

BIOLOGY

AS / A Level:

Course Content

The science of life is truly amazing and this course has been designed to engage and inspire by showing you how an understanding of many contemporary issues requires a grasp of fundamental biological ideas. At Fullbrook 6 we have selected to teach AQA AS and A2 Biology, this course is based on a concept approach which is then linked to current up to date contexts. Each topic begins with an overview that puts the topic in a broader biological context and links the topic to a wider understanding.

Our aim is to enable you to develop your interest in, and enthusiasm for, biology including developing an interest in further study and careers in biosciences. You will have the opportunity to develop an awareness of the relevance of biology to everyday life and how society makes decisions about biology-related issues and how biology contributes to the success of the economy and society.

AS

The AS consists of 4 topics, 1, 2, 3 and 4. All 4 topics are assessed by written examination papers. There are 2 papers, both will examine content from topics 1 to 4. This means students know they will have to revise the entire AS content for both exams.

Topic 1: Biological macromolecules

Topic 1 focus on building an understanding of the molecules that all living organisms have in common. This includes looking at carbohydrates, proteins and lipids, the structure of these molecules and their roles within organisms. It then looks at nucleic acids and their role in inheritance and protein production. Finally it looks at the most common component of cells, water.

Topic 2: Cells

Topic 2 looks at cells, the basic features in common and the differences between cells from the different kingdoms. This is followed by looking at how new cells are made by binary fission in prokaryotic cells and by mitosis and meiosis in eukaryotic cells. The focus then shifts to look at the importance of cell membranes in the functioning of cells, cell recognition and finishes by putting this in context by looking at the immune response.

Topic 3: Organisms exchange substances with their environment

Topic 3 focuses on the concepts surrounding the fact that organisms must keep their internal environment separate from the external environment. It starts by looking at exchange of substances on a cellular level and then builds to look at the role of specialised organs involved in exchange in multicellular organisms.

Topic 4: Genetic information, variation and relationships between organisms

Topic 4 looks at biological diversity, looking at variation within species and between species. It focuses on the causes of these genetic differences, looking at the structure of DNA, genes and how genes control protein synthesis. It then looks at mutations and how this is the cause of biodiversity.

A2

The A2 course is made up of 8 units, 4 from the AS course and 4 further units, 5 to 8. The assessment for the A2 course is made up of 3 examinations. Paper 1 assesses topics 1 to 4, paper 2 assesses topics 5-8 and paper 3 which is synoptic and assesses all units 1-8.

Topic 5: Energy transfers in and between organisms

Topic 5 focuses on the fact that life depends on continuous transfers of energy. This topic looks at the processes of photosynthesis and respiration, looking in detail at the biochemical pathways involved in these processes. A key focus is on the generation and use of ATP. This topic finishes looking at the flows of energy and nutrients within the ecosystems organisms are found in.

Topic 6: Organisms respond to changes in their internal and external environment.

Topic 6 looks at how organisms respond to changes in their environment. This includes looking at how plants control their growth and life cycles through the use of plant growth substances and how animals use their nervous system and a hormonal system to maintain a constant internal environment. There is a large focus on how neurones work,

starting with reception of changes to the control of effectors and how hormones are used in homeostasis.

Topic 7: Genetics, populations, evolution and ecosystems.

Topic 7 looks at genetics and the science of inheritance and links this to the theory of evolution that underpins modern Biology. This builds to look at how organisms interact with each other and abiotic factors to make a dynamic ecosystem.

Topic 8: The control of gene expression

Topic 8 builds on topics 1, 4 and 7 and looks at greater depth at how genes control the features of cells and how mutations will alter the proteins being produced and therefore the functioning of cells. It also looks at epigenetics and gene expression, the controlling of the production of these proteins.

Finally it looks at human manipulation of the genome through the human genome project and recombinant DNA technology.

Teaching and learning methods

The taught part of the course will take many different forms including note-taking, group work and discussion, written activities to apply scientific concepts, the use of electronic animations, individual/independent study and research, practical work, ICT research, modelling and a visit. It is imperative that you are proactive in expanding your knowledge through independent study.

Skills and commitment

You should have a genuine interest in the fascinating and fast developing world of Biological Sciences. The course will study the key concepts underpinning biology today through real-life contexts. The course is demanding and will require much time and effort, but as a successful candidate you will develop a range of skills and a thorough knowledge of Biology which will relate, in a wider sense, to everyday life.

Cost

AQA have textbooks for the AS and A2 courses, students will need to have access to these and will be expected to purchase their own, the rough cost of this would be £20 each. A small voluntary contribution will be requested for past paper exam packs.

Progression

Biology links effectively with a range of subjects. A solid understanding of maths and chemistry as well as biology at GCSE is required. You may go on to study Biology at University or a broad range of related studies such as marine biology, environmental management, conservation, ecology, medicine, dentistry, biotechnology, forensics and many more.

Entry requirements

Grade 6 in two GCSE Sciences, 6 Mathematics and 5 English is recommended.

Contact

For further information contact Mr Sison, Head of Biology.