

AS level Biology Specification Comparison Document

| Exam Board | AQA | Edexcel | | OCR | | WJEC |
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| Specification Title (Sept 2015) | AS level Biology | AS level Biology A (Salters-Nuffield) | AS level Biology B | AS level Biology A | AS level Biology B (Advancing Biology) | AS Biology (Eduqas) |
| AS Level Units | Topic 1: Biological molecules Topic 2: Cells Topic 3: Organisms exchange substances with their environment Topic 4: Genetic information, variation and relationships between organisms | Topic 1: Lifestyle, Health and Risk Topic 2: Genes and Health Topic 3: Voice of the Genome Topic 4: Biodiversity and Natural Resources | Topic 1: Biological Molecules Topic 2: Cells, Viruses and Reproduction of Living Things Topic 3: Classification and Biodiversity Topic 4: Exchange and Transport | Module 1: Development of Practical skills in biology Module 2: Foundations in biology Module 3: Exchange and transport Module 4: Biodiversity, evolution and disease | Module 1: Development of practical skills in biology Module 2: Cells, chemicals for life, transport and gas exchange Module 3: Cell division, development and disease control | Component 1: Basic Biochemistry and Cell Organisation Component 2: Biodiversity and Physiology of Body Systems |
| AS Exams (summer 2016) | Paper 1: Topics 1-4 & practical skills 50% of AS Written paper 1hr 30 minutes 75 marks (65 marks short answer questions, 10 marks comprehension) | Paper 1: Lifestyle, Transport, Genes and Health, Topics 1&2 & practical skills 50% of AS Written paper 1hr 30 minutes 80 marks (multiple-choice, short open, open-response, calculations and extended writing questions) | Paper 1: Core Cellular Biology and Microbiology, Topics 1&2 & practical skills 50% of AS Written paper 1hr 30 minutes 80 marks (multiple-choice, short open, open-response, calculations and extended writing questions) | Paper 1: Breadth in Biology, Modules 1-4 (includes practical skills) 50% of AS Written paper 1hr 30 minutes 70 marks (Section A multiple choice questions, 20 marks. Section B short structured questions, problem solving, calculations, practical questions, 50 marks) | Paper 1: Foundations of Biology, Modules 1-3 (includes practical skills) 50% of AS Written paper 1hr 30 minutes 70 marks (Section A multiple choice questions, 20 marks. Section B short structured questions, problem solving, calculations, practical questions, 50 marks) | Paper 1: Component 1 Basic Biochemistry and Cell Organisation 50% of AS Written paper 1hr 30 minutes 75 marks (A range of short and longer structured compulsory questions) |
| | Paper 2: Topics 1-4 & practical skills 50% of AS Written paper 1 hr 30 minutes 75 marks (65 marks short answer questions, 10 marks extended response) | Paper 2: Development, Plants and the Environment, Topics 3&4 & practical skills 50% of AS Written paper 1hr 30 minutes 80 marks (multiple-choice, short open, open-response, calculations and extended writing questions) | Paper 2: Core Physiology and Ecology, Topics 3&4 & practical skills 50% of AS Written paper 1hr 30 minutes 80 marks (multiple-choice, short open, open-response, calculations and extended writing questions) | Paper 2 Depth in Biology, Modules 1-4 (includes practical skills) 50% of AS Written paper 1hr 30 minutes 70 marks (short structured questions, problem solving, calculations, practical and extended response questions) | Paper 2: Biology in Depth, Modules 1-3 (includes practical skills) 50% of AS Written paper 1hr 30 minutes 70 marks (short structured questions, problem solving, calculations, practical and extended response questions) | Paper 2: Component 2 Biodiversity and Physiology of Body Systems 50% of AS Written paper 1hr 30 minutes 75 marks (A range of short and longer structured compulsory questions) |
| Practical Work AS (examined through written paper) | 1: Investigation into the effect of a named variable on the rate of an enzyme-controlled reaction 2: Preparation of stained squashes of cells from plant root tips; set-up and use of an optical microscope to identify the stages of mitosis in these stained squashes and calculation of a mitotic index 3: Production of a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue 4: Investigation into the effect of a named variable on the permeability of cell-surface membranes 5: Dissection of animal or plant gas exchange system or mass transport system or of organ within such a system 6: Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth | 1: i) Investigate the effect of caffeine on heart rate in daphnia. ii) Discuss the potential ethical issues regarding the use of invertebrates in research. 2: Investigate the vitamin C content of food and drink. 