**Paper 1: Physical factors affecting performance checklist**

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| **Specification point** | **Topic area** | **You must know / be able to** | **R** | **A** | **G** |
| **1.1.a. The structure and function of the skeletal system** | * Location of major bones | * State the name and location of the following bones (cranium, vertebrae, ribs, sternum, clavicle, scapula, pelvis, humerus, ulna, radius, carpals, metacarpals, phalanges, femur, patella, tibia, fibula, tarsals, metatarsals.) |  |  |  |
|  | * Functions of the skeleton | * Describe the functions of the skeleton and provide examples of how it is used in sports (support, posture, protection, movement, blood cell production, storage of minerals.) |  |  |  |
|  | * Types of synovial joints | * Define what a synovial joint is * State the bones which articulate to make the two hinge joints (knee and elbow) * State the bones which articulate to make the two ball and socket joints (hip and shoulder) |  |  |  |
|  | * Types of movements performed at synovial joints | * Describe the types of movements at a hinge joint (flexion and extension) and be able to use a sporting example of this movement * Describe the types of movements at a ball and socket joint (flexion, extension, rotation, abduction, adduction, circumduction.) and be able to use a sporting example of this movement |  |  |  |
|  | * Other components of joints | * Describe the roles of ligaments, cartilage, synovial fluid and tendons |  |  |  |

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| **1.1.b. The structure and function of the muscular system** | * Location of major muscle groups | * State the name and location of the following muscle groups (deltoid, trapezius, latissimus dorsi, pectorals, biceps, triceps, abdominals, quadriceps, hamstrings, gluteal, gastrocnemius.) and be able to use them in a sporting example |  |  |  |
|  | * The roles of muscles in movement | * The definition of antagonistic muscle pairs * Use an example of muscles working in pairs to complete a skill * The definition and role of the following (agonist, antagonist and fixator) |  |  |  |

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| **1.1.c. Movement analysis** | * Lever systems | * Describe the 3 different types of levers and how they are used in sport (1st class: neck, 2nd class: ankle and 3rd class: elbow) * Define mechanical advantage |  |  |  |
|  | * Planes of movement | * Identify the location of planes of movement (frontal, transverse and sagittal) * Describe the types of movements that can occur at each plane (Frontal: Abduction and adduction), transverse (Abduction, adduction, rotation) and sagittal: flexion and extension) * Provide sporting examples using the planes of movement. |  |  |  |
|  | * Axis of rotation | * Identify location of axes of rotation (frontal, transverse and longitudinal) * Describe the types of movements that can occur at each axis (Frontal: Sideways rotation), (Transverse: Forwards and backwards rotation) and (Longitudinal: vertical rotation/spinning) * Provide sporting examples using the planes of movement. |  |  |  |

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| **1.1.d. The cardiovascular and respiratory systems** | * Structure of the cardiovascular system | * Identify the location of the different structures of the heart (atria: right and left atrium, ventricles: left and right, bicuspid, tricuspid and semilunar valves, septum: separates left and right side of heart, aorta pulmonary artery, vena cava, pulmonary vein) * Describe the pathway oxygenated and deoxygenated blood takes through the heart * Describe the structures of the different blood vessels: arteries, veins and capillaries * Define heart rate (HR/BPM), Stroke volume (SV), and cardiac output (Q) |  |  |  |
|  | * Function of the cardiovascular system | * Explain blood passes through the heart twice as it is a double circulatory system (systemic: heart/body) and (pulmonary: lungs/heart) * Describe functions of the 3 blood vessels * Explain the role of blood (red blood cells, white blood cells) |  |  |  |
|  | * Structure of the respiratory system | * Describe the pathway air takes through the respiratory system (mouth, nose, trachea, bronchi, bronchiole, alveoli) |  |  |  |
|  | * Function of the respiratory system | * Explain the role of respiratory muscles when breathing diaphragm, intercostals and the effect they have on the rib cage and partial pressures inside the lungs * Define breathing rate, tidal volume and minute ventilation |  |  |  |
|  | * Aerobic and anaerobic exercise | * Define aerobic and anaerobic exercise * Provide practical examples of aerobic and anaerobic activities in relation to intensity and duration. |  |  |  |

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| **1.1.e. Effects of exercise on body systems** | * Short term effects of exercise | * Explain the short-term effects of exercise on muscle temperature, heart rate, stroke volume, cardiac output, redistribution of blood flow during exercise, respiratory rate, tidal volume, minute ventilation, oxygen to the working muscles, lactic acid production * Provide sporting examples that can link to the short-term effects. * Use data relating to short-term effects of exercise. |  |  |  |
|  | * Long term effects of exercise | * The long-term effects of exercise on: bone density, hypertrophy of muscle, muscular strength, muscular endurance, resistance to fatigue, hypertrophy of the heart, resting heart rate and resting stroke volume, cardiac output, rate of recovery, aerobic capacity, respiratory muscles, tidal volume and minute volume during exercise, capillarisation. * Sporting examples that can link to the long-term effects. * Use data relating to long-term effects of exercise. |  |  |  |

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| **1.2a components of fitness** | * Components of fitness | * The definition of cardiovascular endurance/stamina, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: Cooper 12 minute run/walk test – multi-stage fitness test (bleep test) * The definition of muscular, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: press-up test and sit-up test * The definition of speed, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: 30m sprint test * The definition of strength, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: grip strength dynamometer test and 1 Repetition Maximum (RM) * The definition of power, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: ‘standing jump’ or ‘vertical jump’ tests * The definition of agility, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: Illinois agility test * The definition of balance, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: stork stand test * The definition of coordination, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: wall throw test * The definition of reaction time, practical examples where this component is particularly important in physical activity and sport and suitable tests for this component: ruler drop test * How to collect and use data relating to the components of fitness (describe how to complete the test and use normative data to compare results) |  |  |  |

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| **1.2b applying the principles of training** | * Principles of training | | * The definitions of the principles of training and be able to apply them to personal exercise/training programmes: specificity, overload, progression, and reversibility |  |  |  |
|  | * Optimising training | | * The definition of the elements of FITT (Frequency, Intensity, Time, Type) and be able to apply these elements to personal exercise/training programmes * The definitions and descriptions of the different types of training: continuous, fartlek and interval (circuit training, weight training, plyometrics, HIIT: High Intensity Interval Training). * The key components of a warmup and be able to use practical examples: pulse raising, mobility, stretching, dynamic movements, skill rehearsal * The physical benefits of a warmup: increasing body temperature thus warming up muscles in preparation for exercise, heart rate, flexibility of muscles and joints, pliability of ligaments and tendons, blood flow and oxygen to muscles, the speed of muscle contraction * the key components of a cool down and be able to apply examples: low intensity exercise, static stretching * the physical benefits of a cool down: helping the body transition back to a resting state, gradually lowers heart rate, gradually lowers temperature, circulates blood and oxygen, gradually reduces breathing rate, increases removal of waste products such as lactic acid, reduces the risk of muscle soreness and stiffness, aids recovery by stretching muscles. |  |  |  |
| **1.2c Preventing injury in physical activity and training** | * Prevention of injury | | * how the risk of injury in physical activity and sport can be minimised and be able to apply examples: personal protective equipment, correct clothing/footwear, appropriate level of competition, lifting and carrying equipment safely, warm up and cool downs * potential hazards in a range of physical activity and sport settings and be able to apply examples: sports hall (wet/slippery floor), fitness centre (equipment left out), playing field (potholes), artificial outdoor areas (dog mess), swimming pool (wet floor). |  |  |  |