rest of muscle so high risk of injury (good warm up essential)
Muscles for Endurance and Power	
Aerobic	When muscles work with oxygen (Eg Endurance running)
Anaerobic	When muscles work without oxygen (Eg. Sprinting)
Fast twitch fibres	For short term power and strength activities (anaerobic)
Slow twitch fibres	For longer term endurance activities (aerobic)
Training & Exercise	
Atrophy	Muscle wastage caused by a prolonged period of inactivity
Hypertrophy	Greater muscle development caused by regular training and exercise.

3 Circulatory & Respiratory System

Circulatory system	
Consists of…	Heart, blood vessels and blood
Heart	Is a pump. Is a muscle. It has 4 chambers.
Inferior Vena Cava, Superior Vena Cava, Right Atrium, Right Ventricle, Pulmonary Artery, Pulmonary Veins, Left Atrium, Left Ventricle, Aorta. Septum, Cardiac Muscle.	
Respiratory system	
Consists of…	Nasal passage, breathing tubes and lungs
Trachea, Bronchi, Bronchioles, Alveoli. Ribs.	
Circulatory & Respiratory System (as one!)	
The circulatory system and respiratory system must work together. Ie. Without one, the other will not work effectively. Ie. Blood cannot be reoxygenated without a fresh oxygen supply. Both systems capacity can be increased through training.	
Circulation and respiration can both be improved through regular activity and / or training	
Gaseous Exchange	
Gaseous exchange	Involves the exchange of oxygen and carbon dioxide: Oxygen enters blood via lungs Carbon dioxide expelled from blood into lungs
Oxygen uptake	Amount of O2 absorbed by the blood during each breath.
Aerobic Respiration	Uses oxygen and nutrients to produce energy
Anaerobic Respiration	Involves use of stored energy
Blood Vessels – Transport System	
Sequence of system	Lungs → Pulmonary vein → Left atrium → left ventricle → Aorta → Artery → Arterioles → Capillaries → Venules → Veins → Vena Cava → Right Atrium → Right Ventricle → Pulmonary Artery → Lungs
Aorta	Largest artery, found nearest the heart.
Arteries	Collective name for all blood vessels that carry oxygenated blood Away from the heart (A for Away, A for Artery).
Arterioles	Small arteries found near tissues / muscles.
Capillaries	Collective name for Arterioles and Venules.
Venules	Small veins found near tissues / muscles.
Veins	Collective name for all blood vessels that carry deoxygenated blood IN to the heart (IN is in veIN)
Vena cava	Blood in the Superior Vena Cava comes from the upper parts of the body. Blood in the Inferior Vena Cava comes from the lower parts of the body.
Pulmonary	Refers to 'Lungs'

Components of Blood	
Red blood cells	Transport oxygen around the body in the form of oxyheamoglobin
White blood cells	Produce antibodies that kill bacteria
Platelets	Cell fragments which help the blood to clot
Plasma	Mainly water, but carries digested (soluble) foods and hormones
Haemoglobin	Red pigment found in red blood cells. This is the substance that attracts oxygen to the cell.
Blood	
Circulating Blood	Carries nutrients and oxygen to the muscles and waste products to be excreted.
Oxygenated blood	Pumped to the muscles. Arterial blood.
Deoxygenated blood	Returns to the heart and is pumped to the lungs where it is reoxygenated. Venal blood.
Overview of the Bloods' Function	
Transport	Blood transports oxygen from the lungs o the muscles and carbon dioxide back to the lungs
Protection	Blood contains blood clotting agents and white blood cells protect us from infection.
Regulation	Blood helps to regulate the body's temperature – the capillaries near the skin expand / contract in response to heat / cold.
Blood disorders	
Anaemia	Shortage of haemoglobin. Means blood does not carry enough oxygen.
Haemophilia	Shortage or absence of platelets. Means blood can not clot; heal cuts and wounds.
Short Term effects of Exercise	
Short term effects of exercise	The changes seen during participation of an activity. (eg. increased breathing, heart rate, LA build up etc.)
Heart rate	Number of times the heart beats per minute. Increases during exercise.
Respiratory rate	Number of breaths per minute. Increases during exercise.
Lactic acid (build-up)	LA is produced during energy production. It is also a poison and prevents muscles from working efficiently. It builds up in all activities, although far more quickly in activities requiring all-out effort (anaerobic activity).
Oxygen dept	This occurs when the rate at which muscles are required to work is greater than the rate that the body can take in oxygen. Hence, a shortage of oxygen causes muscle fatigue.
Duration	Fatigue develops much more gradually in activities of longer duration and less intensity.
Recovery rate	Recovery from anaerobic activity occurs much more quickly than from extended aerobic activity.

Long Term effects of Exercise on the Circulatory System	
Long term effects of exercise	Changes seen after a period of training. (As below)
Stroke volume (SV)	Amount of blood pumped from the heart in a single beat when resting
Cardiac output (CO)	Total volume of blood pumped from the heart during one minute
Resting heart rate (HR)	The number of times the heart beats when inactive.
List of effects on the heart	Enlargement / strengthening of heart chambers, stronger heart beat, more efficient circulation, lower resting heart rate, increased SV and CO
List of effects (on rest of system)	Increase in number of alveoli, Increased lung capacity, Improved gaseous exchange, improved aerobic capacity, greater volume of oxygen passes into bloodstream
Long Term effects of Exercise on the Respiratory System	
Hypertrophy	Muscles enlarge and grow stronger with continued training.
Atrophy	Muscles get smaller and grow weaker with continued inactivity.
Vital capacity	Volume of air moved in and out in one deep breath.
Tidal volume	Amount of air entering and leaving in each breath.
Oxygen dept	LA is removed from the body in the form of Pyruvic acid. Oxygen is used to break down LA into PA. When LA is produced quicker than it can be removed, there is obviously not enough oxygen available. Hence continued deep breathing after exercise supplies oxygen to remove excess LA. This is called Oxygen dept.
LA Tolerance	It is possible to increase the tolerance of lactic acid by gradually increasing the intensity / duration of activity over a period of time.
Tolerance	The ability to resist the effects of something (Lactic acid)
List of effects	Arteries become larger & more elastic, Blood pressure drops, more RBC (so produce more haemoglobin), lower levels of fat in blood, increased capacity to process lactic acid
Other Important Information	
Aerobic activity	Short, high level activity using no oxygen – rapid accumulation of LA
Anaerobic activity	Longer, lower level of activity using oxygen – less rapid accumulation of LA (oxygen can reduce LA build up).
Mixed activity	When both anaerobic and aerobic activity is used in one sport. Eg team games where continual running maybe followed by a short sprint.
Anaerobic threshold	The point at which you cannot work anaerobically anymore. Anaerobic capacity. Where LA is being produced quicker than it can be removed.
Aerobic Capacity	The point at which you cannot work aerobically anymore. The Threshold. Where LA is being produced quicker than it can be removed.

4 Skill

Skill	
Definition	The learned ability to bring about predetermined results with maximum certainty, often with the minimum outlay of time or energy or both. (Guthrie, 1956)
Key points of skill	A skill is learned. It should become predictable, consistent and efficient
Feedback	
Feedback	Information received by a performer about performance (either during or after a performance).
Intrinsic feedback	Comes from within the performer
Extrinsic feedback	Comes from others (eg. teacher or coach) It should be brief (1 or 2 points) so not confusing Given during or soon afterwards
Knowledge of Performance (KP)	Involves analysing and thus how to improve performance Can be intrinsic, but more likely extrinsic (eg. coach or video analysis) Results are not important – even a successful performance can be improved.
Knowledge of Results (KP)	Comes from external source eg. result of game (football) or judges score (Diving or gym)
Open & closed skills	
Environment	IMPORTANT NOTE: Does not just refer to the weather Also refers to everything around you Ie. other players, pitch, referees, etc
Open Skills	Need to be constantly adapted during performance Performance environment may change (perceptual) Team games require open skills
Closed Skills	Require little or no adjustment during performance Once learned, remain the same (habitual) May require great deal of practice to perfect them The performance environment is relatively stable.
Eg. Pole vault takes place outside, but the weather has little affect, as the skill is the same almost every time it is performed. Hence, it is a closed skill (because the performance environment is the same).	

