Ravens Wood School PE A-Level

Year 1

Factors affecting participation in physical activity and sport

Topic	R	A	G
Applied anatomy and physiology			
Cardio-respiratory system			
Cardiovascular System			
Understanding of the impact of physical activity and sport on the health and fitness of the individual. • Health – heart disease, high blood pressure, effects of cholesterol, stroke) • Fitness – cardiac output in trained and untrained, maximal and sub-maximal exercise.			
The hormonal, neural and chemical regulation of responses during physical activity and sport • Anticipatory rise • Redistribution of blood (vascular shunting, vasoconstriction, vasodilation) • Cardiac conduction system • Sympathetic and parasympathetic • Carbon dioxide			
Receptors involved in regulation of responses during physical activity. • Chemoreceptor • Proprioceptor • Baroreceptor			
Transportation of oxygen • Haemoglobin • Myoglobin • Oxyhaemoglobin disassociation curve • Bohr shift			
Venous return • Mechanisms • Relationship with blood pressure (systolic, diastolic)			
Starlings law of the heart			
Cardiovascular drift			
Arterio-venous oxygen difference (A-VO_2 diff) • Variations in response to an exercise session • Variations between trained and untrained individuals • Adaptions to body systems resulting in training effect.			
Respiratory System			
Understanding of lung volumes and the impact of and on physical activity in sport • Residual volume • Expiratory reserve volume • Inspiratory reserve volume • Tidal volume • Minute ventilation			

Gas exchange systems at alveoli and muscles • Oxygen and carbon dioxide • Principles of diffusion and partial pressures			
The hormonal, neural and chemical regulation of pulmonary ventilation during physical activity • Adrenaline • Sympathetic and parasympathetic • Carbon dioxide			
Receptors involved in regulation of pulmonary ventilation during physical activity • Chemoreceptor • Proprioceptor • Baroreceptor			
Impact of poor lifestyle choices on the respiratory system • Smoking • Oxygen transport			
Neuromuscular System			
Characteristics and functions of different muscle fibre types for a variety of sporting activities. • Slow twitch (type I) • Fast glycolytic (type IIx) • Fast oxidative glycolytic (type IIa)			
Nervous system • Sympathetic and parasympathetic			
Role of proprioceptors in PNF • Muscle spindles • Golgi tendons organ			
The recruitment of muscle fibres • Motor units • Spatial summation • Wave summation • All or none law • Tetanic			
The Muscular-Skeletal system and analysis of movement in physical activities			
Joint action in the sagittal plane/transverse axis. • Shoulder and hip (flexion, extension and hyper extension) • Elbow and knee (flexion and extension) • Ankle (plantar flexion and dorsi flexion			
Joint actions in the frontal plane/ sagittal axis • Shoulder and hip (abduction and adduction)			
Joint actions in the transverse plane/longitudinal axis. • Shoulder and hip (horizontal abduction and adduction)			
Types of joint, articulating bones, main agonists and antagonists, types of muscle contraction. • Isotonic (concentric and eccentric) • Isometric			
Energy Systems			
Energy Transfer in the body • Aerobic energy system (glycolosis, kerb/citric acid cycle, beta oxidation, electron transport chain).			

• Anaerobic energy systems (ATP-PC system, anaerobic glycolytic system).			
Energy continuum of physical activity • Consideration for physical activity and sport of different intensities and durations. • Differences in ATP generation between fast and slow twitch muscle fibre.			
Energy transfer during short duration/high intensity exercise. • Anaerobic energy system • ATP-PC system • Short term lactate anaerobic system (lactate accumulation, lactate threshold, OBLA, lactate producing capacity and sprint/power performance.			
Energy transfer during long duration/lower intensity exercise • Aerobic energy system • Oxygen consumption during exercise (maximal and submaximal oxygen deficit). • Oxygen consumption during recovery (excess post-exercise oxygen consumption EPOC)			
Factors effecting VO_2 max/aerobic power			
Measurements of energy expenditure • Indirect calorimetry • Lactate sampling • VO_2 max test • Respiratory exchange ratio (RER)			
Impact of specialist training methods on energy systems • Altitude training • High Intensity Interval Training (HIIT) • Plyometrics • Speed Agility Quickness (SAQ)			
Skill Acquisition			
Skill, Skill continuums and transfer of skills			
Characteristics of skill			
Use of skill continua • Open – closed • Discrete – serial – continuous • Gross – fine • Self-paced – externally paced • High – low • Simple – complex			
Justification of skill placement on each of the continua			
Transfer of learning • Positive • Negative • Zero • Bilateral			
Understanding of how transfer of learning impacts on skill development			
Impact of skill classification on structure of practice for learning.			
Methods of presenting practice • Whole			

