BEECHEN CLIFF

A Level Biology

Curriculum Booklet

2026 - 2027

Head of Faculty: Ms R Bala

Head of Subject: Mrs E Angel

Subject Curriculum Intent:

"Biology is the study of complicated things that have the appearance of having been designed with a purpose."

Richard Dawkins

Biology is a fascinating subject that is incredibly relevant. If you are prepared to ask difficult questions and are inquisitive about the world around you, you will love Biology. At Beechen Cliff we are incredibly passionate about the subject and offer a challenging course with high aspirations for our students. Our intention is that having studied with us our students will;

- develop a deep and comprehensive knowledge of the core concepts within Biology,
- develop strong mathematical and analytical skills,
- be able to apply their knowledge and skills to a wide range of problems,
- develop the necessary practical skills and experiences needed to confidently investigate biological concepts
- be able to confidently articulate their understanding,
- develop an awareness of the many interesting and varied career opportunities within the field,
- be fully equipped to continue to study or to work in the field beyond A level at any institution they desire.

We follow the OCR A A level biology specification and our course builds on the knowledge and skills gained at GCSE and allows students to develop a rich knowledge and understanding of Biology that will allow them to access a range of undergraduate courses.

In the lower sixth, we begin by teaching the "foundations in Biology" module where students will study cells, biological membranes, biological molecules, enzymes and cell division. They will then move on to study exchange and transport systems along with biodiversity, evolution and disease. Then finally they will focus on ecosystems and populations

In the Upper Sixth, they will continue to build on the knowledge and skills they have gained and will work on more advanced concepts, which include bioenergetics, homeostasis, communication, responses, biotechnology, genetics and gene technology. It is the intention that practical and analytical skills are developed throughout the course. We have excellent practical facilities and have included a wide range of practical opportunities that exceed the requirements set by exam boards. We also visit university laboratories and take field trips, ensuring that our students have a rich experience working scientifically.

Many of our students have achieved high grades at GCSE (a 6 in Biology or Combined Science is required) and our course provides a challenge to all students sparking curiosity and encouraging students to develop a breadth and depth of knowledge. Each year we have students applying to university to study Biology but also courses such as medicine and veterinary science and we strongly believe that the course allows students to access a wide range of further education opportunities.

Subject Curriculum Implementation:

Students study the "OCR A" A level Biology course. Classes are mixed ability and all classes are taught by 2 specialist teachers. This ensures that they experience a wide range of skills and expertise. There are 6 modules of learning as follows.

Module	**Year**
Module 1: Practical Skills	This module is taught throughout the two years
Module 2: Foundations of biology Module 3: Exchange and transport Module 4: Biodiversity, Evolution and Disease	Covered in Year 12. Module 2 is taught by both teachers. Modules 3 and 4 are taught by one teacher.
Module 6: Genetics, Evolution and Ecosystems	This module is begun at the end of Year 12 and completed in the first part of Year 13.
Module 5: Communication, Homeostasis and Energy	This module is taught in Year 13.

Students begin by studying a " foundations in Biology" module at the beginning of year 12. This provides students with the basis to build upon and study areas in more detail, in year 12 they then move on to study exchange and transport and biodiversity, evolution and disease. At the end of year 12 they begin work on " year 2 content" by covering the Ecosystems component of module 6, this allows for fieldwork and also more time for consolidation at the end of year 13 prior to final assessments. In year 13 they study communication, homeostasis, bioenergetics, genetics, and evolution. These topics are carefully sequenced and to ensure knowledge is built over time and concepts revisited. To ensure that all pupils reach their potential, support materials and challenge tasks are provided in lessons as well as revision materials and in year 13 extra revision sessions.

We use regular knowledge quizzes as well as termly formal assessments to check what pupils know and provide verbal and written feedback to ensure that any gaps in knowledge are filled and that they know how to improve. The students carry out practical assessment activities that allow them to develop practical skills and enhance their understanding. All students have access to the online textbook to aid their studies and there is a Biology website to help students with their studies. In addition the google classroom is used to provide useful resources as we work through the course.

