Thomas Mills
High School & Sixth Form

# CURRICULUM OVERVIEW: Biology

The intent of the Year 10 Biology curriculum is to develop skills and knowledge that both broaden and deepen the curriculum learned in Year 9. Some previous content will be revisited and built upon, in addition to some novel topics and concepts that pupils have not met. Biology in Year 10 provides an insight into the human biology side of the subject, exploring the anatomy of the nervous and endocrine system, before studying real life applications of hormones to include contraception, IVF and treating diabetes. The spring/summer term then focuses on the 'bigger picture' where pupils return to studying nutrient cycles and ecosystems, a concept first visited in Year 8.

We aim to:

- Instil curiosity about the natural world and how life is structured and sustained.
- Develop pupils' ability to observe, question, and investigate living organisms using scientific methods.
- Further develop critical thinking and problem-solving skills.
- Develop foundational knowledge of human physiology, including differences between the nervous and endocrine systems.
- Explore the processes of photosynthesis and respiration, highlighting their roles in energy transfer and the maintenance of life on Earth.
- Develop an appreciation of an understand the crucial importance of enzymes as biological catalysts, enabling vital chemical reactions to occur efficiently within cells, as without them, life could not be sustained.
- Encourage scientific thinking through practical investigations, reinforcing theoretical knowledge with hands-on experience.
- Foster curiosity about biological systems, preparing pupils for more advanced study in GCSE Biology and beyond.

Through engaging, practical lessons and real-world applications, pupils will begin to understand the relevance of biology to themselves, society, and the wider world.

Note: Pupils follow the OCR Gateway A specification for the Sciences. In Year 10, the units begin to differentiate in terms of the knowledge required by each course. Combined Science do not cover all details described below in the table, the key differences can be identified by the specifications linked below.

Link to Separate Science specification for Biology (J247) - OCR GCSE (9-1) Biology A (Gateway Science) J247 Specification
Link to Combined science specification (J250) - GCSE - Gateway Science Suite - Combined Science A (9-1) - J250

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| Year 10<br>Term | Topic | Knowledge and Skills | Useful Links |
|---|---|---|---|
| 1 | **B3 – Organism Level Systems** | **Knowledge:**<br>Pupils studying biology explore the nervous system, learning how the brain processes information and how the eyes detect light. They examine the endocrine system, which uses hormones to regulate body functions. Reproduction topics include contraception methods to prevent pregnancy and IVF (in vitro fertilisation) as a fertility treatment. Pupils also study how the body maintains internal balance, focusing on blood glucose regulation through insulin and glucagon. Finally, they learn about the kidney's role in filtering blood, removing waste, and controlling water balance, essential for homeostasis. These systems illustrate how the body coordinates and controls complex biological processes.<br><br>**Skills:**<br>Pupils develop analytical skills by interpreting scientific data, identifying trends, and drawing conclusions. They learn to accurately label scientific diagrams, enhancing their understanding of biological structures and processes. Through graph analysis, pupils extract key information, building confidence in handling and presenting scientific information effectively. | GCSE Biology (Single Science) - OCR Gateway - BBC Bitesize<br><br>Biology Lessons \| GCSE Biology OCR Gateway Higher Triple \| Cognito<br><br>Educake - Online Formative Assessment for Homework and Classwork |

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| **Assessments** | | Regular informal assessment via past paper question practise in lesson time or set for homework. This develops the skills required for answering the GCSE examinations in Year 11, such as decoding questions, command word interpretation and formulating answers appropriate to the numbers of marks available.<br><br>A mid-unit low-stakes assessment and a more formal end-of-unit assessment are completed under exam conditions. Pupils are informed of these in advance with revision opportunities given for homework and in class, if time permits. These assessments are designed to check understanding of key concepts and identify areas for improvement. Pupils receive feedback on both assessments, with time allocated in class to review answers and address misconceptions.<br><br>Checklists that breakdown learned criteria are also used in the unit to help pupils monitor their own progress and reflect on their understanding of the content. | |
| **2** | **B4 – Community Level Systems** | **Knowledge:**<br>Pupils studying ecosystems learn how organisms interact with each other and their environment. They explore food chains and food webs, understanding how energy is transferred through biomass. The concept of biomass helps explain energy loss at each trophic level. Pupils also investigate nutrient cycles, such as the carbon and nitrogen cycles, which recycle essential elements through ecosystems. Decay is studied as a key process in breaking down dead material, returning nutrients to the soil. Decomposers like bacteria and fungi play a vital role in this process, helping to maintain the balance of ecosystems and support new growth.<br><br>**Skills:**<br>Pupils interpret nutrient cycle diagrams to understand the movement of essential elements like carbon and nitrogen through ecosystems. They apply mathematical | GCSE Biology (Single Science) - OCR Gateway - BBC Bitesize<br><br>Biology Lessons \| GCSE Biology OCR Gateway Higher Triple \| Cognito<br><br>Educake - Online Formative Assessment for Homework and Classwork |

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| | | skills to calculate energy efficiency in food chains, using data to evaluate energy transfer between trophic levels. These activities strengthen scientific reasoning and quantitative analysis in ecological contexts. | |
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