

Year 11 Biology Curriculum

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	ACP and VAA development:	Home learning and enrichment
SB8/CB8	Content which is only in Separate Biology is Highlighted in Bold 8.1 Describe the need to transport substances into and out of a range of organisms, including oxygen, carbon dioxide, water, dissolved food molecules, mineral ions and urea 8.2 Explain the need for exchange surfaces and a transport system in multicellular organisms including the calculation of surface area : volume ratio 1a, 1c 5c 8.3 Explain how alveoli are adapted for gas exchange by diffusion between air	Content which is only in Separate Biology is Highlighted in Bold - Efficient Transport and Exchange Factors Affecting Diffusion - The Circulatory System - The Heart - Cellular Respiration - Core Practical – Respiration Rates	Separate Science: End of Unit Assessment for SB8 Census Assessment 1 will assess Paper 1 content and will be a full past Paper 1. Combined: End of Unit Assessment for CB8. Census Assessment 1 will assess Paper 1 content and will be a full past Paper 1.	Use of mathematics - Demonstrate an understanding of number, size and scale and the quantitative relationship between units (2a and 2h). - Calculate with numbers written in standard form (1b). - Calculate surface area : volume ratios (1c). - Plot, draw and interpret appropriate graphs (4a, 4b, 4c and 4d).	VAA Hard Working: Resilience – Select and self-manage extended and complex tasks consistently to completion. Are deliberately unwilling to allow adversity to prevent them from reaching their goal and are unswerving in their focus and their eventual success. ACP Linking: Big Picture Thinking – Explore the complexities and uncertainties in big ideas and holistic concepts and accept that they have limitations. Analysing: Critical or Logical Thinking – Ask perceptive and insightful	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework. There will be revision homework before each Census Assessment and Topic Test.

	in the lungs and blood in capillaries 8.4B Describe the factors affecting the rate of diffusion, including surface area, concentration gradient and diffusion distance 8.5B Calculate the rate of diffusion using Fick's law: surface area concentration difference diffusion thickness of membrane rate of $\times$ $\propto$ 1a 3a, 3d 8.6 Explain how the structure of the blood is related to its function: a red blood cells (erythrocytes) b white blood cells (phagocytes and lymphocytes) c plasma d platelets 1b 2h 8.7 Explain how the structure of the blood	7. End of Unit Assessment 8. Therapy and Exam Questions		• Translate information between numerical and graphical forms (4a). • Construct and interpret frequency tables and diagrams, bar charts and histograms (2c). • Extract and interpret information from graphs, charts and tables (2c and 4a). • Extract and interpret data from graphs, charts, and tables (2c). • Use percentiles and calculate percentage gain and loss of mass (1c).	questions and develop relevant hypotheses. Critically analyse and synthesise evidence and assess it for validity. Use robust evidence to develop compelling new ideas and hypotheses.	
--	--	---	--	--	--	--

	vessels is related to their function 1a 8.8 Explain how the structure of the heart and circulatory system is related to its function, including the role of the major blood vessels, the valves and the relative thickness of chamber walls 8.9 Describe cellular respiration as an exothermic reaction which occurs continuously in living cells to release energy for metabolic processes, including aerobic and anaerobic respiration 8.10 Compare the process of aerobic respiration with the process of anaerobic respiration 8.11 Core Practical: Investigate the rate of					
--	--	--	--	--	--	--

	respiration in living organisms 1a 2a, 2c, 2f 4a, 4c 8.12 Calculate heart rate, stroke volume and cardiac output, using the equation cardiac output = stroke volume × heart rate 1a 2a, 2c 3a 4a, 4c					
SB9/CB9	9.1 Describe the different levels of organisation from individual organisms, populations, communities, to the whole ecosystem 9.2 Explain how communities can be affected by abiotic and biotic factors, including: a temperature, light, water, pollutants b competition, predation 4a, 4c 9.3 Describe the importance of	1. Ecosystems 2. Energy Transfer 3. Abiotic Factors and Communities 4. Core Practical – Quadrats and Transects 5. Biotic Factors and Communities 6. Assessing Pollution 7. Parasitism and Mutualism	Separate Science End of Unit Assessment for SB9 PPE will be a modified past exam Paper 2. This assessment will inform Census 2. Combined Science End of Unit Assessment for CB9 PPE will be a modified past exam Paper 2. This	Use of mathematics ● Calculate surface area : volume ratios (1c). ● Plot, draw and interpret appropriate graphs (4a, 4b, 4c and 4d). ● Understand and use percentiles and calculate percentage gain	VVAs Empathetic: Concerned for society – analyse how different circumstances, belief systems and emotions influence events and act independently according to their own belief systems. Challenge injustice and take the needs of future generations into account. Empathetic: Confident – critically reflect on their knowledge, understanding and ideas	Homework: retrieval quizzing which will assess both current learning and learning from previous years. Homework will be set on Educake, Century Tech, Isaac Physics or Seneca Premium. Exam questions may also be set as homework. There will be revision homework before each Census Assessment and Topic Test.