Allocated Curriculum Time:

	Lower Sixth	**Upper Sixth**
Fortnightly lesson allocation	8	8

Course Information

Exam Board: OCR
Specification: H420

Lower Sixth

Term	Curriculum Foci Areas	Assessment
1	**(Module 2) Cell structure** • Microscopy • Magnification and calibration • Eukaryotic cell structure • Prokaryotic cell structure **(Module 2) Biological Molecules (continued into term 2)** • Biological elements • Structure function and testing of Carbohydrates, lipids and proteins • Nucleic acids and DNA replication • Protein synthesis • Structure and properties of ATP **(Module 2) Cell Membranes (continued into term 2)** • Structure and functions of membrane within and surrounding cells • Methods of transport across membranes	**Practical activity assessments** **Term 1 Assessment - cell structure and biological molecules**
2	**(Module 2) Enzymes** • How enzymes work • Factors affecting enzyme activity **(Module 2) Cell division** • Cell cycle • Cell division by meiosis and mitosis • Specialisation of cells • Stem cells **Key Assessments/Deadlines** • Module 2 assessment to take place at the end of term	**Practical activity assessments** **Term 2 assessments** • **Biological membranes** • **enzymes**
3	**(Module 4) Classification and evolution** • The hierarchy of classification systems • The study of phylogeny • evidence for evolution • adaptations and variation	**Practical activity assessments** **Term 3 assessment - mid term assessment all module 2 content**

	(Module 4) Biodiversity (continued in term 4) • factors affecting biodiversity • calculating biodiversity • maintaining biodiversity • sampling techniques **(Module 3) Exchange surfaces** • structure and function of the mammalian gas exchange system • ventilation and gas exchange in insects and fish **(Module 3) Transport in Animals (continued into term 4)** • structure and function of circulatory systems in insects, fish and mammals • structure and functions of blood, tissue fluid and lymph • structure and function of the heart	
4	**(Module 4) Communicable diseases,disease prevention and the immune system** • pathogens and communicable disease • defence against disease • the role of the immune system • preventing and treating disease **(Module 3)Transport in plants** • Transport of water in plants • plant adaptations to water availability • transport of assimilates by translocation	**Practical activity assessments** **Term 4 assessments** • **Gas exchange** • **classification**
5	**Consolidation and assessment of AS topics** • this term we will consolidate learning of the topics covered so far and carry out additional pag work as required to allow students to achieve the practical endorsement **Key Assessments/ Deadlines** • 2 full assessment papers "breadth in Biology" and "depth in Biology" to take place during year 12 exam week	**Practical activity assessments** **Term 5 assessments** • **Disease** • **Transport in animals**
6	**(Module 6) Ecosystems** • the influence of biotic and abiotic factors on ecosystems • recycling within ecosystems	**Practical activity assessments - to include extended research task**

	• The process of succession **(Module 6) Populations and sustainability** • factors affecting the size of populations • The importance of conservation and preservation • How ecosystems can be managed sustainably	**Term 6 assessment - - full as paper covering modules 2,3 and 4**

Upper Sixth

Term	Curriculum Foci Areas	Assessment
1	**(Module 6) Cellular control** • causes and effects of mutations and variation • how gen expression is controlled • the development of body plans **(Module 6) Patterns of Inheritance (continued into term 2)** • how genetic and environmental factors contribute to variation within populations • how changes in population genetics can lead to evolution, extinction and speciation • the principles of artificial selection and the ethical issues associated **(Module 6) Manipulating genomes** • the process of DNA profiling • the process of DNA sequencing • the process of genetic engineering • understanding gene technology and the ethical issues associated **(Module 6) Cloning and Biotechnology (continued into term 2)** • natural and artificial cloning • microorganisms and biotechnology • culturing microorganisms • using immobilised enzymes	Practical activity assessments Term 1 assessment -covers as content and a2 ecology content (modules 1,2,3,4 and part of 6)
2	**(Module 5) Hormonal Communication** • structure and function of the adrenal organs with a key focus on the pancreas • control of blood sugar and diabetes • control of the heart rate • the coordination of responses to increase survival	Practical activity assessments Term 2 assessment - paper 2 mock - Modules 1,2,4 and 6

	(Module 5) Photosynthesis • the process of photosynthesis and factors affecting it • the synthesis of ATP **Key Assessments/ Deadlines** • Biology mock paper 2 exam - this covers modules 1,2,4 and 6	
3	**(Module 5)Neuronal Communication** • Structure and organisation of the nervous system • transmission of nerve impulses • the structure and function of synapses • structure and function of the brain • structure and function of muscles **(Module 5)Plant responses (continued in term 4)** • The role of plant hormones • tropisms in plants • plant responses to stress **(Module 5)Respiration** • The stages of aerobic respiration • the process of anaerobic respiration • respiratory substrates **(Module 5)Homeostasis (continued in term 4)** • the principles of homeostasis • thermoregulation in endotherms and ectotherms • the role of the liver and excretion • the structure and function of the kidneys and osmoregulation	Term 3 assessment "flashback" module 3 content
4	**Complete module 5 topics** **Consolidation** • we will consolidate learning of the topics covered so far and carry out additional pag work as required to allow students to achieve the practical endorsement	Term 4 assessment - full paper 3 exam covering all taught content from the specification full paper 1 covering modules 1,2,3 and 5
5	**Revision and Exams** • Students will take 2 further "mock" assessments - Paper 1 which covers modules 1,2,3,and 5 and paper 3 which assesses all areas of the specification	Term 5 assessment - full paper 3 exam covering all taught content from the specification
6	**Exams**	

