



# Curriculum Map

Subject: Biology

Year group: 10 & 11

Timings are broad as classes vary depending on how many teachers the class has.

The colours denote: **Higher tier only content**

**Separate science only content**

Time period	Topic 3 Year 10 (Autumn Term)	Topic 4 Year 10 (Spring Term)	Topic 5 Year 10 (Summer Term)	Topic 6 Year 11 (Autumn Term)	Topic 7 Year 11 (Spring Term)
<b>Content</b>  <i>Declarative Knowledge – 'Know What'</i>	<u>Biology 2 Organisation part 2</u> -The structure and function of the heart, blood vessels and blood -The causes and treatments of coronary heart disease  <u>Biology 4- Bioenergetics</u> -Structure and function of plant tissues and organs, including xylem and phloem -Photosynthesis & factors that affect the rate of photosynthesis -Aerobic respiration -Anaerobic respiration -Fermentation -Response to exercise -Metabolism	<u>Biology 3- Infection &amp; Response</u> -Health and the effects of lifestyle on non-communicable diseases -Communicable diseases: how viral, bacterial, fungal and protist diseases are spread, with specific examples of named diseases, their symptoms and treatment. -Human defence systems: non specific defence and the role of white blood cells against pathogens -Vaccination and its role in the prevention of illness -Antibiotics and painkillers: An understanding of the use of antibiotics and why they won't kill viruses -Discovery and development of drugs: Sources of drugs and	<u>Biology 7 - Ecology</u> -Adaptations, interdependence and competition -Organisation of an ecosystem -How materials are cycled -Biodiversity and the effect of human interaction on ecosystems -Waste management -Land use -Deforestation -Global warming -Maintaining biodiversity	<u>Biology 5 - Homeostasis &amp; response</u> -Homeostasis and the conditions that must be maintained -Structure and function of the nervous system <b>-Structure and functions of the brain</b> <b>-Imaging techniques to identify brain function and disorders</b> <b>-Structure and function of the eye</b> <b>-Accommodation and eyesight problems</b> <b>-Control of body temperature</b> -Structure and function of the human endocrine system -Control of blood glucose concentration <b>-Maintaining water and nitrogen balance in the body</b> -Hormones in human reproduction -Contraception <b>-Uses of hormones to treat infertility</b> <b>-Negative feedback</b>	<u>Biology 6 - Inheritance, Variation &amp; Evolution</u> -Sexual and asexual reproduction <b>-Advantages and disadvantages of sexual and asexual reproduction</b> -Meiosis -DNA and the genome <b>-DNA Structure</b> -Genetic Inheritance -Inherited disorders -Sex determination -Variation -Evolution -Selective breeding -Genetic engineering <b>-Cloning</b> <b>-Theory of evolution</b> <b>-Speciation</b> <b>-The understanding of genetics</b> -Evidence for evolution -Fossils -Extinction -Antibiotic resistant bacteria -Classification of living organisms



# Curriculum Map

		<p>how clinical trials are conducted to test for toxicity, efficacy and dose.</p> <p>-Monoclonal antibodies: Production using mice lymphocytes and tumour cells and uses of monoclonal antibodies for diagnosis. research and treatment of disease.</p> <p>-Plant diseases: identification of diseases caused by viruses, bacteria, fungi and insects as well as mineral ion deficiencies</p> <p>-Plant defence mechanisms: physical, chemical and mechanical responses</p>		<p>-Control and coordination of plant hormones and their uses in agriculture and horticulture</p>	
<p><b>Skills</b></p> <p><i>Procedural Knowledge – 'Know How'</i></p>	<p>-Use scientific theories and explanations to develop hypotheses on how light intensity affects the rate of photosynthesis.</p> <p>-Plan experiments to test hypotheses.</p> <p>- Recognise the need for multiple repeats</p> <p>- Make and record observations</p> <p>- Translate numeric data into graphical form.</p> <p>-Understand and use inverse proportion: the inverse square law and light intensity in the context of photosynthesis.</p>	<p>-Evaluate medical treatments.</p> <p>-Consider ethical issues relating to biology topics.</p> <p>-Extract and interpret information from charts, graphs and tables</p> <p>- Use appropriate apparatus to record length and area.</p> <p>-Use appropriate apparatus and techniques to observe and measure the process of bacterial growth.</p> <p>-Safe and ethical use of bacteria</p> <p>-Use of appropriate techniques and qualitative reagents in</p>	<p><b>Evaluation</b></p> <p>-Extract and interpret information from charts, graphs and tables.</p> <p>-Evaluate the environmental implications of human choices.</p> <p><b>Practical experiments</b></p> <p>1. Use sampling techniques to investigate the effect of a factor on the distribution of this species. Record first hand observations of organisms.</p>	<p>-Use appropriate apparatus to record time.</p> <p>-Selecting appropriate apparatus and techniques to measure the process of reaction time.</p> <p>-Safe and ethical use of humans to measure physiological function of reaction time and responses to a chosen factor.</p> <p>-Translate information between numerical and graphical forms.</p> <p>-Use appropriate apparatus to record length and time.</p> <p>- Selecting appropriate apparatus and techniques to measure</p>	<p>-Consider ethical issues relating to biology topics and medical treatments.</p> <p>-Extract and interpret information from charts, graphs and tables</p> <p>-Understand how scientific methods and theories develop over time</p>