Skill & Ability	
Speed	Ability of a performer to move quickly
Reaction time	Speed of response to a stimulus; reaction time and speed of movement are linked
Agility	Ability to move quickly and control and change the point of balance
Co-ordination	Ability to control and link different movements in a sequence or skill
Flexibility	Ability to stretch and bend to maximise the range of movement at joints
Balance	Ability to maintain balance when moving or standing still
Different levels of skill	
Novice performer	Inconsistent – performing a skill differently each time Inefficient in energy expenditure & ineffective as a performer Unable to perform a skill quickly (eg caught in possession) Unable to adapt a skill (ie. When to use a specific skill)
Top level performer	Demonstrate a high level of consistency Performs with apparently little energy or effort Performs a skill quickly and efficiently Adapts skill to meet the demands of the situation
Learning & developing skill	
Simple skills (whole learning)	Simple skills can be learned as a whole unit
Complex skills (part learning)	Some skills need to be broken down into smaller parts Eg. lay up = dribble, pick-up, lay-up strides, jump & release
Demonstrating & copying	Skills can be learned by copying others who are a good technical model. A demo should be followed by immediate feedback Live or video performance can be used for demos
Practice	'Perfect practice makes perfect' A good demo is essential Both intrinsic and extrinsic feedback must be available Practice can be based on a whole skill or part of a skill
Trial and error	Doing something until you happen to hit on a way that makes it work Bad habits can be difficult to break later.
Role models	Stars in sport can be very useful in demonstrating a skill The role model needs to be technically correct A good role model will also promote sporting values in their conduct both on and off field.

Learning skills: Information processing	
Input	The performer considers 'what is happening?' Eg. speed of ball, position of opponent etc
Decision-making	Based on the above and pervious experience, the performer must decide how to respond
Output	This refers to executing the decision
Feedback	Having performed the selected skill, the performer will receive information about it. (intrinsic, extrinsic, KP, KR) (This info will be added to that already stored in the memory and should influence any future decisions)
Evaluation and analysis	
Evaluation and analysis	Watching a performance and identifying strengths and weaknesses.
Planning	It is important to plan for improvement – How can we improve performance?
Skill-learning process	Provider of feedback needs to know how relevant skills are learned and improved
Sport-specific skills	Provider of feedback should have details knowledge of the skills under scrutiny (ie. group/team or individual skills)
Sport-specific fitness,	Provider of feedback must have activity-specific fitness knowledge
Sport-specific tactics and strategies	Provider of feedback must know about the specific tactics and strategies of the game or activity
Consistency, Adaptability, Time, Energy (CATE)	
Consistency	Ability to perform the skill the same each time
Adaptability	Ability to choose the correct skill and change it were necessary (to meet the demands of the situation)
Time	The duration it takes to complete the skill
Energy	The fuelling costs to perform a skill

5 Motivation & Mental Preparation

MENTAL PREPARATION	
Mental preparation	Split into three areas; Relaxation, mental rehearsal & focusing
Relaxation	
Relaxation	Should involve both physical and mental relaxation
Physical relaxation	Massage & manipulation techniques Reduces muscle tension that builds up before competition
Mental relaxation	Playing calming music, meditation, quiet talking to coach or friend or going for a walk
'Self-talk'	Used to describe the performer going through a prepared routine of self-communication, both prior to and during.
Mental rehearsal	
Mental imagery	Ability to picture what a skill should look like when performed well (also useful in learning process).
	Picture specific skills or key aspects of performance.
	Used in preparation for big competitions.
	Aids in building performers confidence.
Focusing	
Focusing	Involves focusing on key points of a technique
	The performer should feel free from distractions.

MOTIVIATION	
Motivation	Motivation is the desire to perform well
	Split into three areas; Intrinsic, extrinsic, arousal & over-arousal
Intrinsic Motivation	
Intrinsic Motivation	This is self-motivation and involves;
	Desire to participate for your own personal reasons
	Desire to participate for fun and fitness
	Enjoying playing with friends or as part of a team.
Extrinsic Motivation	
Extrinsic Motivation	Comes from outside our own personal drives and involves;
	Winning cups, trophies and medals
	High salaries and prize money
	Personal glory, fame and status

Arousal	
Arousal	State of readiness in a performer
	Motivation is an effective way of stimulating arousal
	Coaches 'psych up' their team before a match
	Cup finals, prize money, gold medals and media contracts are guaranteed to raise arousal levels
Over-arousal	
Over-arousal	Some performers are all too easily aroused – this can cause problems!
	Mike Tyson has a reputation for 'losing it', ear biting and, more recently, fighting at a pre-contest promotion with Lennox Lewis.

GOAL SETTING	
Goal setting	A process whereby achievable goals are agreed by you and your coach in order to improve your performance.
S Specific	Goals must be clear and precise
M Measurable	Must be a standard against which progress can be measured
A Accepted	Goal must be agreed by performer and coach
R Realistic	Goals or targets must be realistically achievable
T Time-related	A specific time span gives added focus
E Exciting	Motivating and interesting
R Recorded	Progress should be measured and recoirded.
Types of Goal	
There are two main types of goals: Process goals & target goals	
Process goals	Process goals usually relate to an aspect of performance. This might be a specific technique or skill
	A sprinter who is slow out of the blocks might logically set a process goal related to the improvement of explosive speed or acceleration.
Target goals	Target goals identify specific targets in overall performance.
	This might be an 800m runner wanting to improve a personal best performance by a specific amount, or a cricketer wanting to improve his or her batting average.

6 Social Reasons for Participation

Increased leisure time	
Increased leisure time	Ordinary people now have far more leisure time than ever before. Reasons include:
Shorter working week, technological advances, early retirement, unemployment	
Shorter working week	
Shorter working week	Many people now work 37 hours or less
	Many people work part time
	Flexible shift patterns and extended weekends often provide large periods of recreation time.
Technological Advances	
Technological Advances	These have contributed to a shorter working week
	Many people can now work from home
	Wide ownership of personal transport allows a more effective use od leisure time
Negative aspects;	Work is far less physically demanding
	Unemployment
	A more sedentary lifestyle
	Effects on general levels of health fitness
Early Retirement	
Early Retirement	Retirement allows an increasingly large group of people the freedom and opportunity to pursue new or existing recreational pursuits
	Many retired and early retired groups have far more disposable income that previous generations
Unemployment	
Unemployment	Unemployment create 'free time' which can be used for affordable recreation.

Why people participate	
Health	There is an increasing level of concern about health
	Many people exercise in order to avoid stress
	Many jobs involve little or no physical activity, so that regular exercise ensures a reasonable level of fitness
	Some people use exercise to aid recovery from illness or injury
	Some people are concerned about their physical image
Leisure and enjoyment	Many people participate in physical activity simply because they enjoy it
	The right to recreation has become the norm in most free societies, irrespective of class or privilege
	Friendships develop through recreational and/or sporting experiences
	Leisure (or enjoyment) is no longer considered frivolous or a waste of time.
	For some people, physical recreation serves as an extension to social activity.
	Physical activities or recreations can also be hobbies
	Enjoyment of physical activity may or may not include activity of a sporting or competitive nature.
	The recent increase in popularity of gyms and health clubs also provides an indication that exercise and fitness are now seen as important. It is fashionable to be fit!
Vocation	There are those who are professional performers and others who have careers as coaches, fitness trainers, physiotherapists and recreational and sports development officers.
	PE teachers have traditionally been one of a very few professional groups paid to teach sport.
	Some sports have part-time professionals who also have full- or part- times jobs
	Many clubs now have full-time secretaries, commercial managers and administrative staff.
	Organisations such as UK sport, Sport England and other bodies employ support staff.

