

Introduction to A Level Biology A:

This specification allows teachers to adopt a flexible approach to the delivery of A Level Biology. The course has been designed to enable centres to deliver the content modules (Modules 2–6) using the framework provided, or to design a customised course. Practical work undertaken to support teaching of the content will serve to cover the requirements of the practical skills module (Module 1), which is assessed in the written examinations and through the Practical Endorsement. The specification is divided into topics, each containing different key concepts of biology. Throughout the specification, cross-references indicate the relevance of individual learning outcomes to the mathematical and practical criteria that are embedded in the assessments.

The aim of the A Level Biology course is:

OCR's A Level in Biology A specification aims to encourage learners to:

- develop essential knowledge and understanding of different areas of the subject and how they relate to each other
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- develop competence and confidence in a variety of practical, mathematical and problem solving skills
- develop their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject
- understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society (as exemplified in 'How Science Works' (HSW)).

Key features of this specification:

Our A Level in Biology A specification is designed with a content-led approach and provides a flexible way of teaching. The specification:

- retains and refreshes the popular topics from the legacy OCR Biology qualification (H421)
- is laid out clearly in a series of teaching modules with additional guidance added where required to clarify assessment requirements
- is co-teachable with the AS level
- embeds practical requirements within the teaching modules
- identifies Practical Endorsement requirements and how these can be integrated into teaching of content (see Section 5f)
- exemplifies the mathematical requirements of the course (see Section 5d)
- highlights opportunities for the introduction of key mathematical requirements (see Section 5d and the additional guidance column for each module) into your teaching
- identifies, within the Additional guidance column how the skills, knowledge and understanding of How Science Works (HSW) can be incorporated within teaching.

Timetable rationale:

The A Level Biology course is delivered by two Biology teachers over 5 hours of contact time per week (shared between the two teachers as 3 hours and 2 hours). The two teachers will follow different teaching orders to allow for greater continuity, delivery and support for the groups. The co-teaching approach provides students with a range of delivery approaches and provides a wide diversity of feedback and experiences from different staff. Both teachers are responsible for delivering the required practical activities and provide feedback in the students’ PAG books. Throughout the course there are regular summative and formative assessments, the formative assessments are recorded in a centralised tracking spreadsheet, with performance compared to students’ aspirational ALPS grades.

Overview of A Level in Biology A (H420):

Content Overview	Assessment Overview	
<p>Content is split into six teaching modules:</p> <ul style="list-style-type: none"> • Module 1 – Development of practical skills in biology • Module 2 – Foundations in biology • Module 3 – Exchange and transport • Module 4 – Biodiversity, evolution and disease • Module 5 – Communication, homeostasis and energy • Module 6 – Genetics, evolution and ecosystems <p>Component 01 assesses content from modules 1, 2, 3 and 5.</p> <p>Component 02 assesses content from modules 1, 2, 4 and 6.</p> <p>Component 03 assesses content from all modules (1 to 6).</p>	<p>Biological processes (01)</p> <p>100 marks</p> <p>2 hour 15 minutes written paper</p>	<p>37% of total A level</p>
	<p>Biological diversity (02)</p> <p>100 marks</p> <p>2 hour 15 minutes written paper</p>	<p>37% of total A level</p>
	<p>Unified biology (03)</p> <p>70 marks</p> <p>1 hour 30 minutes written paper</p>	<p>26% of total A level</p>
	<p>Practical Endorsement in biology (04) (non exam assessment)</p>	<p>Reported separately (see section 5f)</p>

All components include synoptic assessment.

Biology Delivery

Year	Topic	Term	Teacher	Content/rationale	Exam component
Module 1 – Development of Practical Skills in Biology					
12/13	1.1 Practical skills assessed in a written examination	N/A	A/B	Module 1 of the specification content relates to the practical skills learners are expected to gain throughout the course, which are assessed throughout the written examinations and also through the Practical Endorsement (see Section 5f). Practical activities are embedded within the learning outcomes of the course to encourage practical activities in the classroom which contribute to the achievement of the Practical Endorsement (Section 5f) as well as enhancing learners' understanding of biological theory and practical skills. Opportunities for carrying out activities that could count towards the Practical Endorsement are indicated throughout the specification. These are shown in the Additional guidance column as PAG1 to PAG11 (Practical Activity Group, see Section 5f). There are a wide variety of opportunities to assess PAG12 throughout the qualification.	01, 02, 03
12/13	1.2 Practical skills assessed in the practical endorsement	N/A			01, 02, 03
Module 2 - Foundations in Biology					
12	2.1.1 Cell structure	Autumn	A	Topic builds greatly from KS4 study and shows the linear progression of A Level Biology. Provides students with familiarity to the course and helps to bridge KS4 to KS5 transition effectively. This topic builds on the summer transition work set.	01, 02, 03
12	2.1.2 Biological molecules	Autumn	A	Key foundations that are delivered after the cell structure topic. Starts to develop Biochemistry links and is a challenge due to the volume of knowledge required. It is the basis of understanding for all other modules. Key processes and structures are covered that are fundamental to the rest of the course and biological processes.	01, 02, 03
12	2.1.3 Nucleotides and nucleic acids	Autumn/ Spring	A	Pulls together strands delivered from Cell structure and proteins topic of Biological molecules. It is the basis of the genetics work covered in module 6 in year 13.	01, 02, 03

