

Reasons for taking part in Sport

Key Words		What I must know
Mental	Physical	<p>The 3 reasons why people take part and be able to give at least 3 examples of each. These MUST be specific and not just vague answers like “get fitter”. Be able to apply to different situations and look for a reason within the text.</p> <p>The benefits of things like competition, team-work etc and be specific about what someone might enjoy. The definitions must be clearly remembered.</p>
Social	Health	
Fitness	Performance	
Stress	Enjoyment	
Illness	Friendship	
Teamwork	leadership	
Challenge	Aesthetic Appreciation	

Physical Benefits

- helps the individual to feel good and look good
- enhances body shape and improves muscle tone
- Improves cardiovascular fitness, weight loss, muscular strength
- contributes to good health preventing illness and heart/lung disease

Mental Benefits

- relieve stress/tension and stress related illness
- Improve self esteem and confidence
- Stimulate enjoyment and escapism
- Stimulates challenge and competition
- Aesthetic appreciation, enjoying the art of the performance

Social Benefits

- Encourage teamwork and co-operation
- Meeting new people encouraging friendship and social mixing

Definitions I must know and be able to explain with examples.

Health: A complete state of physical , mental and social well being, not just the absence of disease

Fitness: The ability to adapt to the demands of the task or environment

Performance: How well an activity is completed compared to others or previous performance

Exercise: Physical activity used to improve one's health

Training: Physical activity used to improve one's fitness

Aesthetic Appreciation: Enjoying the artistic beauty of a performance

Types of Fitness

Key Words	What I must know
<p>Health Related</p> <p>Cardiovascular Muscular Strength</p> <p>Muscular Endurance Flexibility</p> <p>Body Composition</p> <p>Skill Related</p> <p>Agility Balance</p> <p>Co-ordination Power</p> <p>Speed Reaction Time</p>	<p>The definition of all 11 components of fitness and be able to give specific sporting examples of how they are used in sports performance. The example but be a situation such as pushing in a rugby scrum to show strength.</p> <p>For each component you must be able to explain what principles of training and what types of training that you would use to improve them.</p>

Component	Definition	Example
Cardio vascular Endurance	The ability of the heart and blood vessels to supply the body with oxygen and sustain exercise over long periods of time	Being able to maintain a high work rate throughout the 90 minutes of a football match
Strength	Maximal force produced in one single contraction	Lifting your body up during a rock climbing move
Muscular Endurance	Ability of muscles to sustain repeated contractions	Maintaining the same effort during a rowing race
Flexibility	Range of motion possible at a joint	Range of motion of arms in the butterfly swimming stroke
Body Composition	Ratio of fat to muscle, bone and lean body mass	Reducing weight to make a fight category in boxing
Agility	Ability to change direction quickly	Sidestepping in netball
Balance	Ability to maintain stability during stationary positions or dynamic movement	Staying upright during ski slalom
Co-ordination	Ability to perform 2 or more tasks at once	Looking around the pitch whilst dribbling with a hockey stick
Power	Ability to produce a maximal force as quickly as possible	Taking off during a basketball lay up
Reaction Time	Ability to respond to a stimulus	Reacting to a smash in badminton
Speed	Ability to move the body or body parts quickly	Bowling a fastball in baseball

Principles of Training/ Types of Training

Key Words		What I must know
Specificity	Progression	Be able to give a specific example of how a training programme or session uses the principles. Explain how training programmes are adapted to different athletes and why. Be able to fully explain the FITT principle with examples from a given exercise programme. Explain all types of training with examples and be able to select a training method for a given athlete or sport and explain why.
Overload	FITT Principle	
Reversibility	Determination	
Individual Needs	Moderation	
Frequency	Intensity	
Time	Type	
Fartlek	Interval	
Continuous	Aerobic	
Resistance	Circuit	

Specificity–	Making the training specific to the sport with the same actions, muscle groups or energy systems.
Progression–	Making the training harder over time to allow adaptation
Overload–	Making the training harder than normal daily tasks. It is easy to confuse with progression.
Overload consists of	Frequency– How often Intensity– How hard Time– How long you work for Type– Choice of activity
Reversibility–	Keep up the training or you lose the fitness
Moderation–	Not doing too much too soon
Individual Needs–	Making the training specific to your fitness level
Determination–	How hard you are prepared to work

Types of Training

Circuit Training– Consists of stations of exercises, periods of work and rest and can be adapted to include all aspects of both health and skill related fitness

Fartlek training– Speed Play, randomly changing the speed and terrain over longer periods. Replicates cross country running or team games

Resistance– Using bodyweight, weights or cords to provide resistance for muscles to overcome

Aerobics—Exercise done to music, normally within groups and low impact to produce cardiovascular fitness

Continuous– Keeping heart rate within the target heart rate zone for long periods of time

Interval– Structured periods of work and rest or easier periods.

