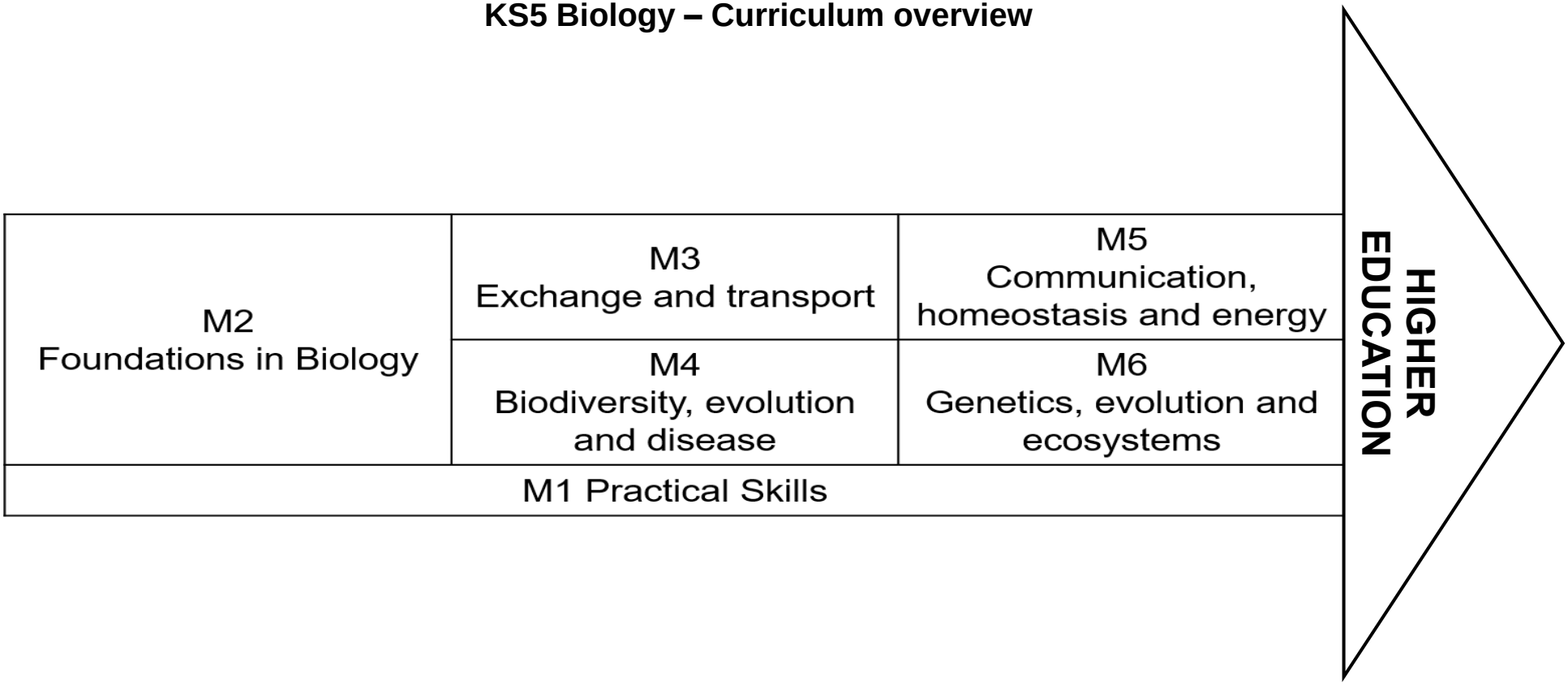
KS5 Biology – Curriculum overview



The above arrow shows the progression of biology topics across Key Stage 5. It shows how substantive knowledge is built upon in a sequential nature to prepare learners for Higher Education. Running alongside and integrated throughout is the thread of working scientifically whereby students develop their knowledge of scientific methods, apparatus and data analysis.

KS5 Biology – Curriculum intent

<table>
<tr><th>Intent</th><th></th><th colspan="3">What new knowledge/content do we introduce?</th><th></th></tr>
<tr><th>By the end of KS5 students are able to…</th><th></th><th colspan="2">Year 12</th><th>Year 13</th><th>Choices</th><th>How does this curriculum incorporate the National Curriculum and go beyond? How does going beyond the NC ensure challenge?</th></tr>
<tr><td rowspan="3">Apply the foundations of biology to various contexts, from the microscopic to the macroscopic.

Have a secure knowledge of the biological systems and processes that occur within organisms.

Understand the interactivity and dynamics between organisms on an ecosystem level.

Conduct and perform a variety of experiments including utilising statistics to analyse data.</td><td>Autumn</td><td colspan="2">Foundations in Biology:
• Cell structure
• Biological molecules
• Nucleotides & nucleic acids
• Enzymes
• Biological membranes
• Cell division, diversity and organisation</td><td>Genetics, Evolution and Ecosystems & Revision
• Cellular control
• Patterns of inheritance
• Manipulating genomes
• Cloning and biotechnology
• Ecosystems
• Populations and sustainability</td><td rowspan="3">With students potentially arriving from multiple schools of diverse science provisions, we begin the course with a prolonged foundation in biology topic. This ensures all learners are equipped with the necessary substantive knowledge to access the following content and acts as a springboard for the subsequent modules.</td><td rowspan="3">A-level Biology goes beyond the national curriculum by providing opportunity for additional challenge and extension within each scheme of work. This often bridges the content between A-level and Higher Education and permits students the opportunity to uncover potential career pathways within the scientific fields.

Further, there are also opportunities to enrich learning beyond the curriculum through the use</td></tr>
<tr><td>Spring</td><td>Exchange and Transport
• Exchange surfaces
• Transport in animals
• Transport in plants</td><td>Biodiversity, Evolution and Disease
• Communicable diseases
• Biodiversity
• Classification and evolution</td><td>Communication, Homeostasis and Energy
• Communication and homeostasis
• Excretion
• Neuronal communication
• Hormonal communication
• Plant and animal responses
• Photosynthesis
• Respiration</td></tr>
<tr><td>Summer</td><td colspan="2"></td><td>Revision and examinations</td></tr>
</table>

	Rationale for this sequence	Students arrive with diverse prior knowledge of relevant biology and chemistry. Therefore, the first topic provides a foundational knowledge of cell theory and the chemistry of life. The content here underpins much of the requisite content needed to access subsequent modules. With the foundations established, students learn exchange and transport. This directly builds upon their knowledge of transport, which is a central component in discussions of exchange surfaces and transport rates. The topic of biodiversity, evolution and disease also builds upon the foundational knowledge of cell structure and biochemistry to investigate disease and immune responses. Moreover, knowledge of DNA is vital in understanding natural selection and variation.	Year 13 builds upon the substantive knowledge of the prior year. For example the topic of genetics, evolution and ecosystems utilises knowledge of biodiversity and ecosystems taught previously to study succession, population dynamics and conservation. Similarly, understanding of homeostasis requires working knowledge of transport physiology and basic biochemistry/cell biology and thus allows students to embed and apply their knowledge in a new context.		of trips in the local area (e.g. treasure trails around Cambridge) or visiting guest speakers.
	How does the KS5 Curriculum build on previous learning at KS4?	In each case, A level biology develops substantive knowledge in specific domains and invites students to make connections and links with existing knowledge. Some examples are included below. GCSE topics of cell biology and organisation are built directly upon here in module 2. GCSE topics of organisation, bioenergetics and homeostasis are extended in module 3 and subsequently 5. GCSE topics of infection & response and ecology are developed in module 4 and subsequently module 6.			