7 School

National curriculum	
Created by…	The government
Purpose	Advises schools what must be taught in primary and secondary schools
In PE	Sets out aims, standards and a range of activity guidelines.
	It has 6 areas; games, dance, swimming, athletics, outdoor adventurous activities and gymnastics.
	It also teaches vital information about health, lifestyle and working with others.
Examination courses	
In PE	GCSE, GNVQ, AS, A2, NVQ and Btech course are available
	There are also degree courses
	Combines theory and practical work and, like normal PE, must meet National Curriculum requirements.
Extra-curricular activities	
In addition to National Curriculum requirements	Usually out of school time – during lunchtimes, after school, at weekends or during school holidays.
	House / school teams, recreational clubs, skiing and sports trips, Duke of Edinburgh and Sports Leaders Awards.
	Tens of thousands of young people benefit from their early experiences in school sports and recreations – activities that often remain part of their lives for many years afterwards.
Links with local clubs and sports providers	
Develop in a variety of ways	
Teachers and parents may be members of clubs and encourage young people to join.	
Schools often make use of off-site facilities for squash, swimming or rock climbing, helping to introduce students to recreational opportunities available in their local community and elsewhere.	
A school trip or a link with a local sailing club may stimulate a lifelong interest.	
It is now common practice for school facilities to be made available to local clubs and an increasing number of school sports facilities are utilised as community sports centres.	
A network of school sports Co-ordinators based in sports colleges has recently been created, with responsibility for developing links between school and outside sporting organisations.	

8 Social Background

Access	
	Whilst for many people wide-ranging sporting and recreational facilities are becoming more commonplace, there are still those for whom provision is either limited or non-existent.
Restrictions	Access to recreation is limited by free time and the **nature (or amount) of facility** provision.
	Access can be restricted or improved as a result of **personal wealth** (or lack of it).
	Levels of public or **municipal provision** greatly influence the degree of access available to ordinary people.
Multi-use V availability	The degree to which existing facilities are available for 'multi-use' (eg. sports facilities in schools) also affects levels of access for a number of different social groups.
Deprived groups	Some groups, including ethnic minorities, the aged, disability groups and those in deprived areas are still less likely to have the same access to facilities as more mainstream groups.
Money	Some facilities, including swimming and other water-based activities, are very expensive to build and operate.
Limited access / private	Some facilities are private and access is limited to those who can afford high membership and subscription fees.
The important issues for most people are	What is local? What is available? What is affordable?
Age	
Number of people	The number of old people in the population is growing rapidly and this will influence the nature of facility provision in the future.
Not included	Older people have not previously figured in plans for facility provision.
Benefits of recreation	Older people are becoming increasingly aware of the benefits of active recreation in terms of health.
	Older people are no longer prepared to accept that active recreations are not for them.
	Society is being forced to change its views on older people and active recreations.
Financially better-off	Many people who are currently retired are far better off financially than previous generations of old people.

Disability	
	Athletes with disability – not disabled athletes!
	Disability sport – not disabled sport!
	Disability sport has fought an uphill battle against lack of provision for athletes.
	Society used to hold the view that disable people had no need to take part in sport and recreation.
	In the last 20 years disability sport has grown rapidly and forced society to change its views.
	Disability sport is not accepted as a valid form of physical activity.
Education	
	The most obvious contribution education can make is in encouraging young people to take up activities while they are young.
	As an increasing number of young people continue their education beyond the age of 16, colleges and universities can play an increasingly significant part in promoting active recreations.
	Adult education classes and / or provide facilities for recreational and sporting activities.
	Education also helps to form and reinforce attitudes to participation.
	It is also a process that teaches young people about shared responsibility, equality of opportunity and the tolerance of cultural differences.
	Physical activity in schools is important as it influences future lifetime habits.
There are current issues that adversely affect the ability of schools to provide such opportunities and experiences, such as;	• Playing fields being sold off by local authorities • PE time being reduced to allow increased time for other subjects • Reduced staffing to cut costs • Teachers who are so busy that they have less time to give to extra-curricular activities.
Environment / Climate	
	The physical environment in which people alive has a significant effect on the nature of their sports and recreations.
	In some parts of the world, the climate is so extreme that certain activities (eg. winter sports) develop very strongly.
	At the same time, many other activities are simply not suitable.
	Physical features (eg. extended coastline or rugged

	mountainous terrain) encourage certain activities which cannot be practised in areas not possessing these features.
	Britain has an extensive coastline so that sailing has always been popular; this is also the case in France and other countries whose boundaries include extensive coastlines.
	Technology now allows some sporting environments to be created artificially, making it possible for some activities to place in areas where they could not normally do so.
	The point above does not apply to those countries who simply cannot afford to take advantage of such developments
	The most popular sports in most cultures (at non-elite level) are those that take place in their natural environment.
	In the UK we live on an Island that has a temperate climate capable of sustaining many sports and recreations .
	We do not, however normally have summer that will allow uninterrupted summer sports, nor winters that will support, for example, a sustained winter sports season, as is the case in some other European countries.
Family	
	For many people, their earliest experiences occur within a family environment.
	Parental or extended family involvement in sport can be a major influence on young people
	Family holidays are sometimes based on sporting / recreational activities in which all are involved
	Young people growing with positive experiences are more likely to develop an interest in such activities themselves.
	Even when there is no direct parental involvement, any interest shown in their children's activities has a positive effect on how young people feel about their own participation.
	Where parents give little support, it is less likely that an interest in sport will develop unless other factors (eg. school or friends) exert a more positive influence.
Gender	
	In most cultures, the argument that girls and women belong in the home and have no place on the sports field is no longer considered valid.
	Former excuses included 'they aren't strong enough' or 'it just isn't ladylike'
	Girls and women now participate in activities previously

	considered to be suitable only for men.
	In most cultures, women no longer need 'male permission' to participate in sport and recreation.
	Significant obstacles still exist in some cultures, largely because of religious and / or political beliefs.
	There remains a more general objection to women's participation in certain activities (eg. boxing)
	Where young girls (or boys) are concerned, the issue should be whether boxing is a desirable activity.
The Media	
	Today's media exerts a greater influence than ever on sport.
	TV companies exert a major influence on major sporting events in order to market their advertisers' products
	Sports start now have a very high profile and exert a more powerful influence as role models than some pop stars.
	The nature of media coverage can influence public opinion on sport related topics.
	The abundance of printed and electronic media means tat few do not come into regular contact with media reportage.
	Much more of this is not necessarily the kind of exposure that sports organisations would prefer, but it does ensure that sport has a very high profile, which can act as a spur to people to become involved in sport themselves.
Peer Group	
	Peer group is a major factor in the lifestyles of young people, who are strongly influenced by the interests and activities of their friends
	It takes considerable strength of character to refuse the just ' follow the crowd'.
	Many of today's leisure-time activities centre around the television, computer games or pop music, none of which are ideal ways to promote a healthy lifestyle.
Politics	
Emergence of Eastern European Athletics	The 1960s saw the emergence of Eastern European athletes who were almost unbeatable.
	One of the ways in which they had become successful was by ensuring that everyone had an opportunity to play games and sports from a very early age.
	This was possible because of direct (central) government funding.
Emergence of other country's sport	France was the first western European country to copy this centralised approach.

	This is often referred to as mass participation or Sport for All.
	Most other countries, including Britain & USA, had rather haphazard systems of sports facility provision (ie. De-centralised approach).
	These systems involved little or no government funding.
Control in UK today	Funding from the National Lottery and the restructuring of the UK sports councils have begun to have some effect.
	Many decisions on the nature of facility provision are still taken at local level.
Funding for sport	Political views can influence the nature of provision within any given country.
	In the former Soviet Union, everything was funded by the state and financed by the revenue from taxes.
	In the USA, sport and recreation is funded only minimally by state and/or federal authorities.
	In many countries, funding and facilities are provided by a mixture of government, private and sometimes voluntary (or charitable) organisations.
Poverty	
Who is affected?	Poverty can affect whole countries or particular areas.
	Where poverty exists, individuals, families and communities may well have other priorities than recreation or sport.
Abroad	Governments in very poor countries (eg. Argentina and Kenya) find it almost impossible to make any provision for sport at any level.
In the UK	In the UK, the Active Communities programme, sponsored by Sport England, encourages deprived and ethnic minority groups to apply for funding in order to develop facilities locally.
Sponsorship	
Sponsorship is 'the funding of sporting activity for commercial gain'.	
Who is responsible for sponsorship?	The Institute of Sports Sponsorship is now jointly responsible with the Central Council of Physical Recreation (CCPR) for sponsorship matters in the UK.
	Together, they form the Sports Sponsorship Advisory Service (SSAS)
	The purpose of the SASS is to develop sport by means of commercial sponsorship
	One of the products of this relationship is 'Sportsmatch', which encourages grass-roots sport by doubling any amount raised locally by sporting organisations.