Cross Training– Using other methods to maintain fitness such as swimming

Sports Injuries

Key Words	What I must know
Fracture	Types of soft tissue injuries Types of hard tissue injuries and different types of fracture How to treat using RICE and DRABC The types of dangerous conditions How to prevent injuries and reduce risks Chronic and acute injuries
Simple	
Sprain	
RICE	
Hypothermia	
Cramp	
Balanced Competition	
Risk Assessment	
Tendons	
Dislocation	
Compound	
Strain	
DRABC	
Dehydration	
Heat Stroke	
Training	
Symptoms	
Ligaments	

Hard Tissue Injuries	Soft Tissue Injuries
Dislocation, Fractures, Cartilage damage	Cuts and grazes, blisters, Muscular Strain or Tear, Joint
Symptoms of deformity, swelling, pain, sever bruising	Symptoms of pain, swelling, redness, jerky movement
Treatment by emergency services, elevation and support. Urgent medical attention	Treatment with Rest Ice Compression Elevation

Dangerous Conditions

Hypothermia: Brought on by being too cold and wet

Heat Stroke: Hot weather and Sun, body temperature too high

Cramp: Dehydration and lack of salts causing seized muscles

Concussion: Severe blows to the head such as in contact sports

Dehydration: Lack of fluids in the body, dry skin and mouth

TREATMENT WITH DRABC– Put in Recovery Position

Prevention of Injury

Warming up and Cooling Down: To prevent muscle injuries and practice skills of the game

Rules of the game: Keeping within the rules such as tackling in rugby

Equipment: Using the correct protective equipment for the game such as shin pads and gum shields but also ensuring the equipment is in good working order such as bicycles and harnesses.

Correct Clothing: The right clothing for the conditions and the sport such as winter sports, water sports. Wearing boots for rugby and football.

Balanced Competition: Matching based on ABILITY or GRADE, GENDER, AGE, WEIGHT

The Effects of Poor Hygiene:

Verrucae- transmitted by contact, treatment by covering and creams

Athlete Foot- Caused by poor drying and sweat. Treatment with creams

Sports Nutrition

Key Words		What I must know
Aerobic	Anaerobic	Function of all of the food groups and their relation to training and exercise
Protein	Fat	
Carbohydrate	Vitamins	Define the terms Overweight, Obese and Overfat.
Minerals	Fibre	
Water	Calories	Explain with examples and justify the somatotypes
Somatotypes	Ectomorph	
Endomorph	Mesomorph	The effects of smoking and alcohol
Analgesics	Beta blockers	
Depressants	Stimulants	The effects and dangers of drug use
Anabolic	Steroids	
Diuretics	Blood Doping	

	Functions	Where Found
Protein	Growth and Repair	Meat, fish, cheese, eggs
Fat	Insulation and second energy source	Nuts, red meat, butter, oils
Carbohydrate	Primary energy source	Cereals, pasta, bread, rice, vegetables
Vitamins	Body functions, reactions and skin etc	Fruit and vegetables
Minerals	Bone strength, blood, body reactions	Milk, vegetables, meat
Fibre	Improve digestion	Vegetables, wholemeal foods
Water	Hydrate and cool the body	Fruit, vegetables, juices

Somatotypes

Mesomorph– M for Muscular– Lean body mass, sprinters, boxers and gymnasts
 ECTOmorph– T for thin– High jumpers, triple jumpers,
 ENDOmorph– D for Dumpy– Rugby forwards, sumo wrestlers
 Athletes may not be ideal weight but their body shape is an advantage to their sport and can therefore be overweight.