12	2.1.4 Enzymes	Spring	A	Always taught once students are confident on protein structure as consequences of pH and temperature changes can be clearly understood and applied.	01, 02, 03
12	2.1.5 Biological membranes	Autumn	B	As students learn about cell structure, they appreciate that every organelle is surrounded by a membrane. The structure and function of the membrane is studied, along with a cross link to Biological molecules and phospholipids. Students build in knowledge of diffusion, osmosis and active transport from KS4 rapidly. This builds up the understanding needed to ensure that processes such as exchange surface in Module 3 and disease in module 4 are introduced.	01, 02, 03
12	2.1.6 Cell division, cell diversity and cellular organisation	Autumn	B	Once the structure of the cell has been explored to KS5 Level, link to semi-conservative replication from the nucleotide topic and structure of proteins topic, students then learn about cell and nuclear division. Covered before the work on genetics and variation in module 6 taught in year 13.	01, 02, 03
Module 3 - Exchange and Transport					
12	3.1.1 Exchange surfaces	Autumn	B	Taught after the membranes topic.	01, 03
12	3.1.2 Transport in animals	Autumn/ Spring	B	Taught after the cell specialisation topic and membranes topic. This topic builds upon these fundamentals of Biology.	01, 03
12	3.1.3 Transport in plants	Spring	B	Taught after the cell specialisation topic and membranes topic. This topic builds upon these fundamentals of Biology. Students find Animal Transport easier to grasp due to a general understanding of key terms. Plant transport builds upon this with new terminology.	01, 03
Module 4 – Biodiversity, Evolution and Disease					
12	4.1.1 Communicable diseases, disease prevention and the immune system	Spring	B	Following the work on proteins in biological molecules the detection of foreign pathogens is easier understood.	02, 03
12	4.2.1 Biodiversity	Spring/ Summer	B	This is taught in line with the Y12 field trip. Students develop an understanding of sampling and	02, 03

				statistics that they can apply to the Ecology field trip. This supports the sampling PAG.	
12	4.2.2 Classification and evolution	Spring	A	Requires a good understanding of cell division and nucleic acids and DNA structure so taught after that completed.	02, 03
Module 5 – Communication, Homeostasis and Energy					
13	5.1.1 Communication and homeostasis	Autumn	A	Need for communication systems and outline of homeostasis discussed. Range of examples and issues from a range of living organisms.	01, 03
13	5.1.2 Excretion as an example of homeostatic control	Autumn	A	Builds on the knowledge of biological molecules and the principles of homeostasis. Specific examples and key focus on the function and structure of liver and kidneys	01, 03
13	5.1.3 Neuronal communication	Autumn	A	Co-ordination mechanism taught after homeostasis, compared with hormonal communication and linked to specific examples from previous topic.	01, 03
13	5.1.4 Hormonal communication	Autumn	A	Co-ordination mechanism taught after homeostasis, compared with neuronal communication and linked to specific examples from previous topic.	01, 03
13	5.1.5 Plant and animal responses		B	Detection of chemicals by membrane receptors and cell signalling needs to understand here. The work on cells, membranes and processes such as diffusion need to be covered to fully grasp the processes covered.	01, 03
13	5.2.1 Photosynthesis	Autumn	A	Due to cognitive demand of the topic, this is always studied in Y13, and is taught in sequence with respiration due to the similarities in Biochemistry	01, 03
13	5.2.2 Respiration	Spring	A	Due to cognitive demand of the topic, this is always studied in Y13, and is taught in sequence with photosynthesis due to the similarities in Biochemistry	01, 03
Module 6 – Genetics, Evolution and ecosystems					
13	6.1.1 Cellular control		B	Follows on from the nucleotide topics in year 12 and the variation and evolution lesson. Biological molecules fundamental to whole unit.	02, 03
13	6.1.2 Patterns of inheritance		B	Variation and evolution taught first as this builds on the basis of variation and its advantages to species. It then covers the genetic mechanisms which requires Cellular control first.	02, 03

13	6.1.3 Manipulating genomes	Spring	B	Order with the first to as it follows from patterns and cellular modules units to how the DNA and genes can be manipulated and why.	02, 03
13	6.2.1 Cloning and biotechnology	Spring	B	This is taught towards the end of the course. Students need to understand plant and animal structure at a cellular level taught in Y12. The structure of microorganisms (e.g. bacteria and plasmids) taught in Y12. Students need to have an understanding of enzymes which is taught in Y12.	02, 03
12	6.3.1 Ecosystems	Summer	A	Taught at the end of year 12 as it follows up work completed at GCSE and builds on that work. Its teaching is accompanied by the field trip where the unit is brought to life with direct application.	02, 03
12	6.3.2 Populations and sustainability	Summer	B	Completed with ecosystems as the two run parallel and are interlinked.	02, 03

Enrichment activities

- Biology Olympiad
- Field trip
- Bioscience magazine subscription offered to students to purchase

Further curriculum support:

- www.kerboodle.com – online textbook
- Students are given the opportunity to purchase copies of the Oxford Kerboodle textbook and CGP resources.