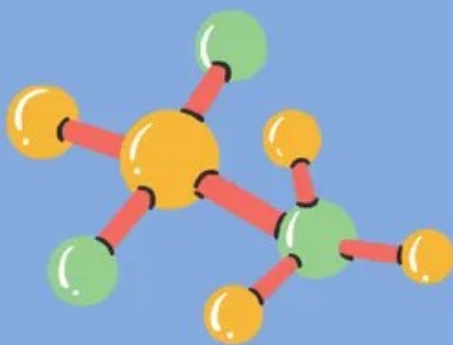




BIOLOGY

Student Handbook 2025



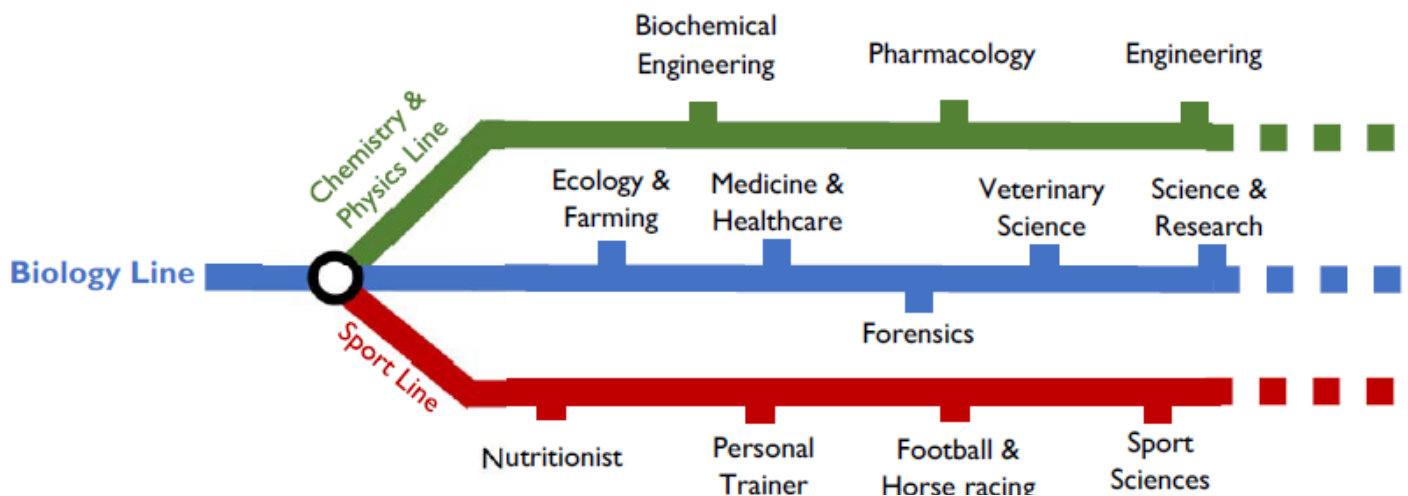
TOP BRIDGE



Is Biology the right subject for me?

- have an interest in, and enjoy biology and want to find out about how things work in the biological world by the application of imaginative, logical thinking
- want to use biology to progress onto further studies in Higher Education or support other qualifications or enter biology-based employment
- are taking A levels in the other sciences and/or mathematics or other relevant courses such as Physical Education and want to take another course that will support those studies.

Where can Biology take me?



Overview of Topics

We studying a plethora of Biology topics in A level Biology to ensure our students develop a key understanding in the many fields of Biology

What topics will I study?

- 1 Biological Molecules
- 2 Cells, Viruses and Reproduction
- 3 Classification and Biodiversity
- 4 Exchange and Transport
- 5 Energy for Biological Processes
- 6 Microbiology and Pathogens
- 7 Modern Genetics
- 8 Origins of Genetic Variation
- 9 Control Systems
- 10 Ecosystems



Biological Molecules introduces the molecules and ions essential to the structure and physiology of living organisms, including DNA and enzymes.

Cells, Viruses and Reproduction considers the ultrastructure of cells and viruses, as well as how cells are produced by cell division. Reproduction in plants and animals are also studied.

Classification and Biodiversity considers the development of models for classifying organisms, along with their limitations. The topic also includes the principles of natural selection and speciation.

Exchange and Transport considers transport mechanisms in cells, the circulatory system in mammals and the vascular system in plants.

Energy for Biological Processes deals with sources of energy in living organisms (respiration and photosynthesis) and how energy transfers take place.