Required Reading/ textbooks

Textbook

A Level Biology for OCR year 1 and 2 student book - students to purchase - available through the school

Published by CGP
ISBN 978183774137

A Level Biology A for OCR Student Book - online version provided

Series Editor **Ann Fullick**, Author **Ann Fullick**, Author **Jo Locke**, and Author **Paul Bircher**

ISBN: 978-0-19-835192-4

Optional reading

Magazines, Newspapers and journals

New Scientist, Scientific American, Nature,any scientific articles in newspapers

Websites

- http://www.ibiblio.org/virtualcell/index.htm
- http://www.dnai.org/a/index.html
- http://nobelprize.org
- http://nature.com
- http://royalsociety.org
- http://www.nhm.ac.uk
- http://www.bmj.com
- http://www.bbc.co.uk/news/science_and_environment

Books

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

Studying / Revision Information

Ongoing Studying
After each lesson you should use the online textbook/ the biology website/ resources provided on the google classroom to consolidate your learning

Regular homeworks will be set to either consolidate learning or to allow "flipped learning" so consolidation can take place in class.

It is expected that for every hour in lessons, students will spend an hour then either completing hw or consolidating knowledge or reading around the subject. That is 4 hours of study per week outside of lessons.

Revision
In order to prepare for assessments, students should use checklists to ensure all relevant content has been learned. In addition the use of questions to consolidate learning is vitally important, these should be both retrieval of knowledge questions and past paper questions. There are some useful resources below and additional resources will be provided on the google classroom

Useful resources

- A Level Biology A for OCR Student Book -Series Editor Ann Fullick, Author Ann Fullick, Author Jo Locke, and Author Paul Bircher
- CGP, New A level Biology:OCR year 1 and 2 complete revision and practice
- Oxford Revise: A Level Biology for OCR A Revision and Exam Practice by Andrew Chandler-Grevatt, Deborah Shah-Smith, Michael Fisher, Robert Brook, Rachel Wong
- Beechen Cliff Biology Website - this has links to further useful sites and revision resources and is regularly updated - https://beechencliffschoolbiology.weebly.com/

Final Assessment Structure:

Component	Weighting (%)	Content	Proposed Examination Date
Biology Paper 1	37	• Module 1 • Module 2 • Module 3 • Module 5	May/June
Biology paper 2	37	• Module 1 • Module 2 • Module 4 • Module 6	May/June
Biology paper 3	26	• Unified Biology - all topics covered	May/June
Practical endorsement	Reported separately	12 key practical areas assessed	Assessed throughout the course

Please see Exam Board websites for up to date information:
https://www.ocr.org.uk/qualifications/as-and-a-level/biology-a-h020-h420-from-2015/

Careers in the Curriculum

Everything around you can be related back to Science, and A level Biology applies itself to all careers. The transferrable skills acquired in Biology are highly regarded among many employers, including banks and even the government. More conventional career paths following Biology A level include scientific research, medicine, nursing, pharmacology and teaching.

Year	Careers Education in Science
12	• Module 4 links to work in the field of ecology • Module 3 links to careers in medicine, e.g. diagnosing and explaining circulatory and respiratory disease • Ignite day activities • Extra curricular opportunities
13	• Conservation research project • Genetic technology and biotechnology links to careers • Plant hormone work links to agriculture and horticulture

Careers links

The links below give a wide range of information about possible careers in Biology:

- An A to Z list of possible biology careers in video format https://www.youtube.com/playlist?list=PLxu6ICEq35PdofbM5lOz9mUSv63q5BJ7Q

- Royal Society of Biology careers information booklet https://www.rsb.org.uk/images/Spotlight_on_the_Life_Sciences_-_A_Guide_to_Biology_Careers.pdf

- CEC resource with information about a range of career opportunities https://resources.careersandenterprise.co.uk/sites/default/files/2022-08/1558_My%20Learning%20My%20Future_Biology_completed.pdf