# Curriculum Map

		<p>problem-solving contexts.</p> <ul style="list-style-type: none"> <li>-Develop hypotheses</li> <li>-Plan experiments to make observations, test hypotheses and explore phenomena.</li> </ul>		<p>the growth of shoots or roots.</p> <ul style="list-style-type: none"> <li>-Safe and ethical use of plants to measure physiological function of growth in response to light or gravity.</li> <li>-Observations of biological specimens to produce labelled scientific drawings.</li> <li>-Plan experiments to make observations to explore the phenomena of plant responses.</li> <li>-Apply knowledge of a range of techniques, apparatus and materials appropriate to the experiment.</li> <li>-Make and record observations and measurements using length and biological drawings.</li> <li>-Suggest improvements and further investigations.</li> <li>-Present observations as tables, graphs or drawings.</li> </ul>	
<p><b>Key Questions</b></p>	<ul style="list-style-type: none"> <li>-How does the heart work?</li> <li>-Why are plants green?</li> <li>-How can we maximise yields of crops?</li> <li>-How is energy released from glucose?</li> <li>-What effect does exercise have on the body?</li> </ul>	<ul style="list-style-type: none"> <li>-What is health and how does lifestyle affect health?</li> <li>-What is a pathogen?</li> <li>- What are the different types of pathogen?</li> <li>- How does your body protect you from disease?</li> <li>- How do vaccinations work?</li> <li>-Should we all be vaccinated?</li> </ul>	<ol style="list-style-type: none"> <li>1.what are adaptations?</li> <li>2.what are the key parts of an ecosystem and how do they interact?</li> <li>3.How are populations affecting biodiversity?</li> <li>4.How are materials like water, carbon and nitrogen cycled?</li> </ol>	<ul style="list-style-type: none"> <li>-How does the human body maintain internal conditions?</li> <li>-How do humans respond to external stimuli?</li> <li>-How do humans thermoregulate?</li> <li>-How do hormones coordinate the menstrual cycle?</li> </ul>	<ul style="list-style-type: none"> <li>-How are mitosis and meiosis different?</li> <li>-What is DNA and how does it give us different characteristics that we inherit from our parents?</li> <li>-What is natural selection?</li> <li>-What is the evidence for evolution?</li> <li>-What is the fossil record?</li> </ul>