	The Active Communities Development Fund is another scheme designed to help particularly those groups in socially deprived areas to provide facilities where none exist.
Where does it go?	Some corporate sponsorship helps grass-roots sport.
	Much of the funding from sponsorship goes straight to professional sports and does not always reach sport at grass-roots level.
Tradition and Culture	
Tradition and culture have been the foundation of most sports and also the cause of access being denied to many people.	
How sports are formed	Cultures and traditions change and the way that sport is perceived will also change with them
	Ancient games and festivals have produced the basis of most of today's sports
	Games and sports change with the cultures in which they exist
Victorian England	The raucous 'mob' games of nineteenth-century England were either constrained or banned by a strict Victorian morality
	This Victorian morality also looked down on professional sport and promoted the values of amateur competition
Women today	In many cultures women have been consistently denied access to sport and physical recreation
	The first Islamic Women's Games was held as recently as 1993.
	27 countries did not send women competitors to the Olympic Games in 1996, by 2000 this had fallen to 9 countries
	Cultural traditions and values differ markedly in different parts of the world and this includes attitudes to sport.

9 Local and National Facilities

Provision and opportunity	
	Do adequate facilities exist locally and nationally?
	Facilities are expensive to build and maintain
	Are people able to use them?
	Even where facilities exist, they must be reachable, affordable and appropriate for the type of user
	Some facilities will always be difficult to provide for use locally and at grass-roots level (eg. water and mountain-based activities), as will other activities that require the use of expensive equipment and/remote terrain

	In order to maximise the effects that the provision of facilities has upon overall participation levels, it is necessary to consider the joint use of facilities at both local / national and grass-roots/elite levels
	Some provision must be made for elite performers who require specialised facilities
	Some of these facilities may also be available for use by local groups / school when not required for their primary purpose by elite performers
Major providers of local authorities are:	The local authority Private enterprise Private and voluntary clubs and associations
Local Provision	
Local authority provides and maintains	Public parks Public playing fields Public swimming pools Sports facilities in schools Local sports centres Local youth centres
	Many local facilities are used jointly by schools and other community groups
	Some local authorities also help to fund facilities such as athletics tracks, outdoor pursuits centres and water sports centres
	Youth centres are often sited on, or adjacent to, school campuses in order to facilitate the joint use of many facilities as possible
Private enterprise	An increasing range of recreational and sporting facilities are now provided by private business ventures for whom profit is a major motive

	These tend to be private health an sports clubs offering executive-style facilities for squash, tennis, fitness and health suites and private swimming facilities
	Such facilities are normally beyond the reach of those earning less than above average incomes
	Many of these clubs now have several branches in different parts of the country, rather like a series of department stores, each contributing to the profit of the parent company
	These clubs do not usually cater for large team games as the cost of acquiring and maintaining large outdoor playing areas would be unprofitable
Private enterprise, private and voluntary clubs and associations	There is a clear distinction between private clubs that are run as businesses (see above) and private non-profit-making clubs run by committees for the benefit of their members
	Most of the officers of these clubs work on a voluntary basis
	Some larger establishments such as golf clubs may have some full-time paid officials, but this is usually because the work-load requires full-time attention
	These clubs are normally owned by their members or are held in trust
	They are not owned by private investors or shareholders
	Many of these clubs do cater for outdoor team games and some of them have considerable histories
	Some of them make considerable efforts to enable ordinary people to join whilst others do not
National Provision	
This provision embraces a wide range of activities, form sport to public pathways, ancient buildings and sites of outstanding natural beauty	
This is the responsibility of bodies such as:	The Countryside Agency The Environmental Agency English Heritage The National Trust
The Department of Culture, Media and Sport also has overall responsibility for	Museums The arts Sport Education Broadcasting and the media Galleries and libraries Ancient buildings and monuments Tourism The National Lottery Creative industries

National Lottery funding going to sport	Controlled by the Department of Cultures, Media and Sport and the appropriate Sports Councils in England, Northern Ireland, Scotland and Wales, or through UK sport
	This is slowly changing and recent restructuring of sports councils, together with the availability of National Lottery Funding, is slowly helping to change old attitudes
	UK Sport now concerns itself with Great Britain matters, whiles the sports councils of the four home countries administer sport within each of their own areas
Other countries have for some time been developing facilities for sport using public funding:	
Australia	Major facilities are developed using a combination of state funding and private sponsorship
France	The stadium for the 1998 World Cup Competition was entirely funded by the state
Other European countries	Many of the major football stadia are municipally owned and rented to clubs for major league and cup games
National centres of excellence	
	Following the review of sports councils and the creation of the United Kingdom Institute of sport, this structure now includes national and regional centres of excellence
	Existing national sports centres may house some national centres of excellence, whilst other sport may be based at other venues with excellent facilities
	A centre of excellence may have national or regional status, but in some cases it may have both, eg. Lilleshall is the national centre of excellence for gymnastics and so serves as the West Midlands regional centre
	Some national centres of excellence (eg. swimming at the University of Bath) re not national sports centres but have very good facilities for a particular sport
	Another example of this is the national centre of excellence for cycling at Sports City in Manchester
National Sports Centres are situated at:	Crystal Palace (south-east London) Bisham Abbey (Buckinghamshire) Holme Pierrepoint (Nottinghamshire) Lilleshall (Shropshire) Plas y Brenin (North Wales)

Sports Institutes	
Sports institutes	Work on the principle of housing specialist facilities, coaching, medical support and organisational infrastructure in a small number of well-equipped, well funded centres
France	Adopted this structure after Olympic failure in Rome in 1960
Australia	Did likewise following poor results in Montreal in 1976
UK	The UK Institute of Sport was set up following poor performances in Atlanta in 1996
	The current structure in the UK is administered by UK Sport, which is the senior sports authority in the UK following the restructuring of the former sports Council in 1997
	The sports council for each of the four 'home' countries will look after its own sports institute in matters which are not UK or GB related
	The English Institute of Sport has a network of regional centres
	Northern Ireland, Scotland and Wales are developing their own structures centred at Ulster, Stirling and Cardiff respectively
	The network centres of each of the four home countries will make up the United Kingdom Sports Institutes (UKSI)
The regional centres in England are:	North West (Manchester Yorkshire (Sheffield) East (University of East Anglia) East Midlands (Holme Pierrepoint) West Midlands (Lilleshall) South East (Crystal Palace) South (Bisham Abbey) South West (Bath University) North (Gateshead) South Coast (Southampton)
The current Sport England slogan is 'More medals, more people, more places'	
Whiles medals are important, it is also essential to have many active participants as possible	
Sporting success is more likely if the top performers are chosen from a wide selection base	
Funding must therefore be targeted at grass-roots level as well as elite sports groups	
This is not only helps win gold medals, but creates a healthier nation.	

