



## KS5 Curriculum: Biology

### Curriculum Vision

The Vision for our Biology Students is to develop:

1. Good Biologists who have an interest and understanding of the living world around them.
2. Pupils who are able to work independently (and metacognitively).
3. Pupils who are able to take risks and be confident enough to tackle challenging tasks (linked to metacognition).
4. Pupils who are scientifically literate and confident with scientific language.
5. Students who have developed long term memory/ long term learning.
6. Students who are equipped with the knowledge and skills to move on the next stage of learning and or to careers or further education in sciences, engineering and medicine.

We Follow the OCR Biology A course (Code H420).

The course links well with the KS4 curriculum as starts with a similar initial organisation of lessons to those studied at GCSE.

This specification consists of 6 modules with 5 specifically taught and an under arching module on practical skills that is taught throughout the course.

The course is split between 2 teachers and so the curriculum profile below is split up as such.

### Curriculum Profile

#### Year 12

Autumn Term Teacher 1	Autumn Term Teacher 2
Module 2: Foundations in Biology	
<ul style="list-style-type: none"> <li>• Biological molecules               <ul style="list-style-type: none"> <li>○ Water</li> <li>○ Carbohydrates</li> <li>○ Proteins</li> <li>○ Lipids</li> <li>○ Nuclei acids</li> <li>○ Water and mineral ions</li> </ul> </li> <li>• DNA replication</li> </ul>	<ul style="list-style-type: none"> <li>• Cell structures and ultrastructure</li> <li>• Microscopy</li> <li>• Prokaryotes and eukaryotes</li> <li>• Cell membranes               <ul style="list-style-type: none"> <li>○ Transport across membranes</li> <li>○ Diffusion</li> <li>○ Osmosis</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>• Protein synthesis</li> <li>• Enzymes</li> </ul>	<ul style="list-style-type: none"> <li>○ Active transport</li> <li>• Cell cycle and nuclear division <ul style="list-style-type: none"> <li>○ Mitosis</li> <li>○ meiosis</li> </ul> </li> </ul>
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<b>Spring Term Teacher 1</b>	<b>Spring Term Teacher 2</b>
Module 3: Exchange and Transport	Module 4: Biodiversity Evolution and Disease
<ul style="list-style-type: none"> <li>• Exchange surfaces <ul style="list-style-type: none"> <li>○ Gas exchange in mammals</li> <li>○ Gas exchange in fish and insects</li> <li>○ Gas exchanges in plants</li> </ul> </li> <li>• Transport in animals <ul style="list-style-type: none"> <li>○ Types of circulatory systems</li> <li>○ Heart structure</li> <li>○ Cardiac cycle and coordination</li> <li>○ Transport of respiratory gases</li> </ul> </li> <li>• Transport in plants <ul style="list-style-type: none"> <li>○ Water uptake in roots</li> <li>○ Transpiration and factors affecting rate.</li> <li>○ Translocation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Communicable diseases <ul style="list-style-type: none"> <li>○ Types of disease (plant and animal pathogens)</li> <li>○ Immune response</li> <li>○ Vaccination</li> </ul> </li> <li>• Classification</li> <li>• Variation</li> <li>• Adaptation</li> <li>• Evolution and evidence</li> <li>• Biodiversity</li> <li>• Sampling techniques</li> <li>• Calculations of biodiversity</li> <li>• Conservation and preservation of Biodiversity</li> </ul>

<b>Summer Term Teacher 1</b>	<b>Summer Term Teacher 2</b>
Module 5: Communication, homeostasis and energy (After Year 12 examinations)	
<ul style="list-style-type: none"> <li>• Introduction to communication</li> <li>• Temperature control <ul style="list-style-type: none"> <li>○ Ectotherms</li> <li>○ Endotherms</li> </ul> </li> <li>• Nervous system <ul style="list-style-type: none"> <li>○ Layout: CNS, peripheral, autonomic and somatic</li> <li>○ Resting potential</li> <li>○ Action potential</li> <li>○ Propagation</li> <li>○ Synapses</li> <li>○ Reflexes</li> <li>○ Control of Heart rate</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Hormonal communication</li> <li>• Adrenal glands</li> <li>• Pancreas</li> <li>• Glucose control</li> <li>• Diabetes</li> <li>• The Brain</li> </ul>

<b>Autumn Term Teacher 1</b>	<b>Autumn Term Teacher 2</b>
Module 5: Communication, homeostasis and energy (Continued for Year 12)	
<ul style="list-style-type: none"> <li>• Respiration</li> <li>• Photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>• Muscle structure and contraction</li> <li>• Excretion and the liver</li> <li>• Kidney structure and function</li> <li>• Plant growth substances (hormones)</li> </ul>

<b>Spring Term Teacher 1</b>	<b>Spring Term Teacher 2</b>
Module 6: Genetics, evolution and ecosystems: Genetic Control and inheritance.	
<ul style="list-style-type: none"> <li>• Variation review</li> <li>• Mitosis and meiosis review</li> <li>• Regulation of gene expression</li> <li>• Genetic crosses <ul style="list-style-type: none"> <li>○ Monohybrid</li> <li>○ Dihybrid</li> <li>○ Sex linkage</li> <li>○ Linkage</li> <li>○ Epistasis</li> </ul> </li> <li>• Evolution <ul style="list-style-type: none"> <li>○ Population genetics</li> <li>○ Speciation</li> </ul> </li> <li>• Genetic engineering</li> <li>• Gene therapy</li> <li>• PCR and profiling</li> </ul>	<ul style="list-style-type: none"> <li>• Ecosystems <ul style="list-style-type: none"> <li>○ Energy/ biomass transfer</li> <li>○ Nutrient cycling (Carbon and Nitrogen)</li> <li>○ Succession</li> <li>○ Sampling</li> <li>○ Competition</li> <li>○ Predator prey cycles</li> </ul> </li> <li>• Conservation and preservation</li> <li>• Sustainability</li> <li>• Biotechnology: <ul style="list-style-type: none"> <li>○ Cloning</li> <li>○ Microbial growth (culturing microbes)</li> <li>○ Fermenters</li> <li>○ Immobilised enzymes</li> <li>○ DNA Sequencing</li> <li>○ Bioinformatics</li> </ul> </li> </ul>

The exact member of staff teaching these topics may vary based on lesson time available.

<b>Summer Term 1</b>	<b>Summer Term 2</b>
Completion of topics from spring term as above Revision and Examination technique	Public Examinations

*Please note that this timeline may be subject to change.*

### **Assessment and Feedback**

All students will:

- have at least one piece of assessed work reviewed by their teacher per half-term (this increases to two pieces of assessed work if students receive five or more taught hours per fortnight).

- receive feedback which outlines how they should develop their learning. This feedback should be summative, highlighting both key strengths and key areas for development in students' work.
- be given the opportunity to act upon their feedback in a structured task. This task should then be reviewed again by the subject teacher. A review of this task can act as the second assessed task.

### **Resources to support learning beyond the classroom**

**The A level Biology specification can be found here:**

<https://www.ocr.org.uk/Images/687834-download-a-level-specification.pdf>

The links below are to commercial websites used by our students; however, we do not guarantee the quality of all resources available here.

<https://www.physicsandmathstutor.com/biology-revision/>

<https://www.savemyexams.com/-/biology/>