	interdependence in a community 9.4 Describe how the survival of some organisms is dependent on other species, including parasitism and mutualism 9.5 Core Practical: Investigate the relationship between organisms and their environment using field-work techniques, including quadrats and belt transects 1c, 1d, 2b, 2c, 2d, 2f, 2g, 4a, 4c 9.6 Explain how to determine the number of organisms in a given area using raw data from field-work techniques, including quadrats and belt transects 1c, 1d 2b, 2c, 2d, 2g 4a, 4c	8. Biodiversity and Humans 9. Preserving Biodiversity 10. Food Security 11. The Water Cycle 12. The Carbon Cycle 13. The Nitrogen Cycle 14. Rates of Decomposition 15. End of Unit Assessment 16. Revision and Therapy	assessment will inform Paper 2.	and loss of mass (1c). ● Translate information between numerical and graphical forms (4a). ● Construct and interpret frequency tables and diagrams, bar charts and histograms (2c). ● Understand the principles of sampling as applied to scientific data (2d). ● Use a scatter diagram to identify a correlation between two variables (2g).	in light of new experiences and interaction with others. Know when to modify their knowledge, understanding and ideas based on their critical reflection. Seek new challenges and situations. ACP Linking: Abstraction – Evaluate a range of ideas, issues, problems or events, develop and combine them and apply them to complex imagined or theoretical situations. Meta-thinking: Intellectual confidence – synthesise a wide range of viewpoints and evidence to make a coherent and compelling personal argument.	
--	--	---	--	---	--	--

	9.7B Explain how some energy is transferred to less useful forms at each trophic level and that this affects the number of organisms at each trophic level, limits the length of a food chain and determines the shape of a pyramid of biomass in an ecosystem 9.8B Calculate the efficiency of energy transfers between trophic levels and percentage calculations of biomass 1a, 1b, 1c 2c 4a 9.9 Explain the positive and negative human interactions within ecosystems and their impacts on biodiversity, including: a fish farming b introduction of non-			● Calculate the percentage of mass (1c). ● Use fractions and percentages (1c). ● Calculate arithmetic means (2b). ● Calculate the rate changes in the decay of biological material (1c). ● Extract and interpret information from charts, graphs and tables (2c, 4a).		
--	---	--	--	---	--	--

	indigenous species c eutrophication 2c, 2g 4a, 4c 9.10 Explain the benefits of maintaining local and global biodiversity, including the conservation of animal species and the impact of reforestation 9.11B Describe the biological factors affecting levels of food security, including: a increasing human population b increasing animal farming and the increased meat and fish consumption c the impact of new pests and pathogens d environmental change caused by human activity e sustainability issues, e.g. use of land for					
--	---	--	--	--	--	--

	biofuel production and the cost of agricultural inputs 2c 4a, 4c 9.12 Describe how different materials cycle through the abiotic and biotic components of an ecosystem 9.13 Explain the importance of the carbon cycle, including the processes involved and the role of microorganisms as decomposers 9.14 Explain the importance of the water cycle, including the processes involved and the production of potable water in areas of drought including desalination 9.15 Explain how nitrates are made					
--	--	--	--	--	--	--

	available for plant uptake, including the use of fertilisers, crop rotation and the role of bacteria in the nitrogen cycle 9.16B Evaluate the use of indicator species as evidence to assess the level of pollution, including: a polluted water – bloodworm, sludgeworm b clean water – freshwater shrimps, stonefly c air quality – different species of lichen, blackspot fungus on roses 2c, 2g 4a, 4c 9.17B Explain the effects of temperature, water content and oxygen availability on the rate of decomposition in food preservation 9.18B Explain the effects of temperature, water content and oxygen					
--	---	--	--	--	--	--

	availability on the rate of decomposition in composting 2c 4a, 4c 9.19B Calculate rate changes in the decay of biological material 1c 2c, 2f 4a, 4c					
Revision of the GCSE Course	Students will engage in structured revision lessons, which will prepare them for the GCSE and where they will revisit challenging content to help them to fill knowledge/understanding gaps. The data gained using quizzing software will help us to adapt these revision sessions. Students will also have an opportunity to practice a number of past exam questions.	This is an example of how the 12 week plan will look, but the actual 12 week plan will be adapted based on the needs of our students: 1. Core practical revision 2. Core practical revision 3. Revision of identified challenging content 4. Revision of identified challenging content	Additional PPE Past Paper 2 to assess progress from the February PPE.	Use of mathematics • Percentage change calculations • Percentage of a total • Using standard form in calculations • Changing the subject of in an equation	VAA Hard Working: Practice – self-regulate and revise practice schedules in line with improvements. Set own goals and monitor progress towards them. Actively seek out ways to improve. ACP Realising – Automaticity Effortlessly use key facts, concepts and ideas relevant to the stage of learning. Draw upon a range of skills without the need to think or process.	Homework: more focussed exam questions on specific areas to help students prepare for the actual exams.

		5. Walk and talk past exam papers 6. Walk and talk past exam papers 7. Further exam practice 8. Further exam practice 9. Further time to address learning gaps identified in the structured revision sessions. 10. Further time to address learning gaps identified in		• Calculating a mean • Changing SI units in calculations • Making measurements precisely • Revision of key calculations in Biology Working scientifically skills • How to answer devise exam questions and be able to link this to specific		
--	--	--	--	--	--	--

		the structured revision sessions. 11. Revision and practice of key maths skills. 12. Revision and practice of working scientifically skills.		core practicals. • Be able to identify the independent, dependent and control variables in investigations. • Be able to give specific investigation improvements in exam answers. • Be able to draw apparatus • Answer questions		
--	--	---	--	--	--	--

				about core practicals when the context of the practical is changed. • Be able to critically analyse investigat ion data and make comparis on between data.		
--	--	--	--	---	--	--