

### Curriculum Map: Year 12 Biology Summer Term

| Summer  |   |  |
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|   | Teacher 1   | Teacher 2  |
| <p><b>Content</b><br/>Declarative knowledge<br/>'I Know'</p>      | <p><b>Module 3: Exchange and Transport</b><br/> <b>3.1.3 Transport in plants</b><br/>                     Know the need for transport systems in multicellular plants.<br/>                     Know the structure and function of the vascular system in the roots, stems and leaves of herbaceous dicotyledon plants.<br/>                     Know the process of transpiration and environmental factors that affect transpiration rate.<br/>                     Know the transport of water into the plant, through the plant and to the air surrounding the leaves.<br/>                     Know the adaptations of plants to the availability of water in their environment.<br/>                     Know the mechanism of translocation.</p> <p><b>Module 6: Genetics and Evolution</b><br/> <b>6.3.1 Ecosystems</b><br/>                     Know that ecosystems, which range in size, are dynamic and are influenced by both biotic and abiotic factors.<br/>                     Know that biomass transfers through ecosystems.<br/>                     Know about recycling within ecosystems.<br/>                     Know the process of primary succession in the development of an ecosystem.<br/>                     Know the use of sampling and recording methods to determine the distribution and abundance of organisms in a variety of ecosystems.</p> | <p><b>Module 4: Biodiversity, Evolution and Disease</b><br/> <b>4.2.1 Biodiversity</b><br/>                     Know how biodiversity may be considered at different levels.<br/>                     Know the factors affecting biodiversity.<br/>                     Know the ecological, economic and aesthetic reasons for maintaining biodiversity.<br/>                     Know the international and local conservation agreements made to protect species and habitats.</p> <p><b>Module 6: Genetics and Evolution</b><br/> <b>6.3.2 Populations and sustainability</b><br/>                     Know the factors that determine size of a population.<br/>                     Know the interactions between populations.<br/>                     Know the reasons for, and differences between, conservation and preservation.<br/>                     Know the management of environmental resources and the effects of human activities.</p>   |
| <p><b>Skills</b><br/>Procedural Knowledge<br/>'I know how to'</p> | <p><b>PAG 2.2: Dissection of the stem</b><br/>                     Know how to safely and correctly use a range of practical equipment and materials.<br/>                     Know how to keep appropriate records of experimental activities.<br/>                     Know how to present information and data in a scientific way.<br/>                     Know how to use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification.<br/>                     Know how to examine and draw stained sections of plant tissue to show the distribution of xylem and phloem.<br/>                     Know how to produce scientific drawings from observations with annotations.<br/>                     Know how to safely use instruments for dissection of an animal and plant organ.<br/>                     Know how to carry out practical investigations to estimate transpiration rates.<br/>                     Know how the distribution and abundance of organisms in an ecosystem can be measured.</p>   | <p><b>PAG 3.1: The calculation of species diversity.</b><br/>                     Know how to safely and correctly use a range of practical equipment and materials.<br/>                     Know how to keep appropriate records of experimental activities.<br/>                     Know how to present information and data in a scientific way.<br/>                     Know how to use a wide range of experimental and practical instruments, equipment and techniques appropriate to the knowledge and understanding included in the specification.<br/>                     Know how to produce scientific drawings from observations with annotations.<br/>                     Know how sampling is used in measuring the biodiversity of a habitat and the importance of sampling.<br/>                     Know how to carry out practical investigations collecting random and non-random samples in the field.<br/>                     Know how to measure species richness and species evenness in a habitat.<br/>                     Know how to use and interpret the Simpson's Index of Diversity to calculate the biodiversity of a habitat.<br/>                     Know how genetic biodiversity may be assessed, including calculations.</p> |

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|  |  | Know how the management of an ecosystem, can provide resources in a sustainable way.  |
| <b>Strategies</b><br>Conditional Knowledge<br>'I know when to' | Use theories, models and ideas to develop scientific explanations.<br>Use knowledge and understanding to pose scientific questions, define scientific problems, present scientific arguments and scientific ideas.   | Understand why biodiversity must be maintained and how conservation can be achieved on a local, national and global scale.  |
| Key Questions  | <p>Why do plants need transport systems?</p> <p>What is the structure and function of the vascular system in plants?</p> <p>What is transpiration and what are the factors that affect its rate?</p> <p>How are plants adapted to the availability of water in their environment?</p> <p>What is translocation?</p> <p>How are ecosystems influenced by abiotic and biotic factors?</p> <p>How is biomass transferred through ecosystems?</p> <p>How are materials recycled in ecosystems?</p> <p>What is the process of primary succession?</p>   | <p>How is biodiversity considered at different levels and what factors affect it?</p> <p>What are the reasons for maintaining biodiversity?</p> <p>What conservation agreements are made to protect species and habitats?</p> <p>What factors determine the size of a population?</p> <p>What is the difference between conservation and preservation?</p> <p>What are the effects of human activities on the environment and how can these impacts be managed?</p> |
| Assessment topics  | PPE: Modules 2,3 and 4 (2 hours and 15 minutes) in June.   |   |
| Cross curricular links/Character Education                     | <p><b>Geography:</b> recycling of nutrients in ecosystems, conservation and human impact on the environment.</p> <p><b>Maths:</b> recognise and make use of appropriate units in calculations, recognise and use expressions in decimal and standard form, use ratios, fractions and percentages, estimate results, use calculators to find and use power, exponential and logarithmic functions, use an appropriate number of significant figures, construct and interpret frequency tables and diagrams, bar charts and histograms, understand simple probability, understand the principles of sampling as applied to scientific data, understand the terms mean, median and mode, use a scatter diagram to identify a correlation between two variables, select and use a statistical test, understand measures of dispersion, including standard deviation and range, use logarithms in relation to quantities that range over several orders of magnitude, translate information between graphical, numerical and algebraic forms, plot two variables from experimental or other data.</p> <p><b>Character education:</b> Human impact on the environment and how conservation help to mitigate the impact of humans on the environment.</p> |   |