

## KS5 Long Term Curriculum Plan: A LEVEL BIOLOGY Year 13 2021-2022

**Curriculum Aim:** In A Level Biology we extend on the knowledge of GCSE and aim to prepare, inspire and nurture a passion for Biology, whilst laying the groundwork for further study in courses like the biological sciences and medicine. We do this by covering a wide range of biological knowledge and essential practical skills. This includes preparing students to be analytic thinkers and problem solvers.

**Link to prior learning:** The subject builds on key knowledge and skills from Year 1 A Level Biology and GCSE, by diving deeper into key topics such as energy transfers in respiration and photosynthesis, organisms use of the nervous and endocrine system, in addition to the use of gene technology and expression.

**Rationale of sequencing:** We begin the course by focusing on essential knowledge of how organisms respond to change using the nervous and endocrine systems. Alongside this, students will gain an understanding of essential genetic inheritance. This knowledge together with the knowledge gained from Year 12 protein synthesis is then further embedded in the topics of gene technology and expression. New vocabulary and skills are learnt. Throughout all topics we practice essential practical skills. Topics link from one to another, we use continuous recall starters to embed content.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Nutrient cycles Response to Stimuli Inherited Change	Students will gain an understanding of: <ul style="list-style-type: none"> <li>● The movement of nutrients specifically nitrogen and phosphorus through ecosystems, and the effect fertilisers have on this.</li> <li>● Describe the processes involved in responding to stimuli both through nervous impulses and hormonal responses.</li> <li>● Explain and calculate the probability of inheriting particular characteristics. Analyse the statistical significance of variation using the chi-squared test.</li> </ul>	Students will be assessed approximately every 4 weeks using End of Unit exams on each topic.
Autumn 2		Students will develop key skills such as planning investigations, key scientific calculations and ability to manipulate formula and units.	
Spring 1	Response to Stimuli (continued) Homeostasis Populations and genetics	Students will gain knowledge on: <ul style="list-style-type: none"> <li>● Use the Hardy-Weinberg principle to calculate the probability of inheritance. Explain how selection pressures affect distribution.</li> <li>● Explain the mechanisms involved in controlling essential internal conditions such as temperature and blood glucose levels.</li> </ul> Students will develop key skills such as interpreting information on negative and positive feedback and how to collect data about frequency of observable phenotypes.	1 x Year 1 Paper and 1 x Year 2 paper (on Year 2 content so far)  <b>Mock week (w/b 5<sup>th</sup> Jan 2022)</b>
Spring 2	Gene expression Photosynthesis	Students will gain knowledge of: <ul style="list-style-type: none"> <li>● The different types of stem cells and their uses in medicine. How transcription factors and siRNA affect transcription. Understanding of epigenetics and effects of acetylation and methylation of DNA and histones. How tumours arise and the purpose of the human genome project.</li> </ul> Students will develop key skills such as evaluating the use of stem cells, evaluate genetic data and evidence of correlations between genetic and environmental factors.	Students will be assessed approximately every 4 weeks using End of Unit exams on each topic.

Summer 1	Recombinant DNA (gene technology) Respiration Revision Exam Technique	Students will gain knowledge of: <ul style="list-style-type: none"> <li>● The process of respiration, in detail.</li> <li>● How gene technology is used to create recombinant DNA.</li> <li>● The uses of recombinant DNA in modern medicine.</li> </ul> Students will develop key skills such as the ability to evaluate the ethical, financial and social issues associated with the use and ownership of recombinant DNA technology in agriculture, in industry and in medicine. Carry out gel electrophoresis to produce fingerprints for food dyes. Students will: <ul style="list-style-type: none"> <li>● Focus skills such as how to write a scientific essay whilst incorporating knowledge from all topics on the A level course.</li> <li>● Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to make judgements and reach conclusions.</li> <li>● Continue to practice statistical analysis, mathematical skills such as calculating standard deviations.</li> </ul>	End of year in class mock examinations for all three papers.
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Further Information

The Course Specification <https://filestore.aqa.org.uk/resources/biology/specifications/AQA-7401-7402-SP-2015.PDF>

All topics will be assessed with an end of module exam (every 3-4 weeks). Practical skills will be assessed throughout the course during required practicals. Students are expected to complete 5 hours of additional study per week for this course.