

## YEAR 9 GCSE PE Learning Programme

2nd Half Term	Pathway of air.	<p>Identification of the pathway of air (limited to):</p> <ul style="list-style-type: none"> <li>• mouth/nose</li> <li>• trachea</li> <li>• bronchi</li> <li>• bronchioles</li> <li>• lungs</li> <li>• alveoli.</li> </ul> <p>Teaching should focus on the location of each of these although the characteristics and function of the alveoli must be covered within gaseous exchange.</p>	<p>Names of pathways. Order of pathways. Identification of pathways on diagrams. Characteristics and functions of the alveoli.</p>	<p>Subject specific vocabulary Command words</p> <p>Hodder textbook, chapter 1</p>	<p>Assessment through peer and self-assessment.</p> <p>End of unit tests</p> <p>Year 9 GCSE Work booklet.</p>
	Gaseous exchange.	<p>Gas exchange at the alveoli – features that assist in gaseous exchange:</p> <ul style="list-style-type: none"> <li>• large surface area of alveoli</li> <li>• moist thin walls (one cell thick)</li> <li>• short distance for diffusion (short diffusion pathway)</li> <li>• lots of capillaries</li> </ul>	<p>Identify features/ characteristics. Identify features/ characteristics on a diagram. Understand the role of haemoglobin in the transport of oxygen and carbondioxide. Explain how the features/ characteristics assist with gaseous exchange.</p>	<p>Subject specific vocabulary Command words Hodder textbook, chapter 1</p>	

		<ul style="list-style-type: none"> <li>• large blood supply</li> <li>• movement of gas from high concentration to low concentration.</li> </ul> <p>Oxygen combines with haemoglobin in the red blood cells to form oxyhaemoglobin. Students should also know that haemoglobin can carry carbon dioxide.</p> <p>Teaching should focus on the characteristics and how these characteristics assist with gaseous exchange.</p>			
	Blood vessels.	<p>Structure of arteries, capillaries and veins:</p> <ul style="list-style-type: none"> <li>• size/diameter</li> <li>• wall thickness</li> <li>• valves in veins.</li> </ul> <p>Teaching should focus on differentiating between the vessel types so that students can explain the vessels and/or identify each vessel from illustrations.</p> <p>How the structure of each blood vessel relates to the function:</p>	<p>Name the vessels.</p> <p>Describe the vessels (diameter etc).</p> <p>Identify the vessels from an illustration.</p> <p>Apply the structure to the function of each vessel.</p> <p>Assess each vessels relative importance.</p> <p>Further apply the learning to the vessels entering/ exiting the heart.</p>	<p>Subject specific vocabulary</p> <p>Command words</p> <p>Hodder textbook, chapter 1</p>	

		<ul style="list-style-type: none"> <li>• carrying oxygenated/ deoxygenated blood to/ from the heart</li> <li>• gas exchange</li> <li>• blood pressure</li> <li>• redistribution of blood during exercise (vasoconstriction and vasodilation).</li> </ul> <p>Students should know the names of the arteries and veins associated with blood entering and leaving the heart.</p> <p>Teaching should focus on the student's ability to explain the function of each vessel and their relative importance. The vessels entering/leaving the heart should be identified from a diagram.</p>			
	Structure of the heart.	<p>Structure of the heart:</p> <ul style="list-style-type: none"> <li>• atria (left and right atria)</li> <li>• ventricles (left and right ventricles).</li> </ul> <p>Teaching should focus on the positioning of the left and right atria/ventricles, linking them to</p>	<p>Names of the chambers. Position within the heart. Basic role of each chamber. Correlate the chamber to the adjoining vessels.</p>	<p>Subject specific vocabulary Command words</p> <p>Hodder textbook, chapter 1 Heart diagram (see appendix 4)</p>	

