Biology at Samuel Whitbread Academy

Intent	Biology A level is a highly respected A level, with its broad variety of tested skills, and it is a good choice for many degrees and careers. With the future in the hands of this generation, biology is a pivotal subject linking to both chemistry and physics to understand practical ways of helping combat human driven climate change and cutting-edge medical research and procedures. It also complements geography to help with maintenance of biodiversity and conservation of species and habitats or even with the ever-growing incidences of mental health disorders due to our online social lives and pressures, psychology and sociology are good partners too. The intent of the course is to broaden the student's knowledge and understanding of the living world around them and prepare them to use that knowledge in whichever direction they undertake in the future, as well as being a responsible member of society. A level Biology journeys into the human body, how it works, at a cellular level and a systemic level. To make connections and spot patterns between different systems and molecules and see how they have evolved. We also look at animal physiology, finding how evolution has taken a different route as it diverged into different lineages of the animal kingdom. Moving into the plant kingdom and the world of microorganisms, we explore the ways in which plants can provide the biomass for all life exploring the biochemistry as it happens. Learning about bacteria and viruses and arming ourselves with the knowledge of how important they are to the world and are not just the pathogens of our lives. The A level Biology course covers a wide breadth of topics and scientific skills to prepare students for any further education or career they choose to develop into next.
Implementation	A-level Biology is split into 8 main topics which synoptically link together and emphasis is made throughout of where these links are and adheres to the pedagogy of spiral learning. We have an experienced teaching team, capable of teaching all aspects of the course which allows them to make these connections throughout their teaching. We also focus on scientific skills: practical, analytical and evaluative as well as the use of statistics and understanding when and how to use them. In all these topics, the students need to learn facts and build a body of knowledge but also to understand and apply the ideas. Many topics include calculations and they should feel comfortable rearranging equations and using numbers. Importantly, biology is a hands-on science and they will carry out experiments on a regular basis. This is to consolidate their theory work, but also provide them with the opportunity to use new apparatus and build their skills and confidence to complete safe and accurate practical work. To support and nurture a future learner of any discipline, we teach the techniques required to prepare for lessons, study independently and revise. Lessons at the start of the course focus on teaching these skills then follow through the course by using preparation tasks, homework tasks and revision tasks which are set on Edulink to help the students manage their time and know exactly what to do when their study time and prep times come upon them. We hope that this supported step toward independence will allow them to get into good study habits and allow them to be more independent toward the end of year 13 and then beyond. We assess progress through regular assessments, a mid-topic and end of topic assessment then put in place support where needed based on their progress. Support is individualised to the students' needs at any given time, but usually teacher time is a part of that support.

Implementation	**Key Stage 5: Year 12**	We start by looking at basic biochemistry and cellular knowledge, using what they learnt at GCSE and building upon this to add in the level of detail and understanding required. Working on key ideas that repeat throughout the complete study of biology, unpinning how biological molecules interact with each other in a number of ways and cell functions that feed through to all other areas of study in this rich and involved science. We then present the idea of adaptations of gas exchange surfaces and then link to many different organisms and to different disease models, building on the basic ideas and feed through to complex problems. We also begin the journey into genetics, introducing the particular language involved and the main ideas of how life evolved and is still evolving on Earth.
	Key Stage 5: Year 13	As we move into year 13 the details and processes are dealt with an attention to detail to help to start model and explain how all life processes work. Building on the work from biological molecules into biological chemical pathways and cascades which tightly govern the expression of the genes and allow cells to function as they are intended, we link this across the prokaryotes and eukaryotes and link to the bigger pictures of farming and eutrophication, conservation and succession. The knowledge of genetics is taken further and the world of research and research laboratory skills is opened up with a detailed journey through the use of genetic engineering and a lab workers bread and butter techniques through which all other lab techniques are developed upon.

Impact	Our intent is to provide students with an engaging and informative learning journey that enables them to benefit from the work they have undertaken in any given career pathway. To prepare them especially for further scientific study so that they may also have an impact on the world of science and ultimately the human race. By using the topic assessments and more involved IPEs we are able to steer students to be able to apply this wealth of knowledge and understanding to gain the qualification they need to make their next steps. We use teacher assessment for these tests, peer assessment for exam questions undertaken in class and self-assessment guided by the teacher. Feedback is given to students in the most useful way to suit the nature of the assessment. This can be both written and verbal.