Overweight- Being heavier than the recommended weight, common in sportspeople
 Over fat– Too much body fat compared to lean body mass
 Obese- More than 20% overweight **MOST DANGEROUS!!**

Drugs in Sport

Alcohol and Smoking– **SOCIALLY ACCEPTABLE** Damages organs, reduces oxygen intake, causes dehydration
 Anabolic Steroids– Stimulate muscle growth, develops male characteristics, testosterone
 Stimulants– Increase energy and alertness, masks some pain, prevents fatigue– fighting
 Blood Doping– Taking blood out and putting back in to the body after altitude training– cycling
 Narcotic Analgesics– Painkillers, mask pain and hide injury– Rugby Boxing
 Beta Blockers– Slow down heart rate, improve concentration– Shooters
 Diuretics– Increase water loss to reduce weight—boxers and jockeys

Long Term Effects of Exercise

Key Words	What I must know
<p>Hypertrophy Cartilage Capillarisation Density Alveoli Vital Capacity V02 Max Cardiac Output Heart Rate Stroke Volume Synovial Glycogen Fatigue Oxygen</p>	<p>Be able to explain in detail how a long term effect can be beneficial to performance. Specific examples of each body system.</p> <p>At least 1 good example from each body system and what sort of training would bring about the change and adaptation.</p> <p>Be able to explain the difference in each system between a non athlete and an elite athlete.</p>

Skeletal System

Increase in bone density, especially around joints, movement stimulated growth
 Increase in thickness of cartilage around joints
 Increase in synovial fluid around joints

Muscular System

Increase in muscle size and density– Hypertrophy
 Increase in strength
 More capillaries in the muscles
 Greater resistance to fatigue

Cardiovascular System

Lower resting pulse rate
 Increased stroke volume therefore greater cardiac output
 Lower blood pressure
 More capillaries
 More red blood cells
 Stronger arteries and veins with wider lumen

Respiratory System

Increase in alveoli and capillaries in lungs
 Stronger intercostals muscles
 Increased vital capacity
 Slower breathing rate
 More oxygen extracted– Greater VO2 max

Short Term Effects of Exercise

Key Words		What I must know
Mental	Physical	<p>The short term or immediate effects of exercise in chronological order with an explanation of why they happen.</p> <p>Knowledge of all 4 systems and the effects of different forms or intensities of exercise.</p> <p>Be able to explain how athletes are different due to the long term adaptations in helping them to perform for longer and offset the effects</p>
Social	Health	
Fitness	Performance	
Stress	Enjoyment	
Illness	Friendship	
Teamwork	leadership	
Challenge	Aesthetic Appreciation	

<p>Skeletal system</p> <p>Joins become more mobile due to more elastic ligaments</p> <p>Warmer synovial fluid</p> <p>Greater range of motion</p>	<p>Muscular</p> <p>Produce carbon dioxide through respiration</p> <p>Increase temperature</p> <p>Use more oxygen</p> <p>Produce lactic acid</p> <p>Become painful and fatigued</p>
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<p>Cardiovascular system</p> <p>Blood becomes more acidic</p> <p>Higher blood pressure</p> <p>Faster pulse and HR</p> <p>Greater stroke volume and cardiac output</p> <p>Vasodilatation</p> <p>Redirection to working muscles</p> <p>Understand Heart Rate Graphs with reference to fitness levels, recovery rate and training target zones</p>	<p>Respiratory System</p> <p>Increase in tidal volume</p> <p>Increase in breathing rate</p> <p>Breathe out more CO₂</p> <p>Extra breathing muscles used</p> <p>Use more oxygen</p> <p>Oxygen 21% in 16% out</p> <p>CO₂ 0.04% in 4% out</p>
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Limiting factors in exercise

The muscles can only exert a force for as long as oxygen and glucose can be supplied and waste products of carbon dioxide and lactic acid removed. If this is not balanced then the muscles will eventually stop. If the muscles overheat, and the body cannot get rid of heat quickly enough, the body will overheat and collapse. The CV and Respiratory systems are responsible for supplying and removing products to and from muscles. The more efficient they are at doing this, the longer the muscles will be able to keep going.

