



# A LEVEL Biology Edexcel SNAB A

## WHAT DO I NEED TO KNOW OR BE ABLE TO DO BEFORE TAKING THIS COURSE?

- You should have achieved two grade 6s in Science GCSEs and a grade 6 in Mathematics. This course is suitable for students who:
- have an interest in and enjoyment of Biology and problem solving
- want to find out how and why living things work
- enjoy active learning including ICT-based activities and practical work
- enjoy carrying out investigations which involve imaginative and logical thinking
- want to use Biology to complement other qualifications (e.g. Mathematics, Geography, PE) or progress onto Higher Education or employment
- want a grounding in a relevant worthwhile qualification of recognised value
- want to broaden their educational experience

## WHAT WILL I LEARN ON THIS COURSE?

The aims of the GCE in Biology are to enable students to:

- develop their interest in and enthusiasm for Biology, including developing an interest in further study and careers in the subject
- appreciate how society makes decisions about Biology-related issues and how Biology contributes to the success of the economy and society
- develop and demonstrate a deeper appreciation of the skills, knowledge and understanding of How Science Works
- develop essential knowledge and understanding of different areas of Biology and how they relate to each other.

Students will sit three written exams:

**Paper 1: The Natural Environment and Species Survival** examines Topics 1, 2,3,4,5 & 6.

**Paper 2: Energy, Exercise and Co-ordination** examines Topics 1, 2,3,4,7 & 8.

**Paper 3: General and Practical Applications in Biology** includes questions from topics 1-8, including synoptic questions that may draw on two or more different topics. It will also include a section underpinned by a pre-release article pre-released 8 weeks before the examination.

Students must complete all assessments (each lasting 2 hours and consisting of 100 marks) in May/June of Year 13. Students are also expected to carry out eighteen core practical experiments.

Students will be awarded a practical skills endorsement to their A level if they show sufficient practical competency in the core practical work. This endorsement or lack of it will not affect the A level grade.

## TRIPS

Fieldwork takes place during the summer term after the Year 12 exams.

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**Topic 1: Lifestyle, Health and Risk** - builds on students' knowledge of the circulatory system and the importance of lifestyle choices to health. The role of diet and other lifestyle factors in maintenance of good health is considered with particular reference to the heart and circulation and to cardiovascular disease (CVD). The structures and functions of some carbohydrates and lipids are also detailed within this context. Ideas about correlation, causation and the concept of risks to health are covered.

**Topic 2: Genes and Health** - Considers the following biological principles through the context of the genetic disease cystic fibrosis: the properties and transport of materials across cell membranes and gas exchange surfaces, DNA structure and replication, protein synthesis, enzymes and monohybrid inheritance. The social and ethical issues surrounding the genetic screening for genetic conditions are also discussed.

**Topic 3: Voice of the Genome** - Follows development of multicellular organisms from single cells to complex individuals. Cell ultrastructure, cell division, the importance of fertilisation, the roles of stem cells, gene expression, cell differentiation and tissue organisation are all studied, as are the roles of the genotype, epigenetics and the effect of environment on phenotype.

**Topic 4: Biodiversity and Natural Resources** - Focuses on biodiversity and the wealth of natural resources used by humans. Why there are so many different species is considered first, with the concept of niche and adaptation explored. The topic looks at how all this diversity has come about through adaptation and natural selection and how this leads to evolution. The concerns for disappearing biodiversity and loss of potential natural resources are used to highlight the need for biologists to identify, name and classify species. Traditional and novel uses of plants and plant fibres and the use of chemical extracts from animals and plants are covered. The relationship of plant anatomy to function and the structure and role of cellulose and starch is studied. The topic ends with the issue of sustainability and the role of zoos and seed banks in conservation of endangered species.

**Topic 5: On the Wildside** – Builds an appreciation that photosynthesis is the primary process that underpins the majority of ecosystems, and provides students with an understanding of how ecosystems work. The topic continues by looking at whether climate change will lead to extinction of species or evolution by natural selection, and looks at the evidence for climate change and its effects on plants and animals. By the end of the topic students should appreciate how scientific understanding can make us aware of our responsibilities as stewards of the environment.

**Topic 6: Immunity, Infection and Forensics** - Starts by looking at how forensic pathologists use a wide variety of analytical techniques to determine and identify the time and cause of death of organisms, including humans. It then considers how bacteria and viruses use a variety of routes into their hosts and how hosts have evolved barriers and internal mechanisms to combat infections. These protections are not always successful and many people in the world still die from infectious diseases. This topic also investigates the evolutionary battles that take place between invading pathogens and their hosts. The topic ends by looking at hospital-acquired infections, their prevention and control.

**Topic 7: Run for your Life** - Centred on the physiological adaptations that enable animals and humans, particularly sports people, to undertake strenuous exercise. The topic explores the links between an animal's physiology and its performance. The biochemical requirements for respiration are summarised and the links between homeostasis, muscle physiology and performance are examined. It ends by looking at how medical technology is enabling more people to participate in sport, and raising the issue of whether the use of performance-enhancing substances by athletes can be justified.

**Topic 8: Grey Matter** - The scene is set by considering how the working of the nervous system enables us to see. Brain imaging and the regions of the brain are considered. The topic also demonstrates how an understanding of brain structure and functioning is relevant to issues such as the response to stimuli, the development of vision and learning. It investigates how imbalances in brain chemicals may result in conditions such as Parkinson's disease, which can be treated with suitable drugs. Students discuss the ethical issues raised by the Human Genome Project and the risks and benefits of using genetically modified organisms.