10 Components of Fitness

HEALTH-REALTED FITNESS

CARDIOVASCULAR ENDURANCE	
Cardio	Heart
Vascular	Blood vessels
Definition	Capacity of the heart and circulatory system to meet the demands of a sustained activity
Use	All events but especially long duration activities
How to improve	Long-term training that produces an increase in the size of the heart muscles (hypertrophy)
Cardiac Hypertrophy	Greater the size of the heart the greater volume of blood can be pumped around the body
Cardiac Output	In a trained athlete amount of blood pumped from the heart in a min can rise to eight times its normal level.
MUSCULAR ENDURANCE	
Definition	Capacity of the muscles to perform contractions at near maximum level for an extended period
Use	Activities where power must be applied for a sustained period
How to improve	Dependant upon good lactic acid removal
SPEED	
Definition	The time taken to move
Use	(Related to strength activities, eg sprinting)
How to improve	By moving more efficiently (and also through training)
	Not just about how fast a person can run eg speed of arm in throwing
STRENGTH	
Definition	Maximum force that can be developed within a muscle during a single maximal contraction (all-out effort)
Use	Most activities require a degree of strength
How to improve	Increasing loads in training
FLEXIBILITY	
Definition	The range of movement possible at a single joint or at a number of joints
Use	In all activities (not just gym) to reduce chance of injury
How to improve	Inactivity is the greatest cause of loss of flexibility
	The elasticity of ligaments, tendon and muscle attachments

SKILL-REALTED FITNESS

AGILITY	
Definition	The ability to move in a controlled way and to turn, stop and start quickly
Use	All activities that require active movement
How to improve	Control / adjustment of the body rather than flexibility
BALANCE	
Definition	The control of our centre of mass in relation to our base of support
Use	Important for everyday things as well as it is in sport
CO-ORDINATION	
Definition	Interaction between the body's nervous system and the motor (movement) system. ie (link between brain and body parts)
Use	Essential for the successful execution of many skills
How to improve	It is an innate ability (you are born with it) but can be improved through work on specific skills
SPEED OF REACTION	
Reaction time	The time between the initial stimulus and the initial response
Movement time	The time between the initiation of a response and the completion of the resultant movement
Response time	The total amount of time between from the initial stimulus, a response and the completion of that response
TIMING	
Definition	Concerns the execution of a movement at the appropriate time and in the most effective way (eg. timing a pass)
How to improve	It can be influenced by other skill-related components AND perception of what is going on around us (eg opponents, ball moving etc)
Important note	Not always to do with speed

11 Factors affecting Fitness

DIET	
Carbohydrates	• Our diet comprises of 60% Carbohydrates • High in glucose (energy) and stored in liver and kidneys. • Most readily available form of energy • Important for endurance as need large stores of energy • Eating large quantities is referred to as Carbo-loading
Protein	• Our diet comprises of 15% Protein • This supplies 10% of our daily energy requirement • Assists tissue growth and blood haemoglobin levels • Found in red meat, dairy products, fish, poultry and beans
Fats	• Our diet comprises of 20% Fat • This supplies 70% of our daily energy requirement • Fat is the body's preferred energy source (in endurance)
Minerals	Required for building tissue: • Calcium – forms bones & teeth • Sodium – regulates body fluids • Iron – Helps transport oxygen by the red blood cells • Iodine – used to form hormones
Vitamins	Vitamins occur in two main groups: • Fat soluble – A,D,E,K • Water soluble – B,C
Fibre	• Regulates the digestive system • Helps retain water • Important components in removal of waste products
Water	• Helps remove unabsorbed food and other waste products • Essential for body's chemical reactions • Assists turning stored fat into energy • Reduces sodium build-up in the body • Maintains muscle tone
PHYSICAL DIFFERENCES	
Body types	For certain sports a particular body type is advantageous The three main body types are classified as:
Ectomorph	Slightly build, narrow shoulders and hips and often long limbs
Endomorph	Round or 'pear-drop' shape with narrow shoulders & broad hips
Mesomorph	Typical 'athletic build'; broad shoulders, narrow hips well developed chest
Height and weight	Particularly significant in some sporting activities Tall people have advantage in some activities but not others Mobility and speed are affected by weight and size Size advantage is minimised in sports where there are weight classes eg. Wrestling and boxing Men should not have more than 20% body fat and women 30%

AGE, GENDER & DISABILITY	
Age	Strength decreases but endurance can be maintained; speed and reactions slow but can be delayed through exercise; Bones become brittle; Our bodies slow down with age; number of older people involved in sport is growing
Gender	Females are not as physically strong Females often perform better in endurance events which may be linked to their greater fat content
Disability	Social prejudices have changed markedly. Technology aids participation. Disability sport is now becoming mainstream
LIFESTYLE INFLUENCES	
Smoking	At one time socially acceptable but now no longer so Maybe due to being more informed of harmful effects
Advantages	Reduce stress
Disadvantages	Increases likelihood of heart malfunction & thrombosis Damages lungs - reduces efficiency of gaseous exchange Reduces oxygen-carrying capacity of the blood
Alcohol	Considered far more socially acceptable than smoking
Advantages	Artificially steady nerves Delay or mask feelings of tiredness / exhaustion
Disadvantages	Dehydration. Slower heart rate creating unfair advantage Possible liver damage Slower reaction time and false assessment of risky situations
Eating disorders	Term 'eating disorder' is an illness rather than result of poor diet. Affect general health and well-being Affect active sports people who have emphasis placed on body shape
Anorexia Nervosa	Self-imposed starvation
Bulimia Nervosa	Sufferers have poor self-image; Binge eating followed by self-induced vomiting
PERFORMANCE ENHANCING DRUGS	
Usually taken knowingly to gain unfair advantage over opponents.	
Stimulants	Most common ones are amphetamines Mask tiredness and increase aggression Associated with endurance events; eg. cycling and swimming
Narcotic analgesics	These are effectively painkillers which mask pain of an injury
Anabolic Steroids	Artificial versions of substances that occur naturally in the body; eg. testosterone Associated with building of muscle bulk. Accelerate recovery from intense training. Produce dangerous long term effects.
Diuretics	Aid in amount of water being expelled faster than normal Associated with horse racing and other weight classed sports Sometimes taken to mask presence of other substances
Erythroprotein	Newest of these substance is referred to as EPO Significant as undetectable after 72 hours Increases production of red blood cells
Blood doping	Involves removal of blood, which is re-injected at a later date. Can total a 20% increase in haemoglobin levels.

12 Testing & Measuring Fitness

TESTING	
Not intended to improve fitness but to ***monitor*** it.	
You are required to be familiar with seven such tests	
MULTISTAGE FITNESS TEST	
Testing for …	Reasonable estimate of VO_2 max
Also know as	Bleep test
VO_2 max	Maximum amount of oxygen (in millimetres) that we are able to use in one minute for every kilogram of our bodyweight
Test procedure	21 levels, each lasting a minute. Run up & down a 20 meter course Runs must coincide with the 'bleep' Number of shuttles and the running speed increase with each level (It is progressive)
Aim	Run as many levels and stages as possible
Results	VO_2 max score is obtained from the test tables
Useful for …	Games players But not for a continuous steady activity
12-MINUTE RUN	
Testing for …	Indicates endurance and approximate VO_2 max
Test procedure	100m intervals on 400m track (on any flat surface) Add up total distance (rounding down to nearest 100m)
Aim	Run as many 400m circuits plus 100m intervals in 12 mins
Results	VO_2 max score is obtained from the test tables Calibrated by age group (separate ones for ages)
Useful for …	Continuous steady paced activities Older / younger athletes as results are age specific
ILLINOIS AGILITY RUN	
Testing for …	Agility, balance and speed
Test procedure	A set course as indicated with markers Performers must complete the course as fast as possible
Results	Fastest time of two attempts Times are converted to a score
Useful for …	Test of progress (not as a method of training) Test of potential for team and racquet games players Not for stamina or endurance

SPRINT TESTS	
Testing for …	Velocity, acceleration and maximum speed Also to predict performance potential
Velocity	Speed
Acceleration	Ability to increase speed
30m Acceleration Test procedure	Monitors acceleration from a standing start Used to predict times for longer sprints
60m Sprint Test procedure	Measures sustained speed
30m Flying Sprint Test procedure	Performed and timed as a 30m section of a longer sprint
RAST Test procedure	Running-based Anaerobic Sprint Test The most sophisticated test Measures power output and fatigue levels
Useful for …	All tests are useful for games players as well as sprinters
SIT & REACH TEST	
Testing for …	Flexibility of the hip, hamstring and lower back muscles
Test procedure	Extend legs fully with soles of feet against the apparatus
Results	Distance fingertips reach past the toes is recorded Better of two attempts is recorded
Useful for …	Test of progress (not as a method of training) Participants of all activities to reduce chance of injury
PRESS-UPS / SIT-UPS	
Testing for …	Muscular endurance in arms and shoulders / abdominals
Test procedure	Press-ups – full or using knees as pivots Sit-ups – crunches, full, half twists, shoulder or head lifts (Feet held or free)
Results	Can be measured as maximum number in a set time OR Maximum number without rest
Useful for …	Test of progress and also as a method of training
Safety	Both should be modified for younger / older performers Full press-ups should not be done by those who are overweight Sit-ups should be performed with bent knees
STORK STAND TEST	
Testing for …	Balance
Test procedure	Can be done blindfolded
Results	Hands on hips, lift either leg and place toes of that leg against the knee of the supporting leg Stop time when foot is removed from the supporting knee
Useful for …	Test of progress (not as a method of training) You can improve this skill with practice but it will not necessarily improve balance in other situations

13 Fitness Training Principles

PLANNING AND MONITORING A P.E.P.

