

BIOLOGY CURRICULUM OVERVIEW



Biology is an exciting and popular subject at Tiffin School. The Biology team are all incredibly passionate about their subject and they all channel that passion into planning and delivering lessons that inspire and engage our students.

KS3 - The work the students do in Year 8 builds on the science skills delivered in Year 7. GCSE begins in year 9 so in year 8 we make sure to cover anything in the National Curriculum that is not covered in Year 7 or GCSE. We also use year 8 to teach the foundations of the subject. Early understanding of topics such as cells and metabolism provide the basic knowledge that students need when entering GCSE Biology in Year 9. We also use Year 8 to teach students some important topics related to teenager development such as; puberty and reproduction, hygiene and healthy, balanced diets. Students will also spend a lot of their time in double lessons continuing to further their understanding of laboratory skills and of the scientific method that they will have begun in Year 7 Science.

KS4 - At GCSE, we follow the GCSE Biology AQA specification. As a department, we look regularly at what other examination boards expect of students to make sure we are providing the best Teaching & Learning for our students. We begin teaching the GCSE content in Year 9 and delivery is spread over 3 years to allow for adequate time to investigate each topic to an appropriate level of detail. The Biology department at Tiffin, after many discussions, have decided to alter the order of the topics that we teach from the AQA specification to give students the best opportunity to understand later topics fully. All students, besides Computer Scientists, start on the separate science course where students will be rewarded with one GCSE grade per science (i.e. one for Biology, one for Chemistry and one for Physics). Computer scientists learn all three sciences (with slight reductions in the content they need to know) and are awarded with a separate Computer Science grade and a dual award for combined science (the equivalent of two GCSE grades). It should be noted that doing combined science in no way disadvantages students when applying to study any of the sciences at A Level.

KS5 - We have followed the AQA A Level Biology specification for many years but, again, look at the offerings from other examination boards regularly to ensure we continue to make the right choice by sticking with AQA. The specification is divided into Year 12 and Year 13 topics. Students are taught the content by 2 different teachers throughout the course. Furthermore, students have extra assessment periods with a third teacher. These sessions are used to develop such things as; maths in biology skills, essay writing technique and examination practice. We also use these sessions for regular diagnostic testing of the students which gives students a good indication of how they are getting on with learning the content from lessons. We also deliver fortnightly lectures that are closely linked to the specification but take these topics a little further and help to link topics together to give the students a more holistic approach to their understanding of A Level Biology.

KS3 BIOLOGY CURRICULUM



	Year 8	Year 9
Autumn Term 1	<p>Cells Students begin learning about the foundations of life processes, how cells work, how cells divide, how cells become specialised and how cells are organised into tissues and tissues into organs.</p>	<p>Evolution To begin GCSE, students learn about the theories of evolution and how these theories have been developed and accepted within the scientific community.</p>
Autumn Term 2	<p>Nutrition and Metabolism Students then learn about the modes of nutrition and begin looking at the foundations of photosynthesis, respiration and enzyme activity during digestion.</p>	<p>Evolution/Biochemistry In biochemistry, students learn about the key biological molecules and enzyme activity.</p>
Spring Term 1	<p>Reproduction To begin the Spring term, students learn about the types of reproduction, focusing mostly on sexual reproduction in both plants and animals, and puberty.</p>	<p>Biochemistry See above.</p>
Spring Term 2	<p>Classification and Variation Students then learn about how organisms are grouped and how they vary within and between species.</p>	<p>Cells and Membranes Students learn about the differences between eukaryotic and prokaryotic cells and the different types of transport in and out of cells.</p>
Summer Term 1	<p>Classification and Variation cont./Revision for EoY/Start of Ecology</p>	<p>Cells and membranes/Cell division and differentiation</p>
Summer Term 2	<p>Ecology Students learn how organisms interact with each other within their local environments. Students also learn the foundations of ecological sampling techniques.</p>	<p>Cell division and differentiation Students learn about mitosis, stem cells, how cells become specialised and different types of specialised cells in both animals (e.g. nerve cells) and plants (e.g. root hair cells).</p>

KS4 BIOLOGY CURRICULUM



	Year 10	Year 11
Autumn Term 1	<p>Central Themes Students learn about DNA structure and protein synthesis.</p>	<p>The human nervous system Students learn about how messages are sent around the body, how the eyes work and how the brain works.</p>
Autumn Term 2	<p>Animal and Plant organisation Students learn about specific tissues and organ systems in both animals (e.g. digestive system) and plants (e.g. vascular tissue)</p>	<p>Endocrine system/Plant coordination Students learn about how hormones work and examples of processes that are controlled by hormones e.g. the menstrual cycle. Students also learn how plant growth is controlled.</p>
Spring Term 1	<p>Bioenergetics/Infection and response In bioenergetics, students learn about photosynthesis and respiration. In infection and response, students learn about different types of diseases, how pathogens are spread and how the immune system works.</p>	<p>Homeostasis Students learn about feedback systems in animals such as how temperature is controlled and how blood glucose concentration is controlled.</p>
Spring Term 2	<p>Preventing and treating disease/Non-communicable disease/ Plant disease Students learn about vaccination and treating disease symptoms and causes. Furthermore, they learn about diseases that are unable to be passed between humans (e.g. cancer). They also learn about diseases that affect plants and how plants prevent infection.</p>	<p>Inheritance In inheritance, students learn about meiosis, the mechanism of inheritance and inherited diseases.</p>
Summer Term 1	<p>Ecology Students learn about interactions between organisms, food webs, ecological sampling and how we produce food sustainably.</p>	<p>Human Impact Students learn about how human activity has affected things such as climate change and pollution. Furthermore, students look at methods of slowing/reversing this change.</p>
Summer Term 2	<p>Ecology See above.</p>	

KS5 BIOLOGY CURRICULUM



	Year 12		Year 13
Autumn Term 1	Biological molecules/Cells Students learn about key biological molecules such as water, proteins, carbohydrates and nucleic acids. Students also learn about cell ultrastructure in both eukaryotes and prokaryotes, microscopy, cell division, transport across membranes and the immune system.		Photosynthesis and Respiration/Response to stimuli Students learn about the different steps in photosynthesis and respiration. Students also learn about how the nervous system works and how muscular contraction works.
Autumn Term 2	Biological molecules/Cells See above.		Ecosystems/Homeostasis Students build on their understanding of ecosystems that they started developing on the field course in the summer of year 12. This includes nutrient cycles, how energy is transferred between trophic levels and how energy is lost. In homeostasis, students learn about the control of heart rate, glucose regulation and osmoregulation.
Spring Term 1	Exchange and transport/Variation Students learn about gas exchange in different types of animals and plants and transport of substances around the body. Students also learn about genetic variation, protein synthesis, selection and methods for investigating diversity.		Inheritance and Selection/Gene expression In inheritance, students learn about the different mechanisms of heredity and how this affects populations and natural selection. In gene expression, students learn about mutations and how gene expression is regulated in cells.
Spring Term 2	Exchange and transport/Variation See above.		Populations/DNA technology In populations, students learn about interactions between organisms such as competition and predation and human population dynamics. In DNA technology, students learn about genetic engineering and how DNA can be artificially copied and added to organisms' genomes.
Summer Term 1	Revision/Exams		Revision/Examination Prep.
Summer Term 2	Consolidating knowledge, enrichment and progression activities	Consolidating knowledge, enrichment and progression activities	