• Progressive part • Whole-part-whole.			
Types of practice • Massed • Distributed • Variable • Mental practice			
Understanding how knowledge of skill classification informs practice structure (presentation and type) to allow learning/development of skills.			
Principles and theories of learning and performance			
Stages of learning and how feedback differs between the different stages of learning. • Cognitive • Associative • Autonomous			
Learning plateau • Causes and solutions			
Cognitive theories • Insight learning (Gestalt)			
Behaviourism • Operant conditioning (skinner)			
Social learning • Observational learning (Bandura)			
Constructivism • Social development theory (Vygotsky)			
Understanding of how theories of learning impact of skill development.			
Use of guidance and feedback			
Methods of guidance • Verbal • Visual • Manual • Mechanical			
Understanding of how feedback and guidance impacts on skill development			
Memory Models			
General information processing model, to include			
Input • Senses • Receptors • Proprioception • Perception • Selective attention			
Decision making • Baddeley and Hitch, working memory model memory system • Functions and characteristics of components of working memory model			
Output			
Feedback			
Efficiency of information processing to include:			
Application of Whiting's information processing model to a range of sporting contexts			

Applied understanding of information processing terms within a sporting context. • Environment • Display • Sensory Organs • Perceptual mechanism • Translator mechanism • Effector mechanism • Muscular system output data • Feedback data			
Definitions of and the relationship between reaction time, response time, movement time. • Simple reaction time • Choice reaction time			
Factors affecting response time • Hicks law • Psychological refractory period • Single channel hypothesis			
Definitions of anticipation • Temporal • Spatial			
Strategies to improve response time			
Schmidt's schema theory • Recall • Recognition • Initial conditions • Response specifications • Sensory consequences • Response outcomes • Parameters			
Application of schema theory in sporting situations			
Strategies to improve information processing • Input – selective attention, decision making process – chunking, chaining, response time, schema.			
Sport and Society			
Emergence of globalisation of sport in the 21st century			
Pre-industrial (pre 1780)			
Characteristics and impact on sporting recreation • Rural, local, two-tier class system. Limited to mob football, real tennis and Much Wenlock Olympic Games.			
Characteristics of popular and rational recreation linked to the two-tier class system. • Upper and lower			
Industrial and post-industrial (1980-1900)			
Characteristics and impact on sport (limited to development of association football, lawn tennis and rationalisation of track and field events. • Industrial Revolution • Urbanisation • Transport and communication • The British Empire			

• Provision through factories • Churches and local authorities • Three-tier class system (emphasis on middle class and working class) • Development of national governing bodies • Characteristics of sport • Consideration of the changing role of women in sport • The status of amateur and professional performers.			
Post World War II (1950-present)			
Characteristics and impact on sport (limited to development of association football, tennis and athletics. • Golden triangle – the interrelationship between commercialisation (including sponsorship), media (radio, TV, satellite, internet and social media) and sports and governing bodies. • The changing status of amateur and professional performers • Factors affecting the emergence of elite female performers in football (players and officials), tennis and athletics in late 20th century and early 21st century.			
The impact of sport on society and of society on sport			
Sociological theory applied to equal opportunities			

Understanding of the definitions of the following key terms in relation to the study of sport and their impact on equal opportunities in sport and society.
• Society
• Socialisation
• Social processes
• Social issues
• Social structures/stratification
  ○ Primary and secondary
  ○ Social control and social change
  ○ Causes and consequences of inequality
  ○ E.g. schools/sports clubs			

Understanding social action theory in relation to social issues in physical activity and sport • Interactionist approach, impact of sport on society on sport			
Underrepresented groups in sport • Disability • Ethnic group • Gender • Disadvantaged			
Understanding the terms and equal opportunities, discrimination, stereotyping and prejudice			
The barriers to participation in sport and physical activity and possible solutions to overcome them for under represented groups in sport			
Benefits of raising participation • Health benefits • Fitness benefits • Social benefits			
The interrelationship between Sport England, local and national partners to increase participation at gross roots level and under represented groups in sport.			