3: Investigate membrane structure, including the effect of alcohol concentration or temperature on membrane permeability. 4: Investigate the effect of enzyme and substrate concentrations on the initial rates of reactions. 5: Prepare and stain a root tip squash to observe the stages of mitosis. 6: Identify sclerenchyma fibres, phloem sieve tubes and xylem vessels and their location within stems through a light microscope. 7: Investigate plant mineral deficiencies. 8: Determine the tensile strength of plant fibres. 9: Investigate the antimicrobial properties of plants, including aseptic techniques for the safe handling of bacteria. | 1: Investigate a factor affecting the initial rate of an enzyme controlled reaction. 2: Use of the light microscope, including simple stage and eyepiece micrometers and drawing small numbers of cells from a specialised tissue. 3: Make a temporary squash preparation of a root tip to show stages of mitosis in the meristem under the light microscope. 4: Investigate the effect of sucrose concentrations on pollen tube growth. 5: Investigate the effect of temperature on beetroot membrane permeability. 6: Determine the water potential of a plant tissue. 7: Dissect an insect to show the structure of the gas exchange system. 8: Investigate factors affecting water uptake by plant shoots using a potometer. | 1: Microscopy 2: Dissection 3: Sampling techniques 4: Rates of enzyme controlled reactions 5: Colorimeter OR potometer 6: Chromatography (OR Electrophoresis) (7: Microbiological techniques) 8: Transport in and out of cells 9: Qualitative testing (10: Investigation using a data logger OR computer modelling) (11: Investigation into the measurement of plant or animal responses) (12: Research skills) *All practical activities in brackets are covered in Year 2 of the full A Level only There are opportunities throughout the AS year to do practical work that can contribute to the Practical Endorsement at A level Module 1 covers all indirectly assessable practical skills that could be assessed in the AS | 1: Microscopy 2: Dissection (3: Sampling techniques) 4: Rates of enzyme controlled reactions 5: Colorimeter OR potometer 6: Chromatography (OR Electrophoresis) 7: Microbiological techniques 8: Transport in and out of cells 9: Qualitative testing (10: Investigation using a data logger OR computer modelling) (11: Investigation into the measurement of plant or animal responses) (12: Research skills) *All practical activities in brackets are covered in Year 2 of the full A Level only There are opportunities throughout the AS year to do practical work that can contribute to the Practical Endorsement at A level Module 1 covers all indirectly assessable practical skills that could be assessed in the AS | 1: Food tests to include: iodine-potassium iodide test for starch; Benedict's test for reducing and non-reducing sugars; Biuret test for protein; emulsion test for fats and oils 2: Calibration of the light microscope at low and high power, including calculation of actual size of a structure and the magnification of a structure in a drawing 3: Preparation and scientific drawing of a slide of living cells e.g. onion/ rhubarb/ Amoeba including calculation of actual size and magnification of drawing 4: Determination of water potential by measuring changes in mass or length 5: Determination of solute potential by measuring the degree of incipient Plasmolysis 6: Investigation into the permeability of cell membranes using beetroot 7: Investigation into the effect of temperature or pH on enzyme activity 8: Investigation into the effect of |

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| | | | | examinations. | examinations. | <p>enzyme or substrate concentration on enzyme activity</p> <p>9: Simple extraction of DNA from living material</p> <p>10: Scientific drawing of cells from slides of root tip to show stages of mitosis</p> <p>11: Scientific drawing of cells from prepared slides of developing anthers to show stages of meiosis</p> <p>12: Investigation into biodiversity in a habitat</p> <p>13: Investigation into stomatal numbers in leaves</p> <p>14: Dissection of fish head to show the gas exchange system</p> <p>15: Scientific drawing of a low power plan of a prepared slide of dicotyledon leaf e.g. Ligustrum (privet), including calculation of actual size and magnification of drawing</p> <p>16: Investigation into transpiration using a simple potometer</p> <p>17: Scientific drawing of a low power plan of a prepared slide of T.S artery and vein, including calculation of actual size and magnification of drawing</p> <p>18: Dissection of mammalian heart</p> |
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