

## Physiological factors Affecting Performance Roadmap Year 12

<b>Curriculum Intention</b>		Studying A Level PE will equip you with both a depth and breadth of knowledge, understanding and skills relating to; scientific, socio-cultural and practical aspects of physical education. On this course, you will develop theoretical knowledge and understanding of the factors that underpin physical activity in sport and use this knowledge to improve performance. As part of the course, you will also understand how physical activity contributes to health and fitness. Our aim is that you will improve as effective and independent learners and become critical and reflective thinkers with curious and enquiring minds.
<b>Aims and Objectives for Physiological factors affecting performance &amp; NEA component</b>		<ul style="list-style-type: none"> <li>• Understand how physiological states affect performance</li> <li>• Refine ability to perform effectively in physical activity and sport by developing skills and techniques and selecting and using tactics, strategies and/or compositional ideas</li> <li>• Develop ability to analyse and evaluate to improve performance</li> </ul>
<b>Time Scale</b>	<b>Assessment Procedures</b>	<b>Physiological factors Affecting Performance 01: Specification</b>
<b>Sept – Oct H/T</b>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p style="color: green;"><b>10 Mark Question KEY ASSESSMENT 1 (2<sup>nd</sup> October)</b></p>	<p><b><u>Unit 1.1: The skeletal System and muscular system</u></b></p> <ul style="list-style-type: none"> <li>• <b>Skeletal System</b> - Structure and function of; bones, joints and connective tissues and movement patterns.</li> <li>• <b>Muscular System</b> - Muscle groups, roles of muscles and movements produced and types of muscular contraction.</li> <li>• <b>Movement analysis</b> - Analysis of sporting actions in relation to joint type, movement produced, antagonistic pair, plane of movement and type of contraction</li> <li>• <b>Skeletal Muscle Contraction</b> – Structure and role of motor units in skeletal muscle contraction including; motor neurons, action potential, neurotransmitters and the ‘all or none law’.</li> <li>• <b>Muscular system continued</b> – Muscle fibres and recruitment of muscle fibres during exercise of differing intensities.</li> <li>• <b>Effects of exercise on the skeletal and muscular system</b> – Short-term and long-term effects of exercise including skeletal and muscular diseases e.g. osteoporosis.</li> <li>• <b>Effects of a warm-up and cool down on the muscular-skeletal system</b></li> </ul>
<b>Oct H/T - Xmas</b>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p style="color: green;"><b>KEY ASSESSMENT 2 (30<sup>th</sup> November)</b></p>	<p><b><u>Unit 1.1: The cardiovascular system</u></b></p> <ul style="list-style-type: none"> <li>• <b>Structure of the heart</b> –Functions of all heart structures and the pathway of blood through the heart (cardiac cycle)</li> <li>• <b>Conduction system</b> – Transmission of electrical impulse through major components and how the conduction system controls the cardiac cycle</li> <li>• <b>Resting values</b> – definitions and average values for heart rate, stroke volume and cardiac output and how these change from rest to exercise. Study and interpretation of graphs which demonstrate these change.</li> <li>• <b>Venous Return</b> – Knowledge of Venous Return Mechanisms and how this changes during exercise.</li> <li>• <b>Heart rate regulation</b> – roles of receptors and how this is received and transmitted to increase/decrease HR.</li> <li>• <b>Vascular System</b> – Structure and function of veins, arteries, venules, pre-capillary sphincters and arterioles.</li> <li>• <b>Distribution of Cardiac Output from rest to exercise</b> – Vascular shunt mechanism, the role of the vasomotor control centre and the role of arterioles and pre-capillary sphincters to redistribute blood during exercise.</li> <li>• <b>Cardiovascular lifestyle diseases</b> – Knowledge of CHD, strokes, atherosclerosis, arteriosclerosis and heat attacks. Understand how CHD can be prevented and the impact CHD has on health and the cardiovascular system.</li> </ul>

