

PEFORMANCE STUDIES (GCSE PE)
ANATOMY & PHYSIOLOGY 2 (CARDIOVASCULAR & RESPIRATORY SYSTEMS)
SCHEME OF LEARNING OVERVIEW

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p>In the key stage three science curriculum, students will study biology which covers the following key areas which provides fundamental understanding for the study of anatomy and physiology at GCSE PE. Students will learn the role of diffusion in the movement of materials in and between cells, the structure and functions of the gas exchange system in humans, including adaptations to function, and the mechanism of breathing to move air in and out of the lungs. This knowledge will be required for this scheme of learning.</p> <p>Firstly, students will develop their knowledge and understanding of the structure and function of the cardiovascular system. Blood vessels and blood cells with their pathway through the heart will be understood along with definitions of key cardiac terms. They will understand the pathway of air through the respiratory system and know the role of the respiratory muscles and alveoli during breathing, along with an understanding of key definitions. Students will also be able to define aerobic and anaerobic exercise and be able to give practical examples of aerobic and anaerobic activities. Finally, students will develop</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> - Know the double-circulatory system (systemic and pulmonary) - know the different types of blood vessel - understand the pathway of blood through the heart - know the definitions of heart rate, stroke volume and cardiac output - know the role of red blood cells - Understand the pathway of air through the respiratory system - know the role of respiratory muscles in breathing - know the definitions of breathing rate, tidal volume and minute ventilation - understand about alveoli as the site of gas exchange - know the definitions of aerobic and anaerobic exercise - be able to apply practical examples of aerobic and anaerobic activities in relation to intensity and duration - understand the short-term effects of exercise on the body systems - be able to apply the effects to 	<ul style="list-style-type: none"> • <i>Aerobic exercise - Use of oxygen for the duration of the exercise. Usually at moderate intensity at a continuous rate.</i> • <i>Anaerobic exercise - Exercise which does not allow for the predominant usage of oxygen. Usually high or very high intensity for a short period of time.</i> • <i>Blood vessels - Tubular structures that carry blood around our bodies.</i> • <i>Breathing rate - The number of breaths taken in a minute.</i> • <i>Capillarisation - The development of blood capillaries in the body which increases through long term effects of exercise.</i> • <i>Cardiac output - The volume of blood pumped per minute by each ventricle of the heart. Cardiac output = stroke volume x heart rate.</i> • <i>Double circulatory system - Systemic: the circulatory loop that controls blood flow from the heart to the rest of the working muscles and organs. Pulmonary: the circulatory loop that controls blood flow from the heart to the lungs.</i> • <i>Gas exchange - The movement of gases taking place at the alveoli and capillaries.</i> • <i>Heart rate - Number of heart beats per minute.</i> • <i>Hypertrophy - The increase in size of skeletal or cardiac muscle, often as a result of training or exercise.</i> • <i>Lactic acid - A waste product produced in the muscle tissues during strenuous exercise where the anaerobic energy system is in use</i>

<p>their knowledge and understanding of the short and long-term effects of exercise on muscles and bones, the heart and the respiratory system. They will be able to apply understanding of these effects to examples from a range of physical activities and sports.</p> <p>Teaching the content in this order enables students to develop their understanding of how the cardiovascular and respiratory systems work together to enable effective muscular function in a sport and physical activity setting. Students will go on to apply this understanding in the examination paper 1.</p>	<p>examples from physical activity/ sport</p> <ul style="list-style-type: none"> - be able to collect and use data relating to short-term effects of exercise. - understand the long-term effects of exercise on the body systems - be able to apply the effects to examples from physical activity/ sport - be able to collect and use data relating to long-term effects of exercise. - Know and understand how to apply this to exam style questions 	<ul style="list-style-type: none"> • <i>Minute ventilation - The volume of gas inhaled or exhaled from the lungs per minute.</i> • <i>Recovery rate - The speed at which the body returns back to normal after exercise.</i> • <i>Redistribution of blood - When you exercise the blood is diverted from inactive areas to the muscles that are being used. This action is completed through vasodilation and vasoconstriction Also known as the vascular shunt mechanism.</i> • <i>Stroke volume - The amount of blood pumped out of the heart (left ventricle - to the body) during each contraction.</i> • <i>Tidal volume - The amount of air which enters the lungs during normal inhalation at rest.</i> 	
<p style="text-align: center;">Challenge and Support:</p>		<p style="text-align: center;">Worldwide learning/ links to 21st century:</p>	<p style="text-align: center;">Cultural capital/ Industry/ Enrichment:</p>
<p>This scheme of learning is ambitious for all students. Throughout each lesson the Emerging, Developing, Secure and Mastered criteria is aimed at the highest achievers to score level 9 grades at GCSE PE theory. Throughout the course, students are required to apply their understanding to sporting contexts and in each lesson, the Mastered task is application of knowledge to a sporting scenario and/or exam questions.</p> <p>Lessons contain regular and quick extension tasks to challenge more able students whilst students who may require support to access learning are provided with sentence starters and key words, which keeps motivation high.</p> <p>Throughout the lessons, the content is covered and assessed at a low stakes level through mini whiteboards and mass question/answer sessions whereby every student is required to answer. Tasks are short and concise to hold students attention and allows the teacher to ascertain knowledge and understanding. This supports students who may become overwhelmed with longer drawn out tasks, whilst more able students are</p>		<p>Students will be able to make links between the processes of training learned in the previous schemes of learning and the long term-effects of exercise. In 21st century sport, athletes apply principles of training in order to make these adaptations to the body systems. This is what has increased the level of sports performance across the world. The new understanding of fitness and the body has pushed the performance levels of all sports up much higher than in previous years.</p>	<p>Understanding of how the body responds to exercise and the long term effects that can be made through training programmes is important for careers in coaching and sports performance. Students will be able to combine this knowledge with that of other schemes of learning to effectively train themselves, or others, effectively in a sporting or employment setting. They will understand the difference between aerobic and anaerobic endurance and be able to select appropriate training methods for the situation that</p>

