Biology

Curriculum Intent

We follow AQA at GCSE and OCR at A level. The courses are broad, balanced and include a diverse range of practical lessons. At each Key Stage topics will include both plant and animal biology. The aim is that students develop a comprehensive understanding of scientific method, how science works and how this is applied to the natural world.

Key Stage 4

Year 10 begins with the basics of Biology; Cells, Tissues, Organs and Systems. This journey started in Year 7 where these ideas were introduced at their most basic level. We then apply these concepts and ideas to more complex whole organism examples. All scientists must be equipped with skills that allow successful analysis of data and critical thinking to develop conclusions and hypotheses, so students take part in practical lessons. These practicals also develop motor skills in handling a range of scientific equipment. There is no coursework in Biology at KS4, however students will complete a series of experiments to target core practical skills.

Key Stage 5

Students choose A Level Biology because they have a keen interest in Biology as an academic subject and/or they wish to pursue a career in Biology related disciplines. Building on the skills and content developed in KS4 we delve much deeper into each topic. We cover the fundamentals key to plants and animals first, then apply these concepts to the whole organism. Mathematical, practical, analytical and evaluative skills are of greater importance and more emphasis is placed on these in each topic.

There is no coursework at A Level, however students complete a series of practical assessments which fall into one of 12 groups and contribute to the award of a Practical Endorsement. The aim of these is to further develop experimental skills, such as using a microscope, dissection and data collection in the field.

Curriculum Implementation

Key Stage 4: GCSE (AQA)

Year 9	Year 10	Year 11
• Cell structure • Cell transport • Cell division	• Tissues and the digestive system • Organisation and transport in animals and plants • Non-communicable diseases • Communicable diseases • Preventing and treating disease • Photosynthesis	• Respiration • The nervous system • Hormonal coordination • Homeostasis • Reproduction • Variation and evolution • Genetics and evolution

Key Stage 5: A Level (OCR)

Year 12	Year 13
• Biological molecules • Nucleic acids • Cell structure • Biological membranes • Cell division, diversity and organisation • Enzymes • Exchange surfaces • Transport in animals • Transport in plants • Disease and the immune system • Biodiversity • Classification and evolution	• Homeostasis and excretion • Hormones • Plant responses • Nerves and coordination • Genomes • Cloning and biotechnology • Photosynthesis • Respiration • Cellular control • Inheritance • Ecosystems • Populations and sustainability

Impact

Key Stage 3

Scientific knowledge and conceptual understanding

Developed through the specific disciplines of Biology, Chemistry and Physics. Our schemes of work aim to give students an understanding of the big ideas in Science: the links between structure and function in living organisms, the particulate model as the key to understanding the properties and interactions of matter in all its forms, and the resources and means of transfer of energy as key determinants of all of these interactions.

Nature, processes and methods of science

Different investigative techniques help students to answer scientific questions about the world around them. They are taught about working scientifically through a range of practical investigations that are always clearly related to the science content in the programme of study. Students develop key practical skills such as use of microscopes, safe handling of chemicals and

basic equipment, to carry out simple chemical reactions and measurements of time, distance and forces in different contexts.

Uses and implications

Ensuring students are equipped with the scientific knowledge required to understand Science, today and for the future. Evaluation and critical analysis of information is encouraged especially on behaviours that impact our environment. We incorporate topical issues into our teaching; our teaching of sustainability and the environment links directly to our Schemes of Work. Booklets support all students and glossaries are used as a tool to encourage the learning of scientific vocabulary.

Key Stage 4

Our curriculum at AHS extends past the classroom; we want students to achieve the very best examination results possible, but we believe our curriculum goes beyond what is examinable. As a department, with our student Ambassadors, we provide lunchtime events for younger students, and for those in Year 10 and above, Biology Clinics and discussion groups. Creative teachers produce quizzes, logic problems, projects, practical sessions and interactive lessons with hands-on tasks. We link information about careers related to topics being taught and further links to the environmental impact of the processes being studied.

Our topic booklets ensure that students spend more time applying knowledge rather than copying notes. They also provide a detailed checklist of the content for that particular part of the course. We also ensure that progress is monitored with frequent end of topic tests.

The department, including the technical support staff, is co-operative and works as a team with discussions every day sharing ideas and offering each other help and advice. As a knowledge engaged curriculum we believe that knowledge underpins and enables the application of skills.

The AQA separate science course provides students with a firm foundation from which to progress on to A Level studies. The topics give students insight into what they will meet in the A Level course which builds on the knowledge and skills acquired at KS4.

Investigative and practical skills acquired in KS3 are built upon with students using the Required Practicals as an important tool for linking practical and theoretical work.

Key Stage 5

We enter year 12 students for the Intermediate British Biology Olympiad and Year 12 and Year 13 students for the British Biology Olympiad. We also provide mock interviews and MMI practice for those applying to universities with interviews. There is a MedSoc for those wishing to study Medicine at university where Year 12 students can go along and gain information about the application process from Year 13 students. As a department we provide lunchtime clinics to support Year 12 and Year 13 students who wish to secure their understanding. Our Biology Ambassadors are key in helping with the running of our lunchtime clinics, discussion groups and programme of guest speakers. They also coordinate tutoring for our year 10 and 11 students on a 1 to 1 basis.

The OCR course provides a solid foundation on which students can move on to any course, notably Medical Sciences and Biological Sciences. The PAGs provide students with the practical skills required to move on to studying a Science subject at a higher level and the questioning adopted by OCR encourages students to apply knowledge and to ‘think outside the box’. A strong understanding at KS4 is vital for the smooth transition from GCSE to A Level. We have a Transition Programme which starts at the end of Year 11 and consists of tasks to help gain the key skills and knowledge to ease the transfer from GCSE to A Level.

As a knowledge engaged curriculum we believe that knowledge underpins and enables the application of skills; both are entwined. As a department we define the powerful knowledge our students need and help them recall it by providing detailed checklists for the topics we teach. Quick quizzes help the students to recall key knowledge from previous topics as well as from the previous lesson. Each student from Year 9 upwards has a login for Kerboodle and many of our homework assignments are set on Kerboodle, where tasks can be set involving interactive quizzes, crosswords, drag and drop exercises which are intellectually demanding enough to challenge out A/A* students. End of topic tests are set frequently and provide a tool to monitor progress. Introduction of a more synoptic element to tests later in the course has helped students make those intrinsic lateral links across topics, vital if they are to gain a high grade at A Level.