Microbiology and Pathogens covers how some microorganisms act as pathogens and how the human body responds to infection. Techniques for studying microorganisms in the laboratory are also featured.

Modern Genetics builds on knowledge of DNA to consider how genes are expressed. Epigenetics and stem cells are both studied in this topic.

Origins of Genetic Variation considers inheritance of genes (linked and unlinked) and alleles.

Control Systems concerns the processes of chemical and nervous coordination in plants and animals, with emphasis on the brain, vision, and the roles of the heart and kidney.

Ecosystems considers interactions between organisms and the environment, and how ecosystems develop over time especially when influenced by human activity.

How is the course assessed?

Biology 'B' is examined, at A level, by three written exam papers. You will also undertake a range of practical activities through the Core Practicals leading to a separate award: the Practical Endorsement.

- Exam questions will test students' knowledge and understanding of the relevant specification topics.
- Paper 3 will also test students' investigative skills, based on core practicals in the specification.
- Question types: multiple choice, short and long answer questions (up to 9 marks), and calculations.
- Questions assessing students' use of mathematical skills will make up 10% of the exam papers.

Paper 1 – Advanced Biochemistry, Microbiology and Genetics

✓ 90 marks

⚖️ 30% weighting

🕒 1 hour 45 minutes

- Topic 1: Biological Molecules
- Topic 2: Cells, Viruses and Reproduction of Living Things
- Topic 3: Classification and Biodiversity
- Topic 4: Exchange and Transport
- Topic 5: Energy for Biological Processes
- Topic 6: Microbiology and Pathogens
- Topic 7: Modern Genetics

Paper 2 – Advanced Physiology, Evolution and Ecology

✓ 90 marks

⚖️ 30% weighting

🕒 1 hour 45 minutes

- Topic 1: Biological Molecules
- Topic 2: Cells, Viruses and Reproduction of Living Things
- Topic 3: Classification and Biodiversity
- Topic 4: Exchange and Transport
- Topic 8: Origins of Genetic Variation
- Topic 9: Control Systems
- Topic 10: Ecosystems

Paper 3 – General and Practical Principles in Biology

✓ 120 marks

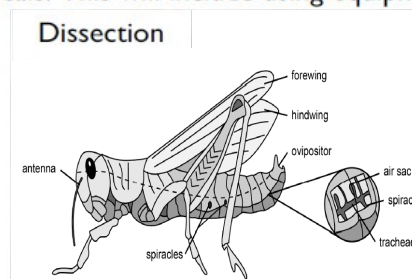
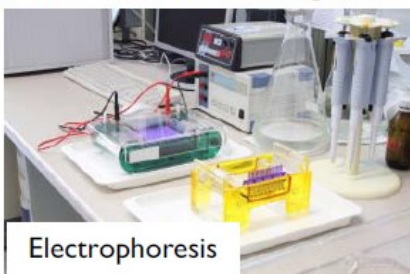
⚖️ 40% weighting

🕒 2 hours 30 minutes

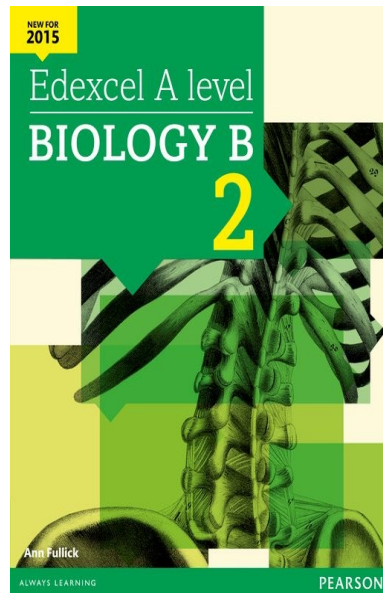
- All topics across the full A level specification.
- Half of the paper will focus on testing students' knowledge and understanding of practical skills and techniques.

Practical Endorsement

This is separate to the exams and is based on your competency in completing practical work throughout the course. This can be assessed using 16 core practicals. This will include using equipment and techniques such as:

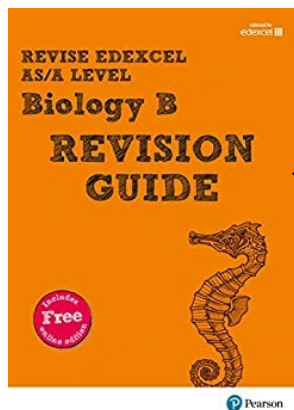


Supporting your individual study



You will be loaned two
A Level textbooks for study in
Years 1 and 2 .

