

During the first year you will study:

Topic 1 Lifestyle, health and risk

This topic builds on the knowledge and understanding which students bring to the course on the functioning of the circulatory system and the importance of diet in maintaining the body. The role of diet and other lifestyle factors in maintaining 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

This topic considers the following biological principles: the properties of and transport of materials, across cell membranes and gas exchange surfaces, DNA structure and replication, protein synthesis, enzymes and monohybrid inheritance through the context of the genetic disease cystic fibrosis. The potential that gene therapy offers as treatment for cystic fibrosis is examined. The topic also allows for discussion of the social and ethical issues surrounding the diagnosis and treatment of genetic conditions.

Topic 3 The voice of the genome

This topic follows the story of the development of multicellular organisms from single cells to complex individuals. Cell structure and ultrastructure, cell division, the importance of fertilisation, the roles of stem cells, gene expression, cell differentiation and tissue organisation are all considered within this topic, as is the role of the genotype and the effect of the environment on phenotype.

Topic 4 Biodiversity and natural resources

The topic focuses on biodiversity and the wealth of natural resources used by humans. The meaning of biodiversity and how it can be measured is considered first, and how all this diversity has come about through adaptation and natural selection. It has sections on both traditional and novel uses of plants and plant fibres, and the use of chemical extracts from animals and plants. The concern for disappearing biodiversity and loss of potential natural resources is used to highlight the need for biologists to identify, name and classify species. The topic finishes by looking at the role of zoos in the conservation of endangered species. General biological principles covered include the relationship of plant anatomy to function, and the structure and role of cellulose and starch.

During the second year you will study:

Topic 5 On the wild side

This topic builds an appreciation that photosynthesis is the primary process underpinning 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 global warming 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 Infection, immunity and forensics

This topic starts by looking at 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. 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.

Topic 7 Run for your life

This topic is centred on the physiological adaptations that enable animals and humans, particularly sports people, to undertake strenuous exercise. It explores the links between an animal's physiology and its performance. The topic summarises the biochemical requirements for respiration, and looks at the links between homeostasis, muscle physiology and performance. It ends by looking at 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

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 such issues 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, and its treatment with drugs is investigated. Students discuss the ethical issues raised by the Human Genome Project, and the risks and benefits of using genetically modified organisms.

What can the course lead to in terms of higher education and future careers?

This course is an excellent foundation (and indeed essential) for further study of biology, biomedical science, medicine, botany, veterinary science, dentistry, physiotherapy and related subjects such as pharmacy, and pharmacology. It is also highly recommended for other sciences. This course also provides a valuable education if you take biology no further but wish to pursue further education as it is a highly respectable academic course which teaches you the importance of planning, investigation, problem solving and research.

What are the formal entry requirements for this course?

A level Biology is both a theory and practical based course. National evidence suggests it is difficult to succeed unless you have an appropriate base of knowledge and a good track-record of success in exam based courses at GCSE. To ensure you have a reasonable chance of success our recommendation is at least 66 in GCSE Combined Science (or 6 in GCSE Chemistry with a grade 6 in either Biology or Physics) together with a 6 in GCSE Maths (Higher Level).

Why should I consider taking an A level in Biology?

It will enable you to develop a wide range of transferable skills. It will also help develop your interest and enthusiasm for biology, including developing your interest in further study and careers in biology. The content allows you to develop your interest in the human biology and its mechanics as well as understanding the importance of the plant world around us. It will help you appreciate how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.




How will I be examined?

There are 3 papers at the end of the 2 year course all equally weighted (33.33%)

Paper 1 - The natural environment and species survival

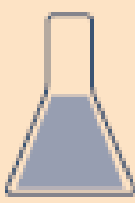
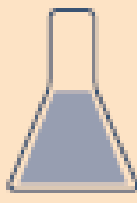
Paper 2 - Energy, Exercise and co-ordination

Paper 3 - General and practical applications in Biology.

