

## KS4 Biology Curriculum



| <b>Year 10: Biology</b>                          |  |  |  |  |
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|  | B2:Scaling Up<br>Challenges of size (Triple<br>and Combined)   | B3: Organism System<br>Levels (Triple and<br>Combined)   | B4: Community Level<br>Systems (Triple and<br>Combined)  | B5: Genes, Inheritance<br>and Selection.<br>Inheritance Section<br>(Triple and Combined)   |
|  | Autumn 1   | Autumn 2 and Spring 1  | Spring 2 and Summer 1  | Summer 1 and 2   |
| <b>Content:</b> What will students know          | Students will understand the importance of transport systems in multicellular organisms. They will know the structure and function of the respiratory and circulatory system in humans including the lungs, blood vessels, the heart and composition of the blood. They will understand the structure of the leaf and how it is adapted for photosynthesis, and the importance of transpiration and translocation in plants. | Students will understand how the nervous and endocrine systems work with key examples. How internal environments are maintained including examples of homeostasis such as glucose control. Human reproduction, contraception and IVF are studied here. Triple students will study the eye and eyesight correction and the structure and function of the kidney in osmoregulation in addition to the above. | Students will understand how materials are cycled between the environment and living things. The role of bacteria in the cycling of nutrients including decomposition is included. How interdependence factors on population size and different types of feeding relationships are covered here. The different types of competition are identified with examples. Triple students will study the role of food webs, pyramids of biomass and energy efficiency calculations in addition to the above. | Students will look at genetics, genomes and DNA. They will know how characteristics are inherited from one generation to the next and the production of gametes. In addition triple students will learn about the work of Mendel, sexual and asexual reproduction. |
| <b>Skills:</b> What will students be able to do. | Using a microscope to study blood vessels, blood components and leaf structures. Use dissection techniques to view the heart and lungs. Plan and carry out   | Explain how a reflex arc works and how actions are coordinated. Explain the ideas of homeostasis using specific examples of negative feedback e.g. thyroxine, insulin and  | Students will be able to relate familiar processes such as respiration and photosynthesis to the cycling of nutrients and will identify parts of the carbon, water and   | Students will be able to use genetic diagrams in order to make predictions about the likelihood of offspring displaying certain characteristics. They will be  |



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|   | investigations into rates of transpiration. Opportunities to improve exam techniques are introduced here.  | glucagon hormones. They will be able to evaluate advantages and disadvantages of type of contraception using data.  | nitrogen cycle using a variety of diagrams. They will be able to categorise factors that affect living things as biotic or abiotic factors and recognise the different type of feeding relationship.   | able to identify the genotypes of individuals using pedigree diagrams. They will be able to explain the steps of meiosis and how meiosis increases variation. Triple students will be able to compare and contrast sexual and asexual reproduction.                   |
| <b>Other:</b> Literacy/ Numeracy/ Ethos | <p><b>Literacy:</b> Students will be able to define and use key terminology effectively.</p> <p><b>Numeracy:</b> Students will be able to calculate surface area, volumes and surface area to volume ratios. Interpretation of graphs and tables. Calculation of rates using potometers.</p> <p><b>Ethos:</b> To understand the need for transport systems in multicellular organisms and be able to relate the systems of gas exchange and transport in animals and plants to ideas about surface area to volume ratio.</p> | <p><b>Literacy:</b> Students will be able to define and use key terminology effectively</p> <p><b>Numeracy:</b> Using graphical data to recognise and interpret trends, or look at effectiveness of different contraceptives. To identify the pattern of hormones present throughout the menstrual cycle using graphs.</p> <p><b>Ethos:</b> To understand how organ systems work together to maintain homeostasis and coordinate responses to external factors.</p> | <p><b>Literacy:</b> Students will be able to define and use key terminology effectively.</p> <p><b>Numeracy:</b> Interpreting predator prey graphs, efficiency calculations.</p> <p><b>Ethos:</b> Linking together and building on ideas from year 8 and 9 on photosynthesis, food chains and respiration and linking this to their own experience and observation of the world around them.</p> | <p><b>Literacy:</b> Students will be able to define and use key terminology effectively.</p> <p><b>Numeracy:</b> Calculating percentages, probability and ratios</p> <p><b>Ethos:</b> Linking together understanding the building blocks of DNA with inheritance.</p> |
| <b>Assessment</b>                       | End of topic assessment on B2 with formative assessment using Educake.   | End of topic assessment on B3 with formative assessment using Educake.  | End of topic assessment on B4 with formative assessment using Educake.   | This is usually not assessed until year 11 as Year 10 Mocks will be carried out in this half term.  |

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| <b>Year 11: Biology</b>                          |  |   |   |   |
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|  | B5 Genes, Inheritance and Selection. Evolution (Triple and Combined)   | B6: Global Challenges Health (Triple and Combined)  | B6: Global Challenges Environment and Food Security (Triple and Combined)   | Revision and Exam Preparation   |
|  | Autumn 1   | Autumn 2 and Spring 1   | Spring 1 and 2  | Summer 1  |
| <b>Content:</b> What will students know          | Students will explore ideas about evolution and natural selection and the evidence. They will also learn about classification and extinction. Triple students will examine the work of Darwin and Wallace in more detail and discuss speciation. | Students will learn about different pathogens that may cause disease in animals and plants and how to defend against them. They will learn about how new drugs are made and modern technologies such as stem cell therapy, monoclonal antibodies and gene technology. | Students will learn about the negative and positive human impacts on the environment. They find out about the ways in which food security can be increased – such as selective breeding and genetic modification. Triple students will go into this topic in greater depth. | Students will be reviewing PAGs, content and practising exam questions to improve their exam technique. |
| <b>Skills:</b> What will students be able to do. | Students will be able to state several sources of scientific evidence for natural selection. They will be able to discuss ideas around extinction.   | Students will be able to identify specific examples of both communicable and non-communicable diseases. They will investigate microbiological techniques in the lab.  | Students will be able to sample from the environment and evaluate human impacts on the planet. They will be able to explain advantages and disadvantages of food security methods.  | Answer a wide range of question styles in exam conditions.  |
| <b>Other:</b> Literacy/ Numeracy/ Ethos          | <b>Literacy:</b> Students will be able to define and use key terminology effectively.  | <b>Literacy:</b> Students will be able to define and use key terminology effectively  | <b>Literacy:</b> Students will be able to define and use key terminology effectively.   | <b>Literacy:</b> Students will be able to define and use key terminology effectively.                   |



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|                   | <p><b>Numeracy:</b> Interpretation of graphs and tables.</p> <p><b>Ethos:</b> To understand how theories have changed over time and in the light of new evidence are still changing.</p> | <p><b>Numeracy:</b> Using graphical data to recognise and interpret trends and form links between cause and effect.</p> <p><b>Ethos:</b> To gain an understanding of disease and the current treatment options available for certain diseases.</p> | <p><b>Numeracy:</b> Sampling and data analysis.</p> <p><b>Ethos:</b> Linking together own experience and observation of the world around them with current events.</p> | <p><b>Numeracy:</b> Calculating percentages, probability and ratios</p> <p><b>Ethos:</b> Linking together understanding the building blocks of DNA with inheritance.</p> |
| <b>Assessment</b> | End of topic assessment on B5 with formative assessment using Educake and exam questions.  | End of topic assessment on B6 Health with formative assessment using Educake and exam questions.   | End of topic assessment on B6 Monitoring the Environment and B6 Feeding the human race with formative assessment exam questions.                                       | GCSE exams   |