Skeletal System

Key Words		What I must know
Axial	Appendicular	The structure and function of the skeleton. How bones grow, how they are formed and the role of calcium. Explain with examples how the functions are relevant to sport. Understand levers, movement and the structure of the 3 types of joints. Fully label a long bone and a synovial joint. Know the range of motion possible at each type of synovial joint and where they are found. Name of the major bones and the types of movement.
Articular	Cartilage	
Movement	Protection	
Support	Blood Production	
Ossification	Calcium	
calcium	marrow	
periosteum	diaphysis	
short	flat	
irregular	hyaline	
Synovial	Fixed	

Structure

- Cartilage hardened by calcium known as ossification
- 4 types, long, short, flat and irregular
- Protective part with flat bones and movement with long bones
- Bones meet at joints, fixed, slightly moveable and synovial
- Vertebrae is in 5 sections of Coccyx, sacrum, lumbar, thoracic, cervical

Functions

- Allow movement through long levers and joints
- Protect vital organs from impact such as the heart and brain
- Produce RED blood cells in the bone marrow
- Provide support to keep the body upright
- Mineral and calcium storage
- Provide body shape for the internal organs

Bone Names

Cranium, atlas, axis, vertebrae, scapula, clavicle, sternum, ribs, humerus, ulna, radius, carpals, metacarpals, phalanges, pelvis, femur, tibia, fibula, tarsals, meta tarsals, patella.

Joint Types and Movements:

Ball and Socket– Shoulder and Hip– Adduction, Abduction, Rotation, Flex Extend
 Hinge– Knee and Elbow– Flexion and Extension
 Gliding– Flex and Extend, Adduct and Abduct
 Saddle- Flex and Extend, Adduct and Abduct
 Pivot- Shoulder and Hip– Adduction, Abduction, Rotation, Flex Extend

Tendons are structures that join Bone to Muscles. Ligaments surround joints giving them stability and join bone to bone.

Muscular System

Key Words		What I must know
Cardiac	Skeletal	The structure and function of the 3 types of muscular tissue. The main functions of the muscular system. The names of the major muscles and their actions. Be able to explain movements in terms of muscle action.
Smooth	Voluntary	
Involuntary	Striped	
Fatigue	Agonist	
Antagonist	Hypertrophy	Aerobic and Anaerobic exercise, the types of muscle fibre, the types of contraction and the antagonistic relationship, or how muscles move.
Fast Twitch	Slow Twitch	
Aerobic	Anaerobic	
Glycogen	Lactic Acid	
Respiration	Contract	Explain the terms of respiration, muscle tone, and the role muscles play in exercise.
Isometric	Isotonic	
Muscle Tone	Venous Return	

Cardiac Muscle- Found in the heart, never tires but totally involuntary

Smooth Muscle -Found in the internal organs, Involuntary

Skeletal Muscle– Under conscious control, voluntary, easily tires.

Functions

- Movement– By attachment and pulling on bones to act as levers
- Heat– Produced as a waste product of respiration
- Glycogen Storage– Stored as the primary energy source for exercise
- Protection– Protects bones and organs from impact
- Posture– Keeping the body upright through good muscle tone

Fast Twitch fibres– Explosive, Easily tire, Sprinting muscles, Anaerobic

Slow Twitch fibres– More endurance, resist fatigue, Aerobic

Major Muscles—Be able to explain their actions with sporting examples:

Trapezius, deltoid, bicep, tricep, pectorals, abdominals, Latissimus, Quadriceps, hamstrings, Gastrocnemius.

Explain the following with examples:

How muscles work in antagonistic pairs, muscle tone and posture, isometric and isotonic movements.

Also be able to explain both the long term and short term effects on the muscular system with examples of how it can benefit an athlete.

Cardiovascular System

Key Words	What I must know
Cardiac Heart Rate Cardiac Output Veins Capillaries Platelets Ventricle Vena cava Valves Septum	Stroke volume Pulse Blood Pressure Arteries Plasma Red and White cells Atrium Aorta Lumen Pulmonary
Fully label a heart Diagram. Explain the term Double circulation. Be able to plot the route of a red blood cell with the function of all the structures it passes. Be able to identify the valves. Explain the composition and function of blood and the difference between the blood vessels The effects of exercise both long and short term. The role of valves and muscles	

