

KS4 and KS5 Biology Long term planning grid

	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Year 11</b>	<p><b>ECOLOGY</b></p> <p><b>What will be learnt?</b> L1 Communities, L2-L3, Required practical: Sampling, L4-5 Adaptations of animals, L6 Competition, L7Communities, L8 The Water Cycle, L9 The Carbon Cycle, L10 Decomposition, L11 Required prac: Decomposition,</p> <p><b><u>Main outcome:</u></b> The Sun is a source of energy that passes through ecosystems. Materials including carbon and water are continually recycled by the living world, being released through respiration of animals, plants and decomposing microorganisms and taken up by plants in photosynthesis. All species live in ecosystems composed of complex communities of animals</p>	<p><b>ECOLOGY</b></p> <p><b>What will be learnt?</b> L12 and L13 Biodiversity, L14 Loss of biodiversity, L15 Global Warming, L16 Increasing Biodiversity, L17 Trophic levels and biomass, L18 Food security, L19 Sustainable food production</p> <p><b><u>Main outcome:</u></b> The Sun is a source of energy that passes through ecosystems. Materials including carbon and water are continually recycled by the living world, being released through respiration of animals, plants and decomposing microorganisms and taken up by plants in photosynthesis. All species live in ecosystems composed of complex communities of animals and plants dependent on each other and that are adapted to particular</p>	<p><b>INHERITANCE VARIATION AND EVOLUTION</b></p> <p><b>What will be learnt?</b> L1 Sexual and Asexual Reproduction, L2 Meiosis and Mitosis, L3 Advantages and Disadvantages of sexual reproduction, L4 DNA and the genome, L5 DNA structure, L6 Protein synthesis, L7 Inheritance, L8 Inherited disorders, L9 Sex Determination. The rest of the module is to be completed next half term.</p> <p><b><u>Main outcome:</u></b> Discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal</p>	<p><b>INHERITANCE VARIATION AND EVOLUTION CONTINUED</b></p> <p><b>What will be learnt?</b> L12 Variation, L13 Evolution and Extinction, L14 Required prac Effect of antibiotics on bacteria L15 Selective breeding, L16 Genetic engineering, L17 Cloning, L18 Theory of evolution, L19 Speciation, L20 Understanding of genetics, L21 Evidence for evolution, L22 Carl Linnaeus and the history of classification, L23 Modern Classification and Evolutionary trees</p> <p><b><u>Main outcome:</u></b> Discover how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene</p>	<p><b>REVISION/RETRIEVAL OF PREVIOUS MODULES, AND REQUIRED PRACTICAL PRACTICE</b></p>	

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	<p>and plants dependent on each other and that are adapted to particular conditions, both abiotic and biotic. These ecosystems provide essential services that support human life and continued development. In order to continue to benefit from these services humans need to engage with the environment in a sustainable way. In this section we will explore how humans are threatening biodiversity as well as the natural systems that support it. We will also consider some actions we need to take to ensure our future health, prosperity and well-being.</p> <p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of</li> </ul>	<p>conditions, both abiotic and biotic. These ecosystems provide essential services that support human life and continued development. In order to continue to benefit from these services humans need to engage with the environment in a sustainable way. In this section we will explore how humans are threatening biodiversity as well as the natural systems that support it. We will also consider some actions we need to take to ensure our future health, prosperity and well-being.</p> <p><b><u>Skills developed:</u></b> Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> <li>• Use of appropriate</li> </ul>	<p>or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. Explore how an understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Scientists have now discovered how to take genes from</p>	<p>mutations occur continuously and on rare occasions can affect the functioning of the animal or plant. These mutations may be damaging and lead to a number of genetic disorders or death. Very rarely a new mutation can be beneficial and consequently, lead to increased fitness in the individual. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. Explore how an understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Once new varieties of plants or animals have been produced it is possible to clone individuals to produce larger numbers of identical individuals all</p>		
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	<p>measurements accurately</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes.</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Measurement of rates of reaction by a variety of methods</li> <li>• Application of appropriate sampling techniques to investigate the distribution and abundance of organisms in an ecosystem via</li> </ul>	<p>apparatus and techniques for the observation and measurement of biological changes and/or processes.</p> <ul style="list-style-type: none"> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> <li>• Measurement of rates of reaction by a variety of methods</li> <li>• Application of appropriate sampling techniques to investigate the distribution and abundance of organisms in an ecosystem via direct use in the field</li> </ul> <p>Mathematical skills:</p>	<p>one species and introduce them into the genome of another by a process called genetic engineering. We will explore the controversy related to genetic modification.</p> <p><b><u>Skills developed:</u></b></p> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate techniques and qualitative reagents to identify biological molecules and processes in more complex and problem-solving contexts including continuous sampling in an investigation</li> <li>• Use of appropriate apparatus to make and record a range of measurements accurately</li> </ul>	<p>carrying the favourable characteristic. Scientists have now discovered how to take genes from one species and introduce them into the genome of another by a process called genetic engineering. We will explore the controversy related to genetic modification.</p> <p><b><u>Skills developed:</u></b></p> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>• Use of appropriate techniques and qualitative reagents to identify biological molecules and processes in more complex and problem-solving contexts including continuous sampling in an investigation</li> <li>• Use of appropriate apparatus to</li> </ul>		
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	<p>direct use in the field</p> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Use ratios, fractions and percentages</li> <li>• Find arithmetic means</li> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Understand the terms mean, mode and median</li> <li>• Translate information between graphical and numeric form</li> <li>• Plot two variables from experimental or other data</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Use ratios, fractions and percentages</li> <li>• Find arithmetic means</li> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Understand the terms mean, mode and median</li> <li>• Translate information between graphical and numeric form</li> <li>• Plot two variables from experimental or other data</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> </ul> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Use ratios, fractions and percentages</li> <li>• Construct and interpret frequency tables and diagrams, bar charts and histograms</li> <li>• Understand simple probability</li> </ul>	<p>make and record a range of measurements accurately</p> <ul style="list-style-type: none"> <li>• Use of appropriate apparatus and techniques for the observation and measurement of biological changes and/or processes</li> <li>• Safe and ethical use of living organisms (plants or animals) to measure physiological functions and responses to the environment</li> </ul> <p>Mathematical skills:</p> <ul style="list-style-type: none"> <li>• Use ratios, fractions and percentages</li> <li>• Construct and interpret frequency tables and diagrams,</li> </ul>		
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	<ul style="list-style-type: none"> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	<ul style="list-style-type: none"> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and use the symbols: =, &lt;&gt;, &gt;, <math>\alpha</math>, ~</li> <li>• Translate information between graphical and numeric form</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>	<p>bar charts and histograms</p> <ul style="list-style-type: none"> <li>• Understand simple probability</li> <li>• Understand and use the symbols: =, &lt;&gt;, &gt;, <math>\alpha</math>, ~</li> <li>• Translate information between graphical and numeric form</li> </ul> <p><b><u>How will learning be assessed?</u></b></p> <ul style="list-style-type: none"> <li>• Half term assessment</li> <li>• Required practical assessment</li> <li>• Homework booklets of past exam questions</li> </ul>		
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