Ravens Wood School PE A-Level

Year 2

Factors affecting optimal performance in physical activity and sport

Topic	R	A	G
Exercise Physiology			
Diet and nutrition and their effect on physical activity and performance			
Understanding the exercise-related function of food classes • Carbohydrate • Fibre • Fat (saturated fat, trans fat and cholesterol) • Protein • Vitamins (C, D, B-12, B-complex) • Minerals (sodium, iron, calcium) • Water (hydration before, during and after physical activity)			
Positive and negative effects of dietary supplements/ manipulation on the performer • Creatine • Sodium bicarbonate • Caffeine • Glycogen loading			
Preparation and training methods in relation to maintaining physical activity and performance			
Understanding key data terms for laboratory conditions • Quantitative and qualitative • Objective and subjective • Validity and reliability			
Physiological effects and benefits of a warm up and cool down • Stretching for different types of physical activity (static and ballistic)			
Principles of training • Specificity, progressive overload, reversibility, recovery, Frequency Intensity Time Type of training (FITT) principles			
Application of principles of periodisation • Macro cycle, meso cycle, micro cycle • Preparation, competition, transition • Tapering, peaking			
Training methods to improve physical fitness and health • Interval training (anaerobic power). • Continuous training (aerobic endurance) • Fartlek (aerobic endurance) • Circuit training (muscular endurance) • Weight training (strength) • Proprioceptive Neuromuscular Facilitation (PNF) (flexibility)			
Injury prevention and the rehabilitation of injury			
Types of injury • Acute (fractures, dislocations, strains, sprains). • Chronic (Achilles tendonitis, stress fracture, ‘tennis elbow’).			

Understanding different methods used in injury prevention, rehabilitation and recovery • Injury prevention methods: screening. • Protective equipment. Warm up, flexibility training (active, passive, static and ballistic), taping and bracing. • Injury rehabilitation methods (proprioceptive training, strength training, hyperbaric chambers, cryotheraphy, hydrotherapy. • Recovery from exercise (compression garments, massage/foam rollers, cold therapy, ice bath, cryotheraphy).			
Psychological reasons for methods used in injury rehabilitation. • Hyperbaric chambers, cryotheraphy.			
Importance of sleep and nutrition for improved recovery			
Biomechanical movement			
Biomechanical principles			
Newton's three laws of linear motion applied to sporting movements. • First law (inertia), second law (acceleration), third law (action/reaction). Force.			
Definitions, equations and units of example scalars. • Speed, distance			
Centre of mass			
Factors affecting stability • Height of centre of mass, area of base of support, position of line of gravity and body mass.			
Levers			
Three classes of lever and examples of their use in the body during physical activity and sport.			
Mechanical advantage and mechanical disadvantage of each class of lever.			
Linear motion			
An understanding of the forces acting on a performer during linear motion. • Gravity, frictional force, air-resistance, internal-muscular force, weight.			
Definitions, equations, and units of vectors and scalars. • Mass, weight, speed, velocity, distance, displacement, acceleration and momentum.			
The relationship between impulse and increasing and decreasing momentum in sprinting through the interpretation of force/time graphs.			
Angular motion			
Application of Newton's law to angular motion.			
Definitions and units for angular motion. • Angular displacement, angular velocity, angular acceleration			
Conservation of angular momentum during flight, moment of inertia and its relationship with angular velocity.			
Projectile motion			
Factors affecting horizontal displacement of projectiles.			
Factors affecting flight paths of different projectiles • Shot put, badminton shuttle.			
Vector components of parabolic flight.			
Fluid mechanics			
Dynamic fluid force • Drag and lift			

Factors that reduce and increase drag and their application to sporting situations.			
The Bernoulli principle applied to sporting situations • Upward lift force (discus) • Downward lift force (speed skiers, cyclists, racing cars)			
Sport psychology - Psychological factors that can influence an individual in physical activities			
Aspects of personality			
Understanding of the nature vs nurture debate in the development of personality. • Trait, social learning.			
Interactionist perspective • Hollander, Lewin			
How knowledge of interactionist perspective can improve performance			
Attitudes			
Triadic model • Components of and attitude • Formation of attitudes • Changing attitudes through cognitive dissonance and persuasive communication			
Arousal			
Theories of arousal. • Drive theory, inverted U theory, catastrophe theory and zone of optimal functioning theory			
Practical applications of theories of arousal and their impact on performance.			
Characteristics of peak flow experience.			
Anxiety			
Types of anxiety • Somatic, cognitive, competitive trait and competitive state.			
Advantages and disadvantages of using observations, questionnaires and physiological measures to measure anxiety.			
Aggression			
Difference between aggression and assertive behaviour.			
Theories of aggression. • Instinct theory, frustration-aggression hypothesis, social learning theory and aggressive cue theory			
Strategies to control aggression.			
Motivation			
Motivation • Intrinsic, extrinsic, tangible and intangible			
Achievement motivation theory			
Atkinson's model of achievement motivation			
Characteristics of personality components of achievement motivation • Need to achieve (Nach) and Need to avoid failure (Naf).			
Impact of situational component of achievement motivation • Incentive value and probability of success.			
Achievement goal theory • Impact of outcome orientated goals and task orientated goals			

