

## Unit of Work – Science Unit 8C Breathing and Respiration– Year 8

Year /Group	Unit or Activity	Focus – skills and knowledge development	(Subject) Programme of Study Reference	Curriculum, learning opportunities	PLTS	Number of lessons
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8	8C –Breathing and Respiration	<p>Knowledge: Under the broad theme of water sports, this unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans.</p> <p>Skills: Fair –testing-identifying variables, designing method, evaluate method In addition to covering a variety of Working Scientifically statements, this unit has a focus on: • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • apply mathematical concepts and calculate results.</p>	<p>Term 1-8A/8B This unit covers the following statements from the UK National Curriculum for Science (2013) • 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 •the mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume • the impact of exercise, asthma and smoking on the human gas exchange system• the role of leaf stomata in gas exchange in plants• aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life• a word summary for aerobic respiration • the process of anaerobic respiration in humans and <u>microorganisms, including fermentation</u>, and a word summary for anaerobic respiration • the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism. N.B. Statements underlined are covered in another unit (8D).</p>	<p><b>Pupils will have 7 lessons per unit as part of a 2 unit block. Students will cover 3 blocks of 2 units per term</b></p> <p><b>Cross curricular</b> 8Ca – Chemistry 8Ea – combustion 8Cb – Physics 8Ic – pressure in fluids – Biology 8Ae – surface area 8Cb – PE – effects of exercise on pulse and breathing rates 8Cc – History – use of chemical weapons, for example, in the First World War</p>	<p><u>Independent enquiry</u>-plan and carry out practical and investigative activities, both individually and group. <u>Self-management</u>-assess risk and work safely in the laboratory.</p>	<p><b>7 -8C</b> (7-8C.1 test I intervention 16 in total)</p>
<b>(Subject) Learning Intentions</b>					<b>Cross Curricular Objectives</b>	

<p>Lesson 1-Aerobic Respiration- LI to understand what is aerobic respiration?</p> <ul style="list-style-type: none"> <li>● Recall what happens in respiration</li> <li>● Describe how combustion and respiration are similar</li> <li>● Investigate the relationship between exercise and oxygen demand.</li> </ul> <p>Lesson 2-Gas Exchange Systems- LI to understand how gases are exchanged in the lungs</p> <ul style="list-style-type: none"> <li>● Recall the structures of the gas exchange system</li> <li>● Explain how the lungs are adapted for efficient gas exchange</li> <li>● Investigate the relationship between height and tidal volume</li> </ul> <p>Lesson 3-Means and ranges-LI – to investigate exercise on pulse how means and ranges are calculated and how we use them</p> <ul style="list-style-type: none"> <li>● Recall the meanings of mean and range</li> <li>● Investigate relationship between pulse and exercise</li> <li>● Analyse results to calculate mean and identify the range of data</li> </ul> <p>Lesson 4- Getting Oxygen - LI-to understand how oxygen travels from lungs to rest of the body.</p> <ul style="list-style-type: none"> <li>● Describe how breathing rate will increase when you exercise</li> <li>● Explain how blood transports oxygen to the cells</li> <li>● Investigate relationship between tidal volume/pulse and exercise</li> </ul> <p>Lesson 5-getting Oxygen (part II)-LI-to understand the impact of narrowing vessels, poisons and poor gas exchange system?</p> <ul style="list-style-type: none"> <li>● State dangerous chemicals found in cigarette smoke</li> <li>● Describe the function of each part of the digestive system</li> <li>● Explain the effects of a reduction of oxygen to cells</li> </ul> <p>Lesson 6- Different gas exchange systems-LI- To</p> <ul style="list-style-type: none"> <li>● Describe how gas exchange occurs in plants</li> <li>● Describe ways in which respiration can be detected (Lime water etc)</li> <li>● Compare human gas exchange systems with those of other animals</li> </ul> <p>Lesson 7-Anaerobic Respiration LI- to understand how anaerobic respiration takes place?</p> <ul style="list-style-type: none"> <li>● Describe what anaerobic respiration is</li> <li>● Describe how lactic acid is removed from the body</li> <li>● Explain why aerobic and anaerobic respiration can take place at the same time</li> </ul> <p>Lesson 8 Formative assessment- see folder for task and mark scheme.</p>	<p><b>Literacy: summarising texts.</b> how verbs and adjectives can be used to add ‘weight’ to an opinion bias. KEY SKILLS/words Aerobic respiration Anaerobic respiration Saturation Diaphragm Ventilation Diffusion Mean range tidal volume nicotine carbon monoxide stomata gills counter-current mechanism lactic acid</p> <p><b>Numeracy:</b> identify the ranges of readings in data ● explain why data with a small range is of good quality ● calculate means and explain their use ● identify anomalous results in data.</p> <p><b>Thinking Skills:</b></p> <p><b>ICT:</b></p> <p><b>Communication:</b> Information can be presented in different ways to communicate scientific ideas clearly. This includes understanding how sentences can be constructed to show cause and effect.</p> <p><b>SMSC:</b></p>	
<p><b>Assessment Criteria / Expectations – including formative and feedback</b> (<b>How:</b> 8C End of unit test. <b>When :</b> lesson 8 <b>By whom :</b> class teacher )</p>	<p><b>Resources</b> Active Learn Web site. Google Drive- Folder 8A</p>	<p><b>Continuity and Progression</b> (link/development of previous learning objectives/units/achievements)</p>
<p>Summative unit test: 8C/D (Taken at end of 2 unit block as part of a 2 unit test, teacher assessed.) Skills task: Specify practical write up/planning task from your unit. (Completed during unit, teacher assessed.) <u>Key skills.</u>  Calculating heart rates/graphs. Evaluating data especially scatter diagrams Key practical’s- Inhaled and exhaled air- difference between.</p>	<p>Resources from 8C Exploring Science.  Located on Drive: Science Department 2016-17 /KS3/Y8/8C</p>	<p>From KS2 most students will be able to: ● recall how cells, tissues, organs and organ systems are related (7A) ● describe how some cells are adapted for certain functions (7A, 7B, 7C) ● recall that respiration and breathing are not the same (7C)</p>