INDIVIDUAL REQUIREMENTS	
When planning take into consideration…	Why they want to exercise/train; Their age, sex and ability; Whether it is sport specific or for general health
SECIFIC FITNESS COMPONENTS	
Sport specific programme	All (both health and skill related) fitness components should be addressed Emphasis that reflects particular needs of individual Activity specific Emphasis on particular fitness components can be changed according to time of year
General exercise programme	(All fitness components to improve health; all things that you could improve at the gym) (see Components of Fitness) Not all components are necessarily accommodated in the same general exercise session
Health and skill-related components	Mixed for variety OR Isolated for specialist sessions
Quantity	At least three sessions per week This would be insufficient for the elite performer
WARM UP AND COOL DOWN	
Warm up; ROUTINE	To prepare for competition INCLUDES: Pulse raiser and flexibility (stretches) Skills / movements that are sport specific Routine should include mental preparation / focusing (Environment should be similar to that of the competition)
Cool down: ROUTINE	To gradually return body's systems to normal resting rate Inadvisable to suddenly stop activity INCLUDES: Lowering heart rate to avoid blood pooling Promotes removal of waste products and dissipation of lactic acid build-up

APPLICATION OF TRAINING PRINCIPLES

OVERLOAD	
Improvements can be made	By forcing the body to work beyond its current limits In strength, endurance and physical mobility By beginners very rapidly
Limits of overload	Workloads increased gradually and body adapts Not exceed 5-10% of existing capability
How to overload	Increase; resistance, number of repetitions and / or sets, frequency and / or intensity of sessions, reducing rest periods between sessions
SPECIFICITY	
Specificity	Training should use the same components of fitness, as you would do in the sport you are training for. This also refers to the different sports utilising different energy systems.
Specificity and energy system use	
5000m	aerobic
Games player	
Weightlifter	anaerobic
PROGRESSION	
Progression	Development and / or improvement
Intention	To move from general aims to specific targets at specified times.
	Should be agreed by both coach and performer
3 pathways of progression	✓ Easy to difficult (overload / adaptability) ✓ General to specific (specificity) ✓ Quantity to quality (peaking)
PEAKING	
Peaking	Performing at ones absolute best
	You only peak for a limited period of time. In some sports it is vitally important to peak for a specific event or competition. (eg. Olympics / World Cup)
Periodisation	Training sessions are broken down into phases or periods (dependant on when peaking is required)
REVERSABILITY	
Reversibility	Rate which fitness is lost during any periods of inactivity
How quickly decline	Rate of one-third of the time they took to gain.
Beginners	Lose fitness far more quickly than experienced performer

'FITT' PRINCIPLES

FREQUENCY	
Frequency	How often you should train
Beginner / Novice	Minimum of three sessions per week (to maintain healthy fitness levels)
Advanced / Elite	Not uncommon for elite to train 2 or 3 times a day!
INTENSITY	
Intensity	Level of the training sessions
	Governed by purpose of programme and basic fitness already achieved.
Safe Training Zone	For improvement in fitness you should train at 60-85% of max heart rate (known as safe training zone)
TIME	
Time	Refers to duration of the activity / training session
	Minimum of 30 minutes of brisk activity where the heart rate is 60% above max heart rate.
TYPE	
Type	The sort of activity used in training should reflect (or be specific to) the needs of the individual
The type should reflect	The duration – eg. 1500m = 4mins+ of 85% max HR Specificity – eg. games = 10mins @ 85% max HR 40mins @ 60% max HR 40mins @ 40% max HR

14 Training Methods

Circuit Training	
Circuit training	Based on completion of a series (or circuit) of exercises
Works?	Can be used to develop skill as well as any component of fitness.
Exercise stations	Usually 6-10 exercises / stations
	Each exercise intended to work particular group of muscles or fitness component.
Duration of station	Usually 30 seconds, 1 min or 90 seconds.
No. of Circuits	Usually complete 3-5 circuits in one session.
	Can be used as part of a weight training programme.
Maximum	Number of repetitions that can be performed in one minute. (Should be retested periodically)
Half Maximum	Half the above figure. This represents the number of reps to be performed in the circuit.
Flexibility Training	
Flexibility	Relevant to all sporting activity (often overlooked)
	Performed at least 3 times a week
	Maximising the degree of movement at a joint or joints by moving or stretching the surrounding tissue to a point marginally (but safely) beyond existing limits.
	Not just for the gymnast or injured.
	Used as part of a training programme and / or part of a warm-up routine.
	Can involve whole body movements or isolated joints (sport specific movements)
	Should not be performed violently or beyond marginal discomfort.
Active stretching	Where performer works on tasks unaided
Passive stretching	Usually performed with a partner
Assisted stretching	In order to allow stretched positions to be held safely
Continuous Training	
Continuous training	Also known as steady state training (training at the same rate / speed / intensity)
Work rate	Too high – body runs out of oxygen Too low – no training benefits
Benefits	Improved endurance (aerobic capacity) Very beneficial to older performers or those who have been inactive for some time.
Examples	Aerobics, cycling, dancing, running and swimming

Fartlek Training	
Fartlek	Swedish word for 'speed play'
What is it?	Steady-paced running interspersed with almost flat-out bursts of speed.
Improves Fitness components	The steady-paced (aerobic) running acts as recovery from the flat-out (anaerobic) bursts (Hence, aids both anaerobic and aerobic fitness)
Benefits	Distance runners an cyclists who need to change pace Games players who use frequent short bursts
Weight Training	
Weight training	Weight lifting is a sport; weight training is a method of training
How?	Traditionally with free weights; now with machines
Reps	Short for 'repetitions'; number of times a single movement is done
Set	The total number of repetitions done in one go (a set number of repetitions – eg. 10 reps = 1 set)
Progressive resistance training	Using principle of overload – gradual increase in amount of weight used / number of reps &/or sets
Benefits	All activities; muscular strength and muscular endurance (not always building muscle mass) For both general (health) fitness & specific (skill) fitness
Muscular Strength (builds muscle mass)	All work at near maximum capability Weights used = at least 85% of maximum (see circuits) Reps = 6 or less Maximums should be re-tested periodically Use of free weights should supervised Muscular strength also aids speed
Muscular Endurance (muscle tone)	Weights used = 50-60% of maximum (see circuits) Reps = 20-30 Pyramid sets should be used otherwise no benefit
Pryamid sets	Eg. 1 set of 5 reps @ 70% 1 set of 3 reps @ 85% 1 set of 1 rep @ 100% (Typically used for muscular endurance)
Negatives	Does not develop all round (ie. Aerobic) fitness
Isometric contractions: (Staionary)	Involves muscle contraction against immovable resistance (eg. – using weights well above capability or a wall) Only improves muscle strength in one static position.
Isotonic Contractions: (Moving)	Involves muscles contraction throughout a range of movement (eg. – bicep curl)

Interval Training	
Interval training	Training with short intervals (recovery periods)
Progression	Achieved by adjusting repetitions and recovery periods
Benefits	Performers whose events cover a precise distance