		the vessels above. Teaching should include illustrations of the heart.			
	The cardiac cycle and the pathway of the blood.	<p>The order of the cardiac cycle, including diastole (filling) and systole (ejection) of the chambers. This starts from a specified chamber of the heart, eg the cardiac cycle starting at the right ventricle.</p> <p>Pathway of the blood:</p> <ul style="list-style-type: none"> <li>• deoxygenated blood into right atrium</li> <li>• then into the right ventricle</li> <li>• the pulmonary artery then transports deoxygenated blood to the lungs</li> <li>• gas exchange occurs (blood is oxygenated)</li> <li>• pulmonary vein transports oxygenated blood back to the left atrium</li> <li>• then into the left ventricle</li> <li>• before oxygenated blood is ejected and</li> </ul>	<p>Re-cap of heart chambers/ vessels.</p> <p>Order of the cardiac cycle.</p> <p>Understanding of the cardiac cycle from different starting points.</p> <p>Identification of the cardiac cycle in relation to illustrated diagrams.</p> <p>Full knowledge and understanding linked to blood vessels/systole/diastole.</p>	<p>Subject specific vocabulary</p> <p>Command words</p> <p>Hodder textbook, chapter 1</p>	

		<p>transported to the body via the aorta.</p> <p>Valve names are not required but students should be taught that valves open due to pressure and close to prevent backflow.</p> <p>Teaching should focus on the cardiac cycle but students should be encouraged to identify the cycle from different starting points and via diagrams of the heart.</p>			
	Cardiac output and stroke volume.	<p>Cardiac output, stroke volume and heart rate, and the relationship between them.</p> <p>Cardiac output (Q) = stroke volume x heart rate.</p> <p>Students should be able to interpret heart rate graphs, including an 'anticipatory rise', and changes in intensity.</p> <p>Teaching should allow students to analyse graphs, draw their own and make use of varying data to illustrate heart rate changes.</p>	<p>Know the terms.</p> <p>Understand the relationship to calculate cardiac output.</p> <p>Be able to analyse data and spot changes in heart rate.</p> <p>Plot graphs to demonstrate heart rate data that can be explained/ analysed.</p>	<p>Subject specific vocabulary</p> <p>Command words</p> <p>Hodder textbook, chapter 1</p>	
	Mechanics of breathing – the interaction of the intercostal muscles, ribs and diaphragm in breathing.	<p>Inhaling (at rest) with reference to the roles of the:</p> <ul style="list-style-type: none"> <li>• intercostals</li> <li>• rib cage</li> </ul>	<p>Name the anatomical parts involved.</p> <p>Explain how these work together during inhalation.</p>	<p>Subject specific vocabulary</p> <p>Command words</p> <p>Hodder textbook, chapter 1</p>	

		<ul style="list-style-type: none"> <li>• diaphragm.</li> </ul> <p>Exhaling (at rest) with reference to the roles of the:</p> <ul style="list-style-type: none"> <li>• intercostals</li> <li>• rib cage</li> <li>• diaphragm.</li> </ul> <p>Teaching should facilitate student knowledge that the lungs can expand more during exercise (inspiration) due to the use of pectorals and sternocleidomastoid. During exercise (expiration), the rib cage is pulled down quicker to force air out quicker due to use of the abdominal muscles. No other muscles are needed. Changes in air pressure cause the inhalation and exhalation.</p>	<p>Explain how these work together during exhaling (including the role of other muscles). Evaluate their role, eg evaluate the role of the diaphragm.</p>		
	Interpretation of a spirometry trace.	<p>Identification of the following volumes on a spirometer trace and an understanding of how these may change from rest to exercise:</p> <ul style="list-style-type: none"> <li>• tidal volume</li> <li>• expiratory reserve volume</li> <li>• inspiratory reserve volume</li> </ul>	<p>Names of the lung volumes. Explain what each volume is. Be able to identify each on a spirometer trace. Be able to interpret/analyse each on a spirometer trace. Be able to predict what each will do based on. information/ draw</p>	<p>Subject specific vocabulary Command words</p> <p>Hodder textbook, chapter 1 Example spirometer trace (see appendix 5)</p>	

		<ul style="list-style-type: none"><li>• residual volume.</li></ul> Teaching should enable students to Interpret and explain a spirometer trace (and continue a trace on paper) to reflect the difference in a trace between rest and the onset of exercise. Students should be able to analyse and draw traces.	continuation of the trace.		
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