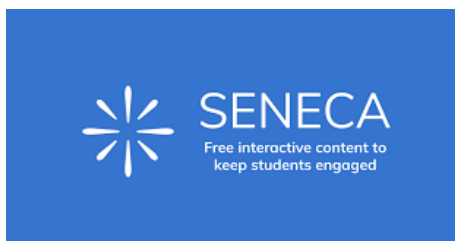
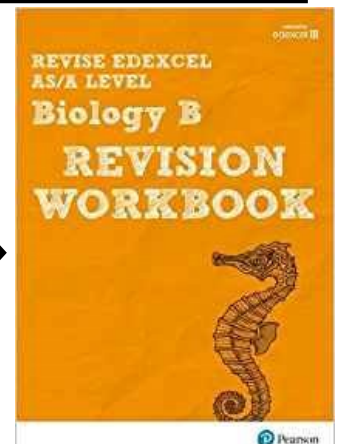
*These will be returned to us
at the end of your study*



Use your revision guide to read through the work
covered in lessons as well as read ahead so you
arrive at lessons prepared.

This will be returned to us at the end of your study

The workbook is a super tool to test your
understanding following each lesson.
You can then self assess your work using the mark
scheme at the back

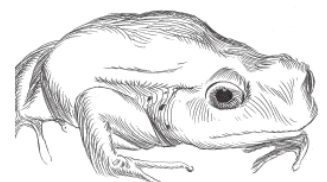


Assessments will be set regularly on Seneca to
help you with your recall. The online platform
will also give instant feedback on areas you are
struggling with

In addition:

We will provide you with :

- ◇ a topic booklet for each topic which includes what will be taught, the practical's, end point tasks and learning check lists
- ◇ Revision packs
- ◇ Past exam paper practice
- ◇ Regular end of module testing
- ◇ Practical Endorsement folder



Research activity

A Level Biology will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas.

Complete the following tasks to make sure your knowledge is up to date and you are ready to start studying in September.

DNA and the Genetic Code

In living organisms nucleic acids (DNA and RNA) have important roles and functions related to their properties. The sequence of bases in the DNA molecule determines the structure of proteins, including enzymes.

The double helix and its four bases store the information that is passed from generation to generation. The sequence of the base pairs adenine, thymine, cytosine and guanine tell ribosomes in the cytoplasm how to construct amino acids into polypeptides and produce every characteristic we see. DNA can mutate leading to diseases including cancer and sometimes anomalies in the genetic code are passed from parents to babies in disease such as cystic fibrosis, or can be developed in unborn foetuses such as Down's Syndrome.

Read the information on these websites (you could make more Cornell notes if you wish):

<http://www.bbc.co.uk/education/guides/z36mmp3/revision>

<http://www.s-cool.co.uk/a-level/biology/dna-and-genetic-code>

And take a look at these videos:

<http://ed.ted.com/lessons/the-twisting-tale-of-dna-judith-hauck>

<http://ed.ted.com/lessons/where-do-genes-come-from-carl-zimmer>



Task:

Produce a wall display to put up in your classroom in September. You might make a poster or do this using PowerPoint or similar. Your display should use images, keywords and simple explanations to:

Define gene, chromosome, DNA and base pair

Describe the structure and function of DNA and RNA

Explain how DNA is copied in the body

Outline some of the problems that occur with DNA replication and what the consequences of this might be.

Evolution

Transfer of genetic information from one generation to the next can ensure continuity of species or lead to variation within a species and possible formation of new species. Reproductive isolation can lead to accumulation of different genetic information in populations potentially leading to formation of new species (speciation). Sequencing projects have read the genomes of organisms ranging from microbes and plants to humans. This allows the sequences of the proteins that derive from the genetic code to be predicted. Gene technologies allow study and alteration of gene function in order to better understand organism function and to design new industrial and medical processes.

Read the information on these websites (you could make more Cornell notes if you wish):

<http://www.bbc.co.uk/education/guides/z237hyc/revision/4>

<http://www.s-cool.co.uk/a-level/biology/evolution>

And take a look at these videos:

<http://ed.ted.com/lessons/how-to-sequence-the-human-genome-mark-j-kiel>

<http://ed.ted.com/lessons/the-race-to-sequence-the-human-genome-tien-nguyen>



Task:

Produce a one page revision guide for an AS Biology student that recaps the key words and concepts in this topic. Your revision guide should:

Describe speciation

Explain what a genome is

Give examples of how this information has already been used to develop new treatments and technologies.