
AS AND A LEVEL BIOLOGY

Switching from OCR to Edexcel B

This document is designed to help you compare the existing 2008 OCR Biology specification (H421) with the new 2015 Edexcel Biology B specification.

The document gives an overview, at the topic level, of where the material covered in the existing OCR Biology specification can be found in the new Edexcel Biology B specification. The following tables then give a more detailed breakdown of the Edexcel specification, and highlight areas of difference. These will help you see where material that you currently teach in the OCR specification is not present in the Edexcel specification; or where the Edexcel specification incorporates material that is new to you.

As a general overview, the 2015 Edexcel Biology B specification is split into ten topics. At AS, these topics are: Biological Molecules; Cells, Viruses & Reproduction of Living Things; Classification & Biodiversity; and Exchange & Transport. In the second year of the A level, the topics are: Energy for Biological Processes; Microbiology & Pathogens; Modern Genetics; Origins of Genetic Variation; Control Systems; and Ecosystems.

Our new Edexcel Biology B is a brand-new course, built around a combination of traditional and modern topics. As with all our A levels, we've considered issues of progression from GCSE when putting the specification together; and we've worked with universities to ensure that the content provides a good platform for further study in biology, or related disciplines.

As well as great biology within the specification, there are other ways in which we can help support your teaching on our new A level Biology B specification. Our free support includes:

- additional sets of question papers
- Results Plus, now with Mock Analysis service
- Exam Wizard, our online bank of past paper questions
- Getting Started Guides, with course planners
- "Getting Ready to Teach" events
- documents to help deliver the mathematics and practical aspects of the specification
- worksheets for each "core practical" in the specification

Overview of content

OCR (2008)	Edexcel B (2015)
1.1.1 Cell Structure	Topic 2.1 Eukaryotic and prokaryotic cell structure and function
1.1.2 Cell Membranes	Topic 4.2 Cell transport mechanisms
1.1.3 Cell Division, Cell Diversity, Cellular Organisation	Topic 2.3 Eukaryotic cell cycle and division
1.2.1 Exchange Surfaces and Breathing	Topic 4.3 Gas exchange
1.2.2 Transport in Animals	Topics 4.4 Circulation 4.5 Transport of gases in the blood 4.6 Transfer of materials between circulatory system and cells
1.2.3 Transport in Plants	Topic 4.7 Transport in Plants
2.1.1 Biological Molecules	Topics 1.1 Carbohydrates 1.2 Lipids 1.3 Proteins
2.1.2 Nucleic Acids	Topic 1.4 DNA and protein synthesis
2.1.3 Enzymes	Topic 1.5 Enzymes
2.2.1 Diet and Food Production	Topic 4.4 <i>Development of atherosclerosis only</i>
2.2.2 Health and Disease	Topics 6.2 Bacteria as pathogens 6.5 Other pathogenic agents 6.7 Response to infection
2.3.1 Biodiversity	Topic 3.3 Biodiversity
2.3.2 Classification	Topic 3.1 Classification
2.3.3 Evolution	Topic 3.2 Natural Selection
2.3.4 Maintaining Biodiversity	Topic 3.3 Biodiversity
4.1.1 Communication	Topic 9.1 Homeostasis Topic 9.9 (part) Osmoregulation and temperature regulation
4.1.2 Nerves	Topic 9.5 Nervous transmission
4.1.3 Hormones	Topic 9.2 Chemical control in mammals
4.2.1 Excretion	Topic 9.9 (part) Osmoregulation and temperature regulation
4.3.1 Photosynthesis	Topics 5.6 Photosynthetic pigments 5.7 Photosynthesis
4.4.1 Respiration	Topics 5.1 Aerobic respiration 5.2 Glycolysis 5.3 Link reaction and Krebs cycle 5.4 Oxidative phosphorylation 5.5 Anaerobic respiration
5.1.1 Cellular control	Topic 1.4 DNA and protein synthesis
5.1.2 Meiosis and variation	Topics 2.3 Eukaryotic cell cycle and division 8.1 Origins of genetic variation 8.2 Transfer of genetic information 8.3 Gene pools
5.2.1 Cloning Plants and Animals	not included
5.2.2 Biotechnology	Topic 6.1 Microbial Techniques
5.2.3 Genomes and Gene Technologies	Topic 7.4 Gene technology
5.3.1 Ecosystems	Topics 10.1 The nature of ecosystems 10.2 Energy transfer through ecosystems 10.3 Changes in ecosystems,
5.3.2 Populations and Sustainability	Topics 10.3 Changes in ecosystems 10.4 Human effects on ecosystems
5.4.1 Plant Responses	Topic 9.3 Chemical control in plants
5.4.2 Animal Responses	Topic 9.4 Structure and function in the nervous system
5.4.3 Animal Behaviour	Not included