# Curriculum Map

		<ul style="list-style-type: none"> <li>- What processes must drugs go through before they are deemed safe to use?</li> <li>- What are monoclonal antibodies and how can they be used for medical treatments?</li> </ul>		<ul style="list-style-type: none"> <li>-How can hormones be used to treat fertility issues?</li> <li>-What is osmoregulation?</li> <li>-How do plants respond to external stimuli?</li> </ul>	<ul style="list-style-type: none"> <li>-What is extinction and what might cause it?</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>-Required Practical Assessed Exam Questions</li> <li>-Assessed Exam Question</li> <li>-End of Topic Test</li> </ul>		<ul style="list-style-type: none"> <li>1.Required practical 7 - Using sampling techniques to measure a population assessed questions</li> <li>2.End of topic test</li> </ul>	<ul style="list-style-type: none"> <li>-Mid Topic Test</li> <li>-Required Practical Assessed Exam Questions (Reaction Times and <b>Plant responses</b> )</li> <li>-End of Topic Test</li> </ul>	<ul style="list-style-type: none"> <li>-Assessed Exam Questions</li> <li>-Mid-topic test</li> <li>-End of topic test</li> </ul>
<b>Literacy/ Numeracy/ SMSC/Character</b>	<p><b>Literacy</b></p> <ul style="list-style-type: none"> <li>-Appropriate use of tier three vocabulary.</li> <li>-Develop extended answers through practice of 6 mark questions.</li> <li>-Plan experiments or devise procedures to make observations</li> <li>-Development of comprehension skills through research using a variety of sources.</li> </ul> <p><b>Numeracy</b></p> <ul style="list-style-type: none"> <li>-Calculating means</li> <li>-Calculating rates</li> <li>-Translating numerical data into graphical forms</li> </ul> <p><b>SMSC</b></p> <ul style="list-style-type: none"> <li>-Safe and ethical use of humans and living organisms in scientific investigations</li> </ul> <p><b>Character</b></p> <ul style="list-style-type: none"> <li>-<b>Confidence</b> - Building confidence in practical skills with the</li> </ul>		<p><b>Literacy;</b></p> <ul style="list-style-type: none"> <li>use of third tier terminology</li> </ul> <p><b>Numeracy;</b></p> <ul style="list-style-type: none"> <li>Calculate the efficiency of biomass transfer between trophic levels.</li> </ul> <p><b>SMSC;</b></p> <ul style="list-style-type: none"> <li>Group discussion - Is deforestation destroying our ecosystems?</li> </ul> <p><b>Character;</b> Tolerance - aware of opinion in group discussion and to tolerate others ideas and opinions.</p>	<p><b>Literacy</b></p> <ul style="list-style-type: none"> <li>-Appropriate use of tier three vocabulary.</li> <li>-Develop extended answers through practice of 6 mark questions.</li> <li>-Plan experiments or devise procedures to make observations</li> <li>-Development of comprehension skills through research using a variety of sources.</li> </ul> <p><b>Numeracy</b></p> <ul style="list-style-type: none"> <li>-Calculating means</li> <li>-Translating numerical data into graphical forms</li> </ul> <p><b>SMSC</b></p> <ul style="list-style-type: none"> <li>-Safe and ethical use of humans and living organisms in scientific investigations</li> <li>-Discussion of ethical issues surrounding kidney transplants</li> <li>-Discussion of ethical issues surrounding</li> </ul>	<p><b>Literacy</b></p> <ul style="list-style-type: none"> <li>-Appropriate use of tier three vocabulary.</li> <li>-Develop extended answers through practice of 6 mark questions.</li> <li>-Development of comprehension skills through research using a variety of sources.</li> </ul> <p><b>Numeracy</b></p> <ul style="list-style-type: none"> <li>-Analysis of data linked to variation</li> <li>-Interpretations of punnet squares - ratios and percentages</li> </ul> <p><b>SMSC</b></p> <ul style="list-style-type: none"> <li>-Evaluating the use of genetic engineering and discussion of the ethical issues surrounding its use</li> <li>- Discussion surrounding which species conservation efforts should focus on</li> <li>- Evaluating the use of selective breeding and</li> </ul>



# Curriculum Map

	<p>completion of a required practical.</p> <p><b>-Resilience &amp; Initiative</b></p> <p>-Resolving difficulties in practical techniques</p>			<p>fertility treatments and IVF</p> <p><b>Character</b></p> <p><b>-Tolerance</b> - Showing tolerance towards others views considering fertility treatments</p> <p><b>-Confidence</b> - Building confidence in practical skills with the completion of two/<b>three</b> required practicals.</p> <p><b>-Resilience &amp; Initiative</b></p> <p>-Resolving difficulties in practical techniques</p>	<p>discussion of the ethical issue surrounding its use</p> <p>-Discussion surrounding scientific theories and religious beliefs</p> <p><b>Character</b></p> <p><b>-Tolerance</b> -Showing tolerance towards others views considering genetic engineering and selective breeding</p> <p><b>-Integrity</b></p> <p>-Demonstrating sensitivity when considering the effect of genetic disorders.</p>
--	--	--	--	---	--