

You're studying A-Level Biology, congratulations! Now let's change the world!

Studying biology after your GCSEs really develops your critical thinking, practical skills and knowledge of the world around you. If you enjoy learning about the human body, nature and experimenting in the lab, you'll love this course.

To begin with, you may find the jump in demand from GCSE a little daunting, but if you follow the tips and advice given by your teachers, you'll soon adapt.

We recommend you keep this somewhere safe, as you may like to refer to the information inside throughout your studies.

Why study A-Level Biology?

Biology students get to investigate a huge range of topics and ideas: the big question you'll ask yourself is 'how do living things work'? If you choose it as a career, you have the potential to help solve many of the world's problems. You could work on a cure for disease, help solve global warming, help with the world's biodiversity crisis: the possibilities are endless.

Even if you don't decide to work in biology, studying it develops useful and transferable skills for other careers. You'll develop research, problem solving and analytical skills, alongside teamwork and communication. Universities and businesses regard all of these very highly.

Possible degree options

There are many different degree options for students with Biology A Level. Here are some examples:

- Medicine
- Biology
- Ecology
- Biomedical science
- Pharmacy
- Sports science
- Nursing
- Forensic science
- Dentistry
- Veterinary medicine

What career appeals to you?

As with degree options, there are many different career opportunities too. Biological science is undergoing revolutionary change and advancement. Students entering the field now, really do have a chance to change the world.

- research scientist
- doctor
- biomedical scientist
- synthetic biologist
- computational biologist
- ecologist
- agriculturalist
- fisheries scientist
- toxicologist
- epidemiologist
- virologist
- environmental consultant
- higher education lecturer or secondary school teacher
- science journalist or communicator

Specification at a glance: Edexcel Biology A (Salters-Nuffield) 2015 (9BN0)

Topic 1 Lifestyle, health and risk

- Physiology of the heart
- Practical investigation of heart structure
- Physiology of blood vessels
- Blood clotting
- Water as a biological molecule
- Sugars as biological molecules
- Lipids as biological molecules
- Heart disease and cholesterol
- Atherosclerosis
- Hypertension
- Energy budgets and risk factors
- Clinical study design and data
- Investigating caffeine
- Investigating vitamin C content

Topic 2 Genes and health

- Physiology of cystic fibrosis sufferers
- Gas exchange surfaces
- Diffusion, osmosis, and active transport
- Fluid mosaic model of membranes
- Proteins as biological molecules
- Protein synthesis
- The genetic code
- DNA replication
- Mutation
- Genetic screening
- Investigating membrane permeability
- Investigating enzymes

Topic 3 Voice of the genome

- Prokaryotes and eukaryotes
- Eukaryotic cell structure
- Interpreting electron microscope images
- DNA as a biological molecule
- Gamete structure and function
- Fertilisation
- Meiosis and inheritance
- Sex-linked inheritance
- Polygenic inheritance
- Mitosis and the cell cycle
- Stem cells
- Gene expression
- Epigenetics
- Understanding cancer
- Observation of mitosis

Topic 4 Biodiversity

- The species concept
- The biodiversity concept
- Classification and phylogeny
- Genetic diversity
- Conservation strategies
- Ecological ideas
- Evolution and natural selection
- Speciation
- Hardy-Weinberg equation
- Plant cell structures
- Plant polysaccharides
- Fundamental microbiology
- Drug development
- Identifying plant tissues
- Investigating plant fibres
- Investigating plant antimicrobials

Topic 5 On the wild side

- Fundamental ecology
- Sustainability and human demand
- Photosynthesis reaction
- Photosynthesis structures
- Photosynthesis biochemistry
- Photosynthesis products
- Climate change
- Modelling and extrapolation
- Carbon cycling
- Allopatric and sympatric speciation
- Enzymes as biological molecules
- Ecological surveys
- Investigating chloroplasts
- Investigating enzymes
- Investigating homeostasis

Topic 6 Immunity and forensics

- Forensic biology methods
- DNA profiling
- PCR and gel electrophoresis
- Bacterial cell structure
- Virus structure
- Transmission of disease
- Tuberculosis case study
- HIV case study
- Antibiotics and antiretrovirals
- Antibiotic resistance
- Non-specific immunity
- Specific immunity
- Vaccination
- mRNA splicing
- Investigating antibiotics

Topic 7 Run for your life

- Joint structure and function
- Muscle structure
- Sliding filament theory
- Muscle fibre types
- Exercise and health
- Performance enhancement
- Respiration equation
- Respiration structures
- Respiration biochemistry
- Cardiac output and control of heart rate
- Ventilation and control of breathing
- Homeostatic control systems
- Hormones
- Investigating exercise and respiration

Topic 8 Grey matter

- Nervous system organisation
- Neurone structure
- Neurone function
- Receptors
- Synapses
- Coordination in plants
- Coordination in animals
- Brain structure
- Brain development
- Neuroscience techniques
- Animal behaviour
- Neurotransmitter malfunction
- Parkinson's disease case study
- Depression case study
- Genetic sequencing
- Genetic modification
- Investigating habituation