Strategies to develop approach behaviours leading to improvements in performance.			
Social facilitation			
Social facilitation and inhibition • Zajonc's model			
Evaluation apprehension			
Strategies to eliminate the adverse effects of social facilitation and social inhibition			
Group Dynamics			
Group formation • Tuckman's model			
Cohesion • Task and social			
Steiner's model of potential and actual productivity, fault group processes • Including cooperation and coordination.			
Ringelmann effect and social loafing			
Strategies to improve cohesion, group productivity and overcome social loafing to enhance team performance.			
Importance of goal setting			
Benefits of types of goal setting • Outcome goals, task orientated. • Performance related goals, process goals			
Principles of effective goal setting • SMARTER (specific, measurable, achievable, realistic, time bound, evaluate, re-do).			
Attribution theory			
Attribution process			
Weiner's model and its application to sporting situations			
Link between attribution, task persistence and motivation			
Self-serving bias			
Attribution retraining			
Learned helplessness • General and specific			
Strategies to avoid learned helplessness leading to improvements in performance			
Self-efficacy and confidence			
Characteristics of self-efficacy, self-confidence and self-esteem.			
Bandura's model of self-efficacy • Performance accomplishments, vicarious experiences, verbal persuasion and emotional arousal.			
Vealey's model of self-confidence • Relationship between trait sport confidence, competitive orientation, the sport situation and state sport confidence.			
Effects of home field advantage			
Strategies to develop high levels of self-efficacy leading to improvements in performance.			
Leadership			
Characteristics of effective leaders			

Styles of leadership • Autocratic, democratic, laissez-faire.			
Evaluation of leadership styles for different sporting situations			
Prescribed and emergent leaders			
Theories of leadership in different sporting situations • Fielder's contingency theory and chelladurai's multi-dimensional model			
Stress management			
Explanation of the terms 'stress' and 'stressor'			
Use of warm up for stress management			
Effects of cognitive and somatic techniques on the performer.			
Explanation of cognitive techniques • Psychological skills training (PST) • Mental rehearsal • Visualisation • Imagery • Attention control and cue utilisation • Though stopping • Positive self-talk			
Explanation of somatic techniques • Biofeedback, centering, breathing control, progressive muscle relaxation.			
Sport and society and the role of technology in physical activity and sport			
Concepts of physical activity and sport			
The characteristics and functions of key concepts and how they create the base of the sporting development continuum. • Physical recreation • Sport • Physical education • School sport			
The similarities and the differences between these key concepts			
Development of elite performers in sport			
The personal, social and cultural factors required to support progression from talent identification to elite performance.			
The generic roles, purpose and the relationship between organisations in providing support and progression from talent identification through to elite performance. • National governing bodies • National institute of sport • UK Sport			
The key features of national governing bodies' whole sport plans			
The support services provided by national institutes of sport for talent development.			
The key features of UK Sport's World Class Performance Programme, Gold Event Series and Talent Identification and Development • Or equivalent current named programmes			
Ethics in sport			
Amateurism, the Olympic Oath, sportsmanship, gamesmanship, win ethic			
Positive and negative forms of deviance in relation to the performer.			

Violence in sport			
The causes and implications of violence in sport in relation to the performer, spectator and sport			
Strategies for preventing violence within sport to the performer and spectator.			
Drugs in sport			
The social and psychological reasons behind elite performers using illegal drugs and doping methods to aid performance.			
The physiological effects of drugs on the performer and their performance • Erythropoietin (EPO) • Anabolic steroids • Beta blockers			
The positive and negative implications to the sport and the performer of drug taking. • Physiological adaptations • Social and psychological rewards (for the sport and the performer). • Negative impact on current and future health • Social and psychological repercussions (for the sport and the performer)			
Strategies for elimination of performance enhancing drugs in sport.			
Arguments for and against drug taking and testing • Testing procedures will not be examined			
Sport and the law			
The uses of sports legislation • Performers (contracts, injury, loss of earnings). • Officials (negligence) • Coaches (duty of care) • Spectators (safety, hooliganism).			
Impact of commercialisation on physical activity and sport and the relationship between sport and the media			
The positive and negative impact of commercialisation, sponsorship and the media. • Performer • Coach • Official • Audience • Sport			
The role of technology in physical activity and sport			
Understanding of technology for sport analytics. • Use of technology in data collection (quantitative and qualitative, objective and subjective, validity and reliability of data) • Video analysis programmes • Testing and recording equipment (metabolic cart for indirect calorimetry). • Use of GPS and motion tracking software and hardware • Maintaining data integrity			
Functions of sports analytics • Monitor fitness for performance • Skill and technique development • Injury prevention (vibration, electro stimulation) • Game analysis			

• Talent ID/scouting			
The development of equipment and facilities in physical activity and sport, and their impact on participation and performance • Impact of material technology on equipment – adapted (disability, age). • Facilities – Olympic legacy, (surfaces, multi-use)			
The role of technology in sport and its positive and negative impacts. • Sport • Performer • Coach • Audience			