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| A level All papers include assessment of maths and practical skills. Paper 3 includes questions on a pre-release article. | Paper 1 33.3% weighting  2 hours 100 marks Covers half the A level topics and some AS content. Find out more | Paper 2 33.3% weighting  2 hours 100 marks Covers half the A level topics and some AS content. Find out more | Paper 3 33.3% weighting  2 hours 100 marks Covers all AS and A level topics. Find out more |
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New assessment of practical skills

A level is 100% externally assessed (no coursework)

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|  Core practicals appear in the specification content; practical-based questions are also in the exams. |  Teacher-assessed practical competency , based on core practical activities, reported alongside the A level grade. |
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Resources

In order to support your programme of study and revision, we have identified two resources that we feel would be the most effective to help them. These books are not essential for success but as most students find they are a real help, we thought this would be a good time to direct you to the most effective guides.

Available through the CPG Website:

Edexcel Biology A Level Complete Revision and Practice – ISBN 978 1 78294 298 6

Available from Waterstones and other online providers:

Salter Nuffield AS/A Level Biology Revision Workbook – ISBN 9781447992707

We are not able to provide a course textbook, although one will be available in lessons. We will provide access to a PDF version of the textbook or you might want to purchase your own copy.

Year 12

Salter-Nuffield AS/A level Biology Student Book 1 + ActiveBook (Salter-Nuffield Advanced Biology(2015)) ISBN-13 : 978-1447991007

Year 13

Salter-Nuffield A level Biology Student Book 2 + ActiveBook (Salter-Nuffield Advanced Biology(2015)) ISBN-13 : 978-1447991014

Reading list

In order to gain a genuine understanding of the topics covered it is essential that you read regularly and widely about your chosen field of study.

Magazines, Newspapers and journals.

New Scientist

Nature

Science

Biological Sciences Review

British Medical Journal

Any scientific articles in newspapers (eg the Guardian on Wednesday)

Books

There is no required reading material for students, but we recommend that you read regularly and select many different topics from a varied range of authors.

You may find the following books interesting and informative at a general level. A number of these are available from Mr Scarbrough's lab (401). It may also be possible to order them from the college library.

Richard Dawkins:

- The Selfish Gene
- The Blind Watchmaker.
- Unweaving the Rainbow
- Climbing Mount Improbable
- The Ancestor's Tale

Steve Jones:

- Y: The Descent of Men
- In the Blood: God, Genes and Destiny
- Almost Like a Whale: The 'Origin of Species' Updated
- The Language of the genes

Matt Ridley:

- Genome: The Autobiography of a Species in 23 Chapters
- The Red Queen: Sex and the Evolution of Human Nature
- The Language of Genes
- Francis Crick: Discoverer of the Genetic Code
- Nature Via Nurture: Genes, Experience and What Makes Us Human

James Watson:

- DNA: The Secret of Life
- The Double Helix: Personal Account of the Discovery of the Structure of DNA

Lewis Thomas:

- The Lives of a Cell: Notes of a Biology Watcher.
- The Medusa and the Snail: More Notes of a Biology Watcher Barry Gibb:
- The Rough Guide to the Brain (Rough Guides Reference Titles)

Charles Darwin: The origin of species

Armand Marie Leroi: Mutants: On the Form, Varieties and Errors of the Human Body

David S. Goodsell: The Machinery of Life

Ernst Mayr: This Is Biology: The Science of the Living World

George C. Williams: Plan and Purpose in Nature

Steve Pinker: The Language Instinct

Edward O Wilson: The Diversity of Life

Primo Levi: The Periodic Table

Richard Leaky: The Origin of Humankind

Bill Bryson: A Short History of Nearly Everything

TV and radio

There is a whole host of programmes dedicated to deepening our understanding of the world around us. These are just a few recommendations and can be downloaded as podcasts or listened to live on the radio or watched on TV:

[The infinite Monkey Cage](#) – BBC Radio 4

[Inside Science](#) - BBC Radio 4

[Natural Histories](#) – BBC Radio 4

[The life scientific](#) – BBC Radio 4

BBC – [Science and Nature](#)

A Level Biology

Summer Preparation

As well as the presentation we have asked you to prepare, you have been given a GCSE transition document.

This provides you with a summary of the information from your GCSE studies that is most directly related to your new studies for A level and some preparation work.

We suggest that in the week before term starts in September you spend some time going over this material and working through the questions. It will allow you to get a flying start to your new studies.

However, it is the presentation that we want you to make sure that you prepare. You will have to present this in your first few lessons in September and its quality will be the first measure your A level teacher has of you.

Enjoy your summer break – come back refreshed and ready to work hard!