supplemented with extension tasks.			manifests.
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:	
Students will develop an appreciation and detailed understanding of how the body is able to take oxygen from the air and transport it to our working muscles. This appreciation of the body will lead to students proactively looking after their bodies throughout their lives, and educating others on the importance of maintaining healthy lungs and heart. It is emphasised how important it is to have a healthy diet and avoid smoking and excessive alcohol to ensure fully functioning lungs and heart.	There are many links to human biology in this scheme of learning, whereby students will be learning about the heart and cardiovascular system. In addition, students will learn the respiratory system including breathing mechanics and gaseous exchange. Students will also need to know the concept of diffusion which is vital understanding in science subjects.	Breathing mechanics is often a subject which can be misconceived if careful explanations are not given. Students can become confused with the muscles that contract and relax during inspiration and expiration. In addition, the role of air pressure whilst breathing can be misunderstood. For this reason, a model is used to show air pressure which is related to the lungs. Gaseous exchange is also an area that can be misunderstood. Videos and visual diagrams are used extensively to show substances moving across a concentration gradient, which is then linked to the alveoli and capillaries.	
Assessment timeline:			
<p>For formative assessment purposes, every lesson is structured using Emerging, Developing, Secure and Mastered criteria. These guide the lesson content that gets progressively harder throughout the lesson. After each, a progress check takes place on mini whiteboards. This enables the teacher to ascertain learning and intervene if required for individuals or the class.</p> <p>When setting tasks in lessons, the resources include WAGOLLS to assist students in structuring their work. These WAGOLLS include sentence starters and key words.</p> <p>At the end of the scheme of learning, students will complete a revision lesson. This will be all whiteboard work covering the content of the scheme through questioning and answering. Students will complete a self-assessment sheet throughout the lesson to note down topic areas they need to develop before the end of unit assessment.</p> <p>The final lesson of the unit will see students completing an end of unit assessment. The assessment will consist of exam style questions of various lengths and will last for 1 hour. The scores from this assessment is used to inform tracking alongside the practical data from students' performances in their three sports.</p> <p>For students that significantly perform below their ALPs target grade, the teacher will complete a small number of coaching sessions before a re-test is completed to ensure that students do not fall behind in any topics.</p>			

Home learning

Lesson 6 – Students to create a revision resource for the short and long term effects of exercise on the body systems

Lesson 7 – Students will revise thoroughly for their end of unit assessment

Feedback

Lessons 1, 2 and 3 contain a series of written application tasks. The teacher will mark these pieces of work and give next steps if understanding is not correct. For correct responses praise or an extension task may be given.

In lessons 2, 3, 4, 5, 6 and 7, students will complete exam style questions and will mark their peers work in green pen using the mark scheme. They will provide a mark, what went well and even better if.

Students will complete an end of unit assessment for the final lesson of the scheme. The assessment will consist of exam style questions of various lengths and will last for 1 hour. The teacher will give a percentage score and level (based on the previous exam cohort national averages) along with highly specific and individualised feedback 4 for each child. This will contain next steps for students to act upon and address either knowledge or exam technique.

Length of unit (duration indicated in hours)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Unit:																													

Note – Above is in hours as some lessons are two hours long. There 7 x 1hour and 2 x 2 hour lessons in this scheme of learning