Interval training for an 800m runner

Personal best (PB) = 2 mins Target time = 1 min 50 sec

Phase 1:

Schedule
- 6 x 200m in 29 sec. : 3 min rest
- 6 x 200m in 29 sec. : 2 min rest
- 6 x 200m in 29 sec. : 1 min rest
- 3 x 400m in 58 sec. : 3 min rest
- 3 x 400m in 58 sec. : 2 min rest
- 3 x 400m in 58 sec. : 1 min rest

Time trial 800m = 1 min 56 sec

Phase 2 (re-set times and intervals):

Schedule
- 6 x 200m in 27 sec. : 3 min rest, etc
- 3 x 400m in 56 sec. : 2 min rest, etc

15 Training Effects

Immediate short term effects

Breathing	
Respiratory rate	Rises quickly (increase in breathing)
Effect	Air drawn into the lungs as the muscles involved in breathing work harder
Result	Increased volume of air delivers more oxygen to bloodstream and then to the working muscles
Pulse rate	
Pulse rate	Nervous system triggers a faster HR
Effect	Greater volume of blood is pumped around the body
Result	Stroke volume constant but heart beats faster Which greatly increase volume of blood to muscles
Circulation	
Circulatory rate	Increase as the level of activity rises in response to increased demand for oxygen by muscle
Effect	Major blood vessels dilate (become larger) Blood vessels not involved will constrict (narrow)
Result	Blood pressure increases More blood sent to areas that require it (working muscles)
Muscles	
Circulatory rate	Blood vessels in active muscles dilate to accommodate increased blood flow
Effect	Blood temperature increases from 37 to 41oC
Result	Produces a 15% increase in muscle performance (as temperature increases the blood supply to muscle tendons reducing likelihood of tears, strains or pulls)
Sweating	
Sweat rate	Production accelerated during levels of physical activity
Effect	Helps remove impurities from the body
Result	Contributes to body cooling

Long term effects

Effects on the Heart	
Refers to	Enlargement and strengthening of heart chambers, stronger heartbeat and more efficient circulation
Heart Rate (HR)	Lower resting HR with greater work capacity
Stroke Volume (SV)	Can be double that of an untrained individual
Cardiac Output (CO)	Larger SV increase the blood pumped from the heart
General Well-being	

Refers to	More general benefits that improve our daily lives (eg – not related to competition)
Results	Enjoy better health Better and more regular patterns of sleep Have a healthier appetite More positive attitude to life and work Less susceptible to everyday illnesses, aches and pains
Circulatory System	
Arteries	Become larger and more elastic (so better dilation)
Blood Pressure (Bp)	Is reduced (one reason - as arteries more elastic)
Red Blood Cells (RBC)	More produced so more haemoglobin (O2 attaches here!)
Fat levels	Lower levels as body has learned to utilise it as a fuel
Lactic acid (LA) tolerance	Increased capacity to process and remove LA during exercise
Breathing	
Alveoli	Increased number (air sacs in the lungs)
Lung Capacity	Therefore increased = greater volume of air to blood
Level of activity	Ability to maintain higher levels for longer
Anaerobic Capacity	Improved as there is more energy stored in the blood
Gaseous exchange	Considerably improved so wastes removed more efficiently
Breathlessness	Reduced when performing normal daily tasks
Body composition	
Bones	Become stronger as result of increased calcium production
Muscles & tendons	Become stronger and far more elastic
Fat	If activity includes aerobic exercise, body learns to utilise fat as a fuel instead of carbohydrate. Fat deposits are reduced, leading to loss of bodyweight
Muscles	
Hypertrophy	Muscles become larger
Training	Lifting heavy weights increases muscle size (hypertrophy) Lighter weights & more reps increases muscle endurance Speed training increases fast twitch muscle fibre number
Vascularisation (or collateral circulation)	An increased network of blood vessels improves the supply of blood to the muscles
Efficiency	Muscle cells store larger amounts of energy (glycogen) Tendons and ligaments become stronger and more flexible
Rate of Recovery	
Accelerated recovery rate	Allows us to cope with more regular and increased physical demands
Adaptability and progression	This accelerated recovery rate grows as new fitness levels allow even faster recovery
Oxygen dept	Faster recovery leads to faster repayment of oxygen dept and faster removal of lactic acid

16 Potential Hazards

Potential Hazards	
Risk Assessment	Looking for objects or possibilities that injury could occur and reducing the chance of it occurring
BAALPE, Safe Practice in PE, 1999	Specialised risk assessment book of procedures for PE teachers / staff
Behaviour	Can take attention away from others who may be at risk
Dress code	Can cause injury if not correct
Communication	Especially important when in teams or doing OAA
Co-operation	Is a crucial element of safe and sensible practice
Playing Fields	
Open site problems	Animal faeces, broken glass, crushed drinks cans and litter
Maintenance	Long grass, bumpy or uneven surfaces Surfaces affected by rain, snow, frost or ice
Design of surrounding area	Most difficult to close off effectively Playing field close to buildings
Equipment	Use of temporary goals or boundary posts Portable goalposts (eg. 5-a-side soccer) Rugby posts without protective padding Corner flags that are not flexible / resistant to breaking Inappropriate equipment (eg. indoor equipment) Smooth-soled footwear, particularly in contact sports
Sports hall	
Maintenance	All surfaces free from projections
Design of surrounding area	Students from other groups may be entering or leaving during activities. (eg our gymnasium!) Viewing panels in doors to check that it is safe to enter before doing so. Appropriate guidelines visible for facilities (eg weights)
Equipment	Activities involving projectiles, remember that greater velocity means added risk of injury. Ensure activities that should take place within a netted area do so. Must be safely stored away when not in use

Gymnasium	
Maintenance	Slippery, dusty or dirty floors.
Design of surrounding area	Inadequate storage space means that some portable apparatus cannot be stored easily
Equipment	Footwear used for outside activities should not be worn in the gymnasium Fixed apparatus items often project into the working floor space, even when correctly stored away
Contracting out	Outside groups during evenings and weekends can add to the above problems
Court areas (External hard courts & / or Astros)	
Open site problems	Litter, paper, drink cans and other sharp objects
Maintenance	Broken / protruding strands of fencing Nails or other sharp objects Surfaces affected by rain, snow, frost etc.
Design of surrounding area	Buildings that are too close to court areas Unprotected adjacent windows or glazed walls
Equipment	Unstable, portable posts or posts which encroach into the playing area
Swimming pool	
ASA and the RLSS	The governing bodies of activities that take place in swimming pools publish clear guidelines on risk assessment
Pool based activities	Do not enter the pool unless told and in the way you are told Engage only in the activity that you are instructed to undertake Leave the water when and in the manner you are instructed Swimmers and canoes do not mix, other than capsize drills Weaker swimmers are closest to the pool side Sensible and responsible attitude is critical
The Pool and its immediate environment	Your teacher / instructor is not 'responsible for the irresponsible' Dos and don'ts clearly displayed in appropriate areas Wet floor surfaces around the pool, showers and changing rooms General horse-lplay and any form of 'gymnastics', either in the water or on the poolside Diving boards and other poolside apparatus, particularly when other activity is taking place in the immediate area Use of flippers, snorkels or masks (other than goggles) Venturing out of your depth if you are a weak swimmer Submerged grating or grilles

Outdoor and Adventurous Activities	
OAA	Adventurous activities take place on land or on water (or possibly both).
Land based activities	Assault courses and other 'challenge' activities Camping and / or expeditions Caving and / or potholing Cycling / mountain biking Horse riding / pony trekking Mountain walking and / or climbing Orienteering Rock climbing and abseiling Skating Skiing
Risks	Location may be remote Exposure to weather and the terrain Water (& non-swimmers) Agoraphobia, vertigo or conditions such as diabetes or epilepsy could cause problems in some activities
Water based activities	Angling Canoeing and kayaking Rafting Rowing Dinghy sailing Windsurfing Sub-aqua Surfing Swimming Water skiing
Risks	Enclosed water (eg. pool or lake?) Open or coastal waters (depth and dangerous currents?) Capsize drills Activity in a remote area (access to phone, shelter etc) Activity in an exposed area (winds, safety boats etc.)