<p>Xmas -Feb H/T</p>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p>10 Mark Question KEY ASSESSMENT 3 (30<sup>th</sup> January)</p>	<p><b>Unit 1.1: The respiratory system</b></p> <ul style="list-style-type: none"> <li>• <b>Structure of the respiratory system</b> – internal and external intercostal muscles, lungs, ribcage, diaphragm and the thoracic cavity in terms of volume and pressure.</li> <li>• <b>Mechanics of breathing</b> – inspiration and expiration and how this changes from rest to exercise</li> <li>• <b>Resting Values</b> – Breathing frequency, tidal volume and minute ventilation</li> <li>• <b>Regulation of breathing</b> – role of RCC at rest and during exercise, how the inspiratory and expiratory centre control changes to breathing. Know how neural controls cause changes to mechanics of breathing during exercise.</li> <li>• <b>Gaseous exchange</b> – internal and external sites, partial pressures of gases and diffusion gradient</li> <li>• <b>Oxygen Dissociation Curve</b> – structure of haemoglobin, binding process of oxygen and the release of oxygen from haemoglobin at rest and during exercise. Knowledge of the Bohr effect (how the curve ‘shifts’ during exercise).</li> <li>• <b>Respiratory Lifestyle Diseases</b> – asthma, smoking and chronic obstructive pulmonary disease.</li> </ul>
<p>Feb H/T – Easter</p>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p>Assessed Extended Writing Task (February)</p>	<p><b>Unit 1.1: Environmental effects on body systems</b></p> <ul style="list-style-type: none"> <li>• <b>Effect of altitude on the cardiovascular and respiratory systems</b> – reduced arterial PO<sub>2</sub> (partial pressure of oxygen), impaired muscle O<sub>2</sub> delivery, elevated heart rate and ventilation.</li> <li>• <b>Conditions associated with altitude training</b> – sickness, hypoxia, chronic mountain sickness, high altitude cerebral edema and high altitude pulmonary edema</li> <li>• <b>Acclimatisation</b> – the importance of timing arrival, at altitude (above 2400m)</li> <li>• <b>Effect of heat on the cardiovascular and respiratory systems</b> – humidity, temperature regulation and cardiovascular drift</li> </ul>
<p>Eater – May H/T</p>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p>KEY ASSESSMENT 4 (24<sup>th</sup> April)</p>	<p><b>Unit 1.2: Diet and Nutrition and ergogenic aids</b></p> <ul style="list-style-type: none"> <li>• <b>Functions and importance of the components of a healthy balanced diet</b> – students to understand the seven components of a healthy balanced diet, how these change dependent on the sport which athletes partake.</li> <li>• <b>Energy Balance</b> - How energy balance is achieved through energy intake and energy expenditure through physical activity and performance.</li> <li>• <b>Nutritional Aids – Hydration, Carbo loading</b> – including the application of these for various sports.</li> <li>• <b>Nutritional aids</b> – Students to develop their knowledge of; creatine, caffeine, bicarbonate and nitrates and understanding of how each of these benefit sporting performance.</li> <li>• <b>Pharmacological aids</b> - anabolic steroids, erythropoietin and human growth hormone.</li> <li>• <b>Physiological aids</b> - blood doping, intermittent hypoxic training and cooling aids.</li> </ul>
<p>May H/T – End of Year</p>	<p>Peer, self and teacher assessment and assessed exam questions</p> <p>KEY ASSESSMENT 5 (25<sup>th</sup> June)</p>	<p><b>Unit 1.2: Preparation and training methods in relation to improving and maintaining physical activity and performance</b></p> <ul style="list-style-type: none"> <li>• <b>Periodisation cycles</b> – Micro, meso and macro cycles.</li> <li>• <b>Phases of training</b> – preparatory, competitive and transition phases.</li> <li>• <b>Principles of training</b> – MRS VOPPS TWC</li> <li>• <b>Aerobic capacity and maximal oxygen uptake (VO<sub>2</sub> max)</b> – what is VO<sub>2</sub> max is and how this is affected.</li> <li>• <b>Methods of evaluating</b> – direct gas analysis, M-S fitness test, Queen’s college step test and the Cooper 12-minute run.</li> <li>• <b>Intensity and duration of training used to develop aerobic capacity</b> – continuous and HIIT</li> <li>• <b>Physiological adaptations from aerobic training</b> –adaptations to the; cardiovascular, respiratory, muscular and metabolic systems.</li> </ul>