In-depth comparison

Edexcel B (2015)	OCR (2008)	What's new for you	What do you no longer teach
Topic 1 Biological molecules	Covers material from: 2.1.1, 2.1.2 5.1.1	1.1 Amylopectin 1.4 Now includes full details of protein synthesis as a required part of an AS unit 1.4 Details of gene mutations 1.6 Named inorganic ions	Although tests for biological molecules are not named here, they are a requirement for practical skills and this would be an obvious place to introduce them.
Topic 2 Cells, Viruses and Reproduction of living things	Covers material from: 1.1.1, 1.1.3	2.1 Distinguish between Gram positive and Gram negative bacterial cell walls and their reaction to antibiotics 2.2 Viral structure and reproduction; difficulties in treating viral infections; ethical implications of using untested drugs during epidemics 2.3 Chromosomal mutations and the origins of Down's and Turner's syndromes 2.4 Gametogenesis, fertilisation and early embryo development in mammals 2.5 Gametogenesis, fertilisation in angiosperms	
Topic 3 Classification and biodiversity	Covers material from: 2.3.1, 2.3.2, 2.3.3 5.1.2, 5.2.3	3.1 Use of gel electrophoresis to determine evolutionary relationships; greater emphasis on the evidence for the domain model; use of this context to discuss the role of the scientific community in validating new evidence 3.2 Concept of niche; idea of an evolutionary race between pathogens and medical science	2.3.2 Random sampling covered in a different context; estimates of global biodiversity; use of a dichotomous key 2.3.3 Evolution of pesticide resistance 2.3.4 Benefits of agriculture; significance of environmental impact assessments Note discussions of human effects on the environment are in Topic 10.3

Topic 4 Exchange and Transport.	Covers material from: 1.1.2, 1.2.1, 1.2.2, 1.2.3 2.2.2	4.2 Calculations of water potential may be set 4.3 Details of gas exchange in insects and fish 4.4 Erythrocytes and leucocytes; details of ATP molecule and function (now in AS units) 4.4 Cascade of reactions leading to clotting of the blood 4.5 Structure and function of myoglobin 4.6 Lymph system	1.1.2 Cell signalling 1.2.2 Interpret data from a spirometer; functions of cilia, goblet cells, smooth muscle and elastic fibres 1.2.3 Xerophytic adaptations of plants 2.2.2 Full details of immune response and vaccination (covered in Topic 6); effects of smoking on lungs and heart and evaluating evidence
Topic 5 Energy for Biological Processes	Covers material from: 4.3.1, 4.4.1	5.5 Effect of lactic acid produced by anaerobic respiration 5.6 Absorption and action spectra	4.4.1 Explain the different energy yields from different respiratory substrates
Topic 6 Microbiology and pathogens	Covers material from: 2.2.2, 2.3.3 5.2.2	6.1 Microbial techniques including different media, methods of measuring bacterial growth and isolation by streak plating 6.2 Bacteria as pathogens - exotoxins and endotoxins 6.3 Action of antibiotics 6.4 Development of antibiotic resistance; issues in controlling the spread of antibiotic resistance 6.5 Stem rust fungus in plants; influenza virus	2.2.2 Response of governments to new influenza strains; possible new sources of medicines 5.2.2 Biotechnology and food production; immobilised enzymes; continuous and batch culture; primary and secondary metabolites; manipulating fermentation vessels 5.2.3 Xenotransplantation
Topic 7 Modern genetics	Covers material from: 1.1.3 5.1.1, 5.2.3	7.1 DNA profiling 7.2 Transcription factors; post-transcription modification of mRNA; epigenetic modifications 7.3 Stem cells; iPS cells; 'knockout' mice 7.4 Genetic modification of soya bean	5.1.1 lac operon; homeobox sequences; apoptosis 5.2.1 Cloning (whole topic) 5.2.3 Production of human insulin and 'golden rice'; gene therapy
Topic 8 Origins of genetic variation	Covers material from: 2.3.3 5.1.1, 5.1.2	8.2 Autosomal linkage 8.3 Population bottlenecks; founder effect	2.3.3 Continuous and discontinuous variation

Topic 9 Control systems	Covers material from: 4.1.1, 4.1.3, 4.2.1 5.4.1	9.2 Mode of action of oestrogen 9.3 Actions and interactions of cytokinins, gibberellins and phytochrome in plants 9.5 Excitatory and inhibitory post synaptic potentials 9.6 Effects of nicotine, lidocaine and cobra venom on nervous transmission 9.7 Detection of light in humans 9.9 Role of pituitary and hypothalamus in osmoregulation; adaptations of desert animals	4.1.3 Regulation of blood sugar and diabetes 4.2.1 Kidney failure and dialysis; urine testing; functions of the pancreas 5.4.2 Coordination of muscle movement; neuromuscular junctions; voluntary, involuntary and cardiac muscle 5.4.3 Animal behaviour (whole topic)
Topic 10 Ecosystems	Contains material from: 5.3.1, 5.3.2	10.1 t-test and Spearman's Rank test 10.4 Conservation of fish stocks	5.3.2 Timber production; animal and plant populations on Galapagos Islands; predator -prey relationships