



Haverhill 14-19
LearningPartnership

A-Level Biology

Course information

Why choose A-Level Biology?

The Biology course run here at Samuel Ward Arts and Technology College is the Salters Nuffield Advance Biology (SNAB).

SNAB is taught through real-life biology. For example, most A-level biology courses start with cell biology or biochemistry. We don't. We start with an account of Mark, a 15-year-old who had a stroke, and Peter, an adult who had a heart attack. We then go on from the details of their cases to look at the factors that make it more likely that any of us will suffer from a stroke or heart attack. This allows you to meet the biochemistry of fats and carbohydrates bit by bit, as you need to know them to understand about strokes and heart diseases, rather than all at once.

Course Outline:

Topics

In the AS year you study four topics. Each takes about half a term, including practical work. This gives time to do coursework and to revise for the exams. Here is a summary.

Topic 1 Lifestyle, health and risk

- The concept of risks to health, how these can be assessed, and what affects our perceptions of risk.
- The heart and circulation, and understanding how these are affected by our diet and activity.
- The biochemistry of food and why this matters.

Topic 2 Genes and health

- How changes in DNA can cause genetic disease, using cystic fibrosis as an example.
- Cell membrane structure, how substances move across membranes, and how proteins are made.

- Treatments for genetic disease, and the ethical issues raised by today's genetics.

Topic 3 Voice of the genome

- Gene structure and function.
- Stem cells, their potential in medicine, and the arguments for and against their use.
- Regulation of gene expression and the control of development in organisms.

Topic 4 Biodiversity & natural resources

- What is biodiversity? classification, adaptation and natural selection. Disappearing biodiversity.
- Plant anatomy and function; human use of plants.

A/2 Biology outline

Topics

Just as in A/S the A/2 Course is taught in modules based around real life biology. It enhances the understanding gained at A/S as well as developing new concepts. The A/2 course is taught in four modules. Again just like A/S each module takes about ½ a term, including practical work.

Topic 5 On the wild side

- Photosynthesis and an understanding of how ecosystems work.
- Climate change and its relationship with extinction of species or evolution by natural selection.
- Evidence for global warming and its effects on plants and animals.

Topic 6 Infection, immunity and forensics

- How forensic pathologists use a wide variety of analytical techniques to determine the identity of a person or other animal, and to establish the time and cause of death of organisms, including humans.
- How bacteria and viruses use a variety of routes into their hosts, and how hosts have evolved barriers and internal mechanisms to combat infections.
- The evolutionary battles that take place between invading pathogens and their hosts.

Topic 7 Run for your life

- Physiological adaptations that enable animals and humans, particularly sports people, to undertake strenuous exercise.
- Respiration, and homeostasis, muscle physiology and performance.
- How medical technology is enabling more people to participate in sport, and by raising the issue as to whether the use of performance-enhancing substances by athletes can be justified.

Topic 8 Grey matter

- How the working of the nervous system enables us to see. Brain imaging and the regions of the brain are considered.

- Brain structure and functioning and its relevance to 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, and its treatment with drugs is investigated.
- Discussions about the ethical issues raised by the Human Genome Project, and the risks and benefits of using genetically modified organisms

Field Trips

Every year the students have the opportunity to participate in field trips that allow them experience the biology discussed in class, outside of the classroom. These trips include:

- Colchester Zoo – To examine the role of zoos in conservation.
- Babraham Institute – to work with scientists that are researching cutting edge biology in the most up to date research labs.
- Sanger Centre – to experience the human genome project first hand.
- Talks by Sir Robert Winston and other renowned scientists.

Exams

The exams in SNAB are pretty much like those in any advanced biology course, but they reward your ability to reason biologically and to use what you have learnt in new contexts. Most of the exam questions are structured, though as you go through the course you begin to do short essays, building up to longer ones. Essay writing will be very useful for you if you go on to university or to any sort of job that requires you to be able to write reports.

What is the coursework like?

At AS, the coursework includes you writing a report either on a biological issue that interests you, or on a visit to a place you have been to where biology is used. Students seem to enjoy this. The other aspect of the coursework is based on the practicals you do.

At A/2 there is only one piece of coursework which is a biological report based upon a practical carried out by the student. The student chooses the title and uses their knowledge to design and carry out the practical.

ICT

At AS there are animations on such things as protein synthesis, the control of heart rate, and cell division. These help you to understand the more difficult bits of biology. There are maths and chemistry tutorials to help you with these as you meet them in biology. There are also review tests (so you can check you know what you need to know before starting the next topic), more formal end-of-topic tests, an interactive glossary to explain terms in the student books, and so on. You access all this via the internet.

Careers and progression:

Previous students have gone to study such varied courses such as Biology, Biochemistry, Physiotherapy, Law, at universities such as York, Nottingham, UEA to name just a few.

Enquiries:

All enquiries regarding this course should be made via the Science Department at Samuel Ward Arts and Technology College