17 Prevention of Injury

MINISING RISK

Appropriate level of competition	
Age	Young people mature emotionally and intellectually at different rates Girls mature emotionally and intellectually much earlier than boys Many game shave intellectual and strategic components Age grouping competitions is the norm but appropriate competition can be unsatisfactory
Sex	Traditionally, sports and recreations are single sexed Mixed activities are now far more commonplace Many girls mature physically much earlier than boys
Size	Size can sometimes be used to advantage It is sometimes a disadvantage where mobility and speed are crucial Great differences in size are possible among students of the same age This is far more relevant in activities involving physical contact than in others Boxing is one of the few activities that classifies weight and age.
Correct clothing, footwear and items of personal adornment	
Purposes	✓ It is an expression of group or team identity ✓ Provides protection from the elements and / or during warm up ✓ Appropriate / safe for the activity for which it is intended
Clothing	Team uniform helps create an identity within the team Expression of pride in what the team represents (eg. club) Sensible, safe and affordable for normal lesson use In some instances, clothing must satisfy certain cultural / religious requirements Any additional clothing should be removed once full activity is under way Necessary additional protective clothing (eg. shin pads)

Footwear	Appropriate for the activity Unsuitable footwear can be dangerous Footwear should be laced up properly Tight-fitting footwear can cause blisters and long term foot problems Spikes or studs should be securely fastened Outdoor footwear should not be worn for indoor activities Footwear should be cleaned regularly
Items of personal adornment	Health and safety regulations apply to rings, earrings etc. and other items of personal adornment in school activities just as they do in the adult workplace Should not be worn whilst taking part in physical activity Where they cannot be removed they should be covered Long hair should be held securely in place Where physical contact could occur, fingernails should be clipped short
Correct technique	
Personal injury, injury to others,	Improves performance and reduces the risk of injury Poorly executed technique can result in serious injury Eg. A poorly directed discus can result in serious injury to anyone who might be in its way
Knowledge of appropriate safety procedures, risk assessment	
Safety procedures include…	Risk assessment, Identification of potential hazards Prevention of injury
Are important in…	Setting up / preparing for an activity Ensuring safe working practices Completion and clearing away
Lifting / carrying/ placing equipment	
	Equipment is often dangerous when it is being moved Key points: cooperation and safety Lifting and carrying items of gym equipment and fixing and securing heavy items such as movable wall bars and beams Items such as javelins, discoi and shot pose other problems
You should know how to…	✓ Take out and move equipment safely ✓ Make secure and use equipment safely ✓ Put away equipment safely

Personal Protective Equipment	
Recommended	To use protective equipment
Three issues:	The need to take reasonable measures to ensure sensible personal protection Consideration for the feelings of an opponent who may injure you simply because you fail to act responsibly by wearing protective equipment. Whether, in some instances, the wearing of protective equipment encourages a less responsible attitude to the way you perform.
Rules, codes, laws	
Primary aims of rules of any sport include	○ The establishment of a framework of rules which as far as possible ensures fair competition ○ Setting clear guidelines as to what is safe and fair practice ○ Identifying a range of sanctions to be used against offenders
Warm up / cool down	
Why?	Important as a preparation for good performance but is also a crucial element in the avoidance of injury, particularly in the first few moments of activity. Gradual and controlled cool down helps in achieving the most effective recovery from physical exertion Massage and other manipulatory procedures are often employed to assist in both preparation for and recovery after activity
Good Personal Hygiene	
✓ Shower, using soap, after all physical activity ✓ Dry off thoroughly before dressing ✓ Never wear the same clothes during and after physical activity ✓ Ensure that all personal items of clothing are washed after each use	
Most common infections	
Athletes foot	A form of fungi that infects the area between the toes and soles of the feet
Verrucae	A form of wart which become embedded into the feet because of the pressure caused by walking
In both cases	Infection can be greatly minimised by properly drying the feet after showering or bathing

18 Injury Treatment

Treatment of simple performance injuries

Signs and symptoms	
Signs	Are those things you can see
Symptoms	Are thise things the injured person can tell you about
Blisters	
Why	Form when the skin repeatedly rubs against another surface
What	A tear occurs between the layers of the skin and fluid seeps into the space
Where	The most common site for blisters is on the feet, but the hands can also be affected
Skin unbroken	Protective padding is the best immediate treatment
Larger blisters	They may need to be drained under medical supervision
Skin is broken	The blister should be disinfected, covered and medical advice sought
Concussion	
	All knocks to the head should be treated as potentially dangerous Concussion is the result of a severe blow to the head causing jarring of the brain against the skull
Signs	The subject ay be unconscious, although this is often short-lived They may appear to be drowsy or drunk, and may be confused They may have some difficulty in staying awake and speech may be slurred
Treatment	All cases of suspected head injury must receive immediate medical attention This should be done via a member of staff or other person in charge of your group Try to help the subject retain consciousness, but refuse requests for drinks No other treatment should be administered other than to keep the injured person warm and comfortable

Cuts and grazes	
Minor cuts	Cleanse and apply an antiseptic dressing
Deep cuts	Risk of muscle, tendon or major blood vessel may be severed. Affected part should be immobilised and medical treatment sought immediately Primary aim – to stem any blood flow until help arrives If pressure applied does not relieve bleeding, a tourniquet (bandage) should be tied at the nearest pressure point above the injury.
Dehydration	
Result	From a combination of excessive perspiration (fluid loss) and an inadequate fluid intake.
Signs	Excessive sweating Rapid heart rate Vomiting Sunken eyes
Symptoms	Sickness Dizziness Feeling of extreme weakness Difficulty in maintaining balance and coordination
Treatment	Sensible and immediate fluid intake (rehydration) Seek specialist medical diagnosis Loss of more than 15% of body fluid can cause a seizure, brain damage or in some cases death
Exhaustion	
Result	Associated with extreme environments or events involving considerable endurance The body has used up its available energy stores and fluids
Signs	Extreme difficulty in co-ordinating movement Low temperature Dilated pupils Weak pulse Pale, moist skin Fainting spells
Symptoms	Headaches Sickness and / or dizziness Extreme physical weakness
Treatment	In cases involving heat or cold, warm or cool subject Medical advice should be sought immediately Electrolyte drinks or slightly salted water can be sipped No alcohol or caffeine as this interferes with the body's temperature regulation.

Injury to Ligaments, Tendons and Muscles	
Strain	Injury to muscle or tendon caused by overuse, excessive force or over-stretching
Sprain	Injury to ligament caused by wrench or twist Common at knee, ankle or wrist. Most effective treatment is based on RICE (see below)
Tear	A complete or partial rupture of muscle, ligament or tendon fibres Most effective treatment is immediate immobilisation followed by RICE (see below)
Winding	
Result	A blow to the abdominal area, paralysing the diaphragm
Signs	Difficulty in breathing, doubling over at eh waist, inability to speak.
Treatment	Placed in a reclining, seated position until the ability to breathe is recovered.

TREATMENT OF MINOR INJURIES

R.I.C.E.	
Recommended as early treatment for all minor injuries and can help promote recovery almost from the onset of injury.	
Reduce blood flow	Reduces chance of swelling in tissues Reduces chance of bleeding in tissues (bruising) Reduces blood loss from major cuts
REST	
Rest	Reduces / stops bleeding Minor strains or muscle injury, rest should last 24 hours Strapping is only as a support and should only do so if need to stabilise joint is a necessity
ICE	
Ice	Constricts blood vessels and restricts bleeding in area Aids in reduction of swelling Do not apply ice directly to skin as it may cause skin burns
COMPRESSION	
Compression	Achieved by firmly binding affected area Not so tight it restricts circulation entirely If tourniquet used, not at site of injury but at pressure point above site.
ELEVATION	
Elevation	Elevate injured part so that gravity assists in the drainage of the tissue fluids Also reduces blood flow to site of injury