The assessment for A Level Biology consists of three exams

Paper 1: The Natural Environment and Species Survival		Paper 2: Energy, Exercise and Co-ordination	
		*Paper code: 9BN0/02	
<ul style="list-style-type: none"> Externally assessed Availability: May/June First assessment: 2017 	33.33% of the total qualification	<ul style="list-style-type: none"> Externally assessed Availability: May/June First assessment: 2017 	33.33% the total qualification
Overview of content This paper will examine the following topics: <ul style="list-style-type: none"> Topic 1: Lifestyle, Health and Risk Topic 2: Genes and Health Topic 3: Voice of the Genome Topic 4: Biodiversity and Natural Resources Topic 5: On the Wild Side Topic 6: Immunity, Infection and Forensics. 		Overview of content This paper will examine the following topics: <ul style="list-style-type: none"> Topic 1: Lifestyle, Health and Risk Topic 2: Genes and Health Topic 3: Voice of the Genome Topic 4: Biodiversity and Natural Resources Topic 7: Run for your Life Topic 8: Grey Matter. 	
Overview of assessment <ul style="list-style-type: none"> Assessment is 2 hours. The paper consists of 100 marks. The paper may include multiple-choice, short open, open-response, calculations and extended writing questions. The paper will include questions that target mathematics at Level 2 or above (see <i>Appendix 6: Mathematical skills and exemplifications</i>). Overall, a minimum of 10% of the marks across the three papers will be awarded for mathematics at Level 2 or above. The paper will include questions that target the conceptual and theoretical understanding of experimental methods. 		Overview of assessment <ul style="list-style-type: none"> Assessment is 2 hours. The paper consists of 100 marks. The paper may include multiple-choice, short open, open-response, calculations and extended writing questions. The paper will include questions that target mathematics at Level 2 or above (see <i>Appendix 6: Mathematical skills and exemplifications</i>). Overall, a minimum of 10% of the marks across the three papers will be awarded for mathematics at Level 2 or above. The paper will include questions that target the conceptual and theoretical understanding of experimental methods. 	

Paper 3: General and Practical Applications in Biology	
*Paper code: 9BN0/03	
<ul style="list-style-type: none"> Externally assessed Availability: May/June First assessment: 2017 	33.33% of the total qualification
Overview of content <ul style="list-style-type: none"> This paper will include questions from topics 1-8. A scientific article will be pre-released on our website 8 weeks before the examination. 	
Overview of assessment <ul style="list-style-type: none"> Assessment is 2 hours. The paper consists of 100 marks. The pre-released scientific article will underpin one section of the paper. The paper will include synoptic questions that may draw on two or more different topics. The paper will include questions that target mathematics at Level 2 or above (see <i>Appendix 6: Mathematical skills and exemplifications</i>). Overall, a minimum of 10% of the marks across the three papers will be awarded for mathematics at Level 2 or above. The paper will include questions that target the conceptual and theoretical understanding of experimental methods. 	

In addition to the exams, there is also a Practical Endorsement which requires the successful completion of 18 practical experiments, undertaken throughout the two-year course.

Science Practical Endorsement**	
*Paper code: 9BN0/04	
<ul style="list-style-type: none"> Internally assessed and externally monitored by Pearson Edexcel. Availability: May/June First assessment: 2017 	
Overview of content The assessment of practical skills is a compulsory requirement of the course of study for A level biology. It will appear on all students' certificates as a separately reported result, alongside the overall grade for the qualification. Students must carry out a minimum of 12 practical activities which, together, meet the requirements of <i>Appendices 5b</i> (Practical skills identified for direct assessment and developed through teaching and learning) and <i>5c</i> (Use of apparatus and techniques) from the prescribed subject content. The practical activities prescribed in this specification (the "core practicals") provide opportunities for demonstrating competence in all the skills identified, together with the use of apparatus and techniques for each subject. However, students can also demonstrate these competencies in any additional practical activity undertaken throughout the course of study which covers the requirements of <i>Appendix 5c</i> .	
Overview of assessment Students' practical work will be assessed by teachers, using common practical assessment criteria (CPAC) that are consistent across exam boards. These criteria can be found on pages 48-49. Students who demonstrate the required standard across all the requirements of the CPAC will receive a 'pass' grade. Students may work in groups but teachers who award a pass to their students need to be confident of individual students' competence. The correct application of CPAC to students' work will be monitored through a system of visits to centres. These visits will be coordinated across the exam boards by JCQ, to ensure that all centres are visited regularly, although not necessarily in each science subject.	

Places to go for help

1. The Edexcel A Level Biology A (Salters-Nuffield) website is a good place to start.

Although these pages are aimed at teachers, you may find them useful too. Information includes:

- The specification – this explains exactly what you need to learn for your exams.
- Practice exam papers.
- Lists of command words and subject specific vocabulary – so you understand the words to use in exams.
- Practical handbooks explain the practical work you need to know.
- Past papers from the old specification. Some questions won't be relevant, but most will and will be useful practice.
- Maths skills support
- Web resources pages with links to other resources to support study.

2. Textbooks and revision guides

Obviously, the textbooks and revision guides directly related to this specification will be the most useful for this course. However, at this stage, any A Level Biology textbook will be useful. During lock down, spending a few pounds on a second-hand book from the internet might prove a shrewd investment.

3. TV – especially BBC iPlayer.

The BBC has been producing excellent science and natural history output for many years, either as 'popular science' or as education (BBC Bitesize Science area). Both of these sources will expand your science understanding considerably and without distortion.

4. YouTube

YouTube has thousand of biology videos. Just be careful to look at who produced the video and why, because some videos distort the facts. Check the author, date, and comments – these can help indicate whether the clip is reliable. If in doubt, ask your teacher.

5. Magazines and newspapers – online or physical

There are many online publications that cover science and biology related topics. Examples include, New Scientist, Focus and broadsheet newspapers such as The Independent and The Guardian.