Path of a Red Blood Cell	Blood Vessels	Blood Components
Right Atrium Tricuspid Valve Right Ventricle Semilunar Valve Pulmonary Artery Lungs Pulmonary Vein Left Atrium Bicuspid Valve Left Ventricle Septum Aorta Arteries Capillaries Muscles Veins Vena cava	Arteries: Narrow Lumen Muscular Wall High Blood Pressure Usually Oxygenated Always away from Heart Veins Low Pressure Wide Lumen Have Valves Usually Deoxygenated Always TO heart Capillaries One Cell thick Easy to diffuse across Only 1 cell wide	Red Blood Cells No nucleus Carry Oxygen White Cells Fight disease Create antibodies Platelets Clot the blood Form protective barriers Plasma Carries heat, water, nutrients Carries dissolved CO ₂

Definitions I must know

Cardiac Output:	The amount of blood pumped out per minute
Septum: separates	Oxygenated and De-oxygenated blood
Stroke volume:	Amount of blood per beat
Heart Rate:	number of beats per minute
Double Pump:	Pumps to the lungs and the body at the same time with 2 types of blood
Blood Pressure:	Lots of blood going through a narrow space. Low on return
Venous Return:	Muscles squeezing veins and valves stopping back flow

Respiratory System

Key Words	What I must know
Larynx Trachea Alveoli Bronchioles Tidal Volume Vital capacity Oxygen Debt V02 Max Breathing Rate Gas exchange Inhale Exhale Diaphragm Intercostal	identify the positions of the larynx, trachea, bronchi, bronchioles and alveoli and explain the effects of exercise and training upon them. Describe the path of an air molecule with all the structures it passes. Describe the mechanics of breathing and the various lung volumes. Explain respiration as an equation and the process of gas exchange
<p>Path of an Air Molecule:</p> Nasal Cavity– Cleans and Warms Larynx– Cleans and moistens Trachea– Cartilage keeps shape Bronchus– Splits to lungs Bronchioles– Takes to Alveoli Alveoli– 1 cell thick for Gas exchange Capillary– Air forces through to blood Blood– Haemoglobin carries oxygen Working Muscle– Respires using O2	<p>Breathing in– Inspiration/Inhale</p> Diaphragm flattens Intercostals pull ribs up and outwards Lower pressure sucks air in Air has 21% Oxygen and 0.04% CO2
	<p>Breathing Out– Exhale/Expiration</p> Diaphragm lifts and arches Intercostals pull ribs down Pressure increases forces air out Air has 16% oxygen 4% CO2 An example of Antagonistic Pairs.

Definitions I must know and be able to explain with examples.

- Tidal Volume–** The amount of air breathed in and out during normal breathing
- Gas Exchange–** The exchange of carbon dioxide and oxygen taking place in the lungs
- Vital Capacity–** The amount of air breathed out in one single breath
- Minute Ventilation–** The amount of air breathed out during one minute
- Respiratory Rate–** The number of breaths per minute
- Oxygen Debt–** The need for a high heart rate and breathing rate to clear the CO2 and lactic acid after intense exercise. Helps the body to recover
- V02 Max–** The amount of oxygen that can be extracted from the air by the body per minute.

The Training Session

Key Words	What I must know
Warm up Cool down Pulse raiser stretch Personal Exercise Programme Max HR Target Zone Aerobic Anaerobic Heart Rate Curve Training Methods Principles of Training Resting Pulse Recovery Rate	How to plan a training session based on the specific needs of an individual. How to work out and adjust target heart rate zones with knowledge of how to find resting pulse and recovery rate. Understand how to read a heart rate graph and look for patterns of work and rest or fatigue.

Planning a Training Session: To include WARM UP, MAIN ACTIVITY, COOL DOWN

3 Part Warm up: Pulse Raiser, Mobility and Stretch.

Select the right training method such as continuous, fartlek or interval depending on the needs of the athlete and the relevance to their sport

Set a target heart rate based on fitness or training for performance. Find their max heart rate with $200 - \text{age}$ and work between 60% and 80%

Different training methods will produce different heart rate graphs. You will need to be able to recognise these and interpret them to look for when the athlete started, stopped or increased their work rate.

Be able to recognise fitness over time with regard to a lower resting heart rate, a lower working heart rate or a greater distance achieved during a set time. What makes one athlete fitter than another.

Use the principles of training, along with explanations of how to monitor fitness over time.

<p>Interval Training Heart Rate</p> 	<p>Fartlek training Heart Rate</p> 
<p>Athlete with Good Recovery</p> 	<p>Athlete with Poor Recovery</p> 