Pulse rates measuring.

- describe how certain drugs affect the body (7C)
- describe how the circulatory system carries food and oxygen around the body (7C)
- describe diffusion (7G)
- explain the concept of air pressure (7G).

# Week by Week SCHEME OF WORK & ASSESSMENT for (Science–Unit 8A / Year 8)

Date/Week	Subject content/Topic	Knowledge base – link to previous learning	Skills in focus	Students’ programme of study and activities	Assessment: method, feedback and improvement – shared with all	Resources: hyperlink or physical location for all	Homework
Week (1)  Number of lessons: 3  Unit: 8C  Dates:	Lesson 1-3 Topic 8Ca starts with a look at why humans need air and how the discoveries of Boyle, Mayow, Priestley and Lavoisier helped to shape our modern understanding of aerobic respiration.	Know that carbohydrates give us energy (8A). Oxygen is needed for combustion (8F)	Practical investigation skills, use oximeter to test oxygen saturation of blood when at rest and when exercising. Analysis of results.	3 powerpoint lessons. Associated worksheets/activities.	In-built activities to summarise learning. Opportunities for Peer/Self assessment within each lesson.	Active learn website <a href="http://www.activeteachonline.com">www.activeteachonline.com</a>  Drive: <a href="https://drive.google.com/drive">https://drive.google.com/drive</a>	Core homework on Science Drive. Self contained worksheets can also be used for homework
Resources and general notes All lessons/activities are on power point slides- with suggestions for extension activities and the folder includes ALL the worksheets (plus extra) for the lessons.							
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Week (2)  Number of lessons: 3  Unit: 8C  Dates:	Lesson 4-6 Topic 8Cb looks in more detail at the human gas exchange system, including how breathing occurs and the importance of surface area in gas exchange. A Working Scientifically spread, which shows how ranges and means are calculated, follows this, and will help students to process results from practical work on the effects of exercise on breathing and pulse rates. Topic 8Cc considers the role of blood in transporting oxygen to tissues and how a lack of oxygen can affect cells. This is followed by a Literacy & Communication spread on writing different types of paragraph.	Know the names of the different parts of the gas exchange system. describe how soluble substances are carried by the blood (7C)	Practical investigation skills, exercise , pulse/ tidal volume, identify range and calculate mean Analysis of results. Thinking Skills.	3 powerpoint lessons. Associated worksheets/activities.	In-built activities to summarise learning. Opportunities for Peer/Self assessment within each lesson.	Active learn website <a href="http://www.activeteachonline.com">www.activeteachonline.com</a>  Drive: <a href="https://drive.google.com/drive">https://drive.google.com/drive</a>	Core homework on Science Drive. Self contained worksheets can also be used for homework
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Week (3)  Number of lessons: 3  Unit: 8C  Dates:	Lesson 7 Understand anaerobic respiration; explain how lactic acid is removed from the body.  Test	describe how soluble substances are carried by the blood (7C)	Note taking, recall information. Applying knowledge.  Extracting information to answer questions.  Revision	1 powerpoint lesson. Associated worksheets/activities.  Quick Quiz to assess learning from unit.  Test: formative assessment.	In-built activities to summarise learning. Opportunities for Peer/Self assessment within the lesson.	Active learn website <a href="http://www.activeteachonline.com">www.activeteachonline.com</a>  Drive: <a href="https://drive.google.com/drive">https://drive.google.com/drive</a>	Core homework on Science Drive. Self contained worksheets can also be used for homework

	Intervention lessons based on test results.						
	Resources and general notes All lessons/activities are on powerpoint slides- with suggestions for extension activities and the folder includes ALL the worksheets (plus extra) for the lessons.						

**(Plan in intervention time to each unit)**