

The UCGS standard: Biology and Year 7 Science

Year group	UCGS standard
13	In the context of the A level Y13 Biology curriculum students are able to address the assessment objectives to a high standard: AO1 Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures. Students are able to communicate good knowledge and detailed understanding of the full range of concepts from A level Biology. Students have a good ability to use and synthesise skills such as interpreting, evaluating, problem solving, judging, drawing conclusions. AO2 Apply knowledge and understanding of scientific ideas, processes, techniques and procedures: •in a theoretical context students will be able to answer questions/tasks using their applied knowledge in written, numerical, theoretical, practical, ethical, social, economic and environmental scenarios. Students are able to formulate and test hypotheses and link this to evidence, theories and explanations, alongside using models to explain phenomena, events and processes. •in a practical context students are able to adapt, modify and enhance experimental procedures with justifications. They are also able to apply and demonstrate appropriate skills and modify/improve experimental procedures (also refer to the section on core practical activities below). •when handling qualitative data students are able to critically evaluate quantitative and qualitative data and develop arguments and explanations, taking into account limitations of the available evidence. •when handling quantitative data. Students can recall and manipulate both simple and complex mathematical formulae. Students can apply higher level mathematical skills to analyse evidence provided. AO3 Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: •make judgements and reach conclusions •develop and refine practical design and procedures Students should be able to relate scientific advances to the ethical implications of the scientific advances, and be able to analyse and evaluate the associated risks and benefits. In order to achieve a Pass in the practical element of the final GCE (A 'Level), students must: Carry out a minimum of 12 core practical activities which, together, meet the requirements of practical skills identified for direct assessment and developed through teaching and learning and use of apparatus and techniques from the prescribed subject content.
12	In the context of the A level Y12 Biology curriculum students are able to address the assessment objectives: AO1 Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures. Students are able to communicate good knowledge and detailed understanding of the full range of concepts from A level Biology. Students have a good ability to use and synthesise skills such as interpreting, evaluating, problem solving, judging, drawing conclusions. AO2 Apply knowledge and understanding of scientific ideas, processes, techniques and procedures: •in a theoretical context Students will be able to answer questions/tasks using their applied knowledge in written, numerical, theoretical, practical, ethical, social, economic and environmental scenarios. Students are able to formulate and test hypotheses and link this to evidence, theories and explanations, alongside using models to explain phenomena, events and processes. •in a practical context students are able to adapt, modify and enhance experimental procedures with justifications. They are also able to apply and demonstrate appropriate skills and modify/improve experimental procedures.

	•when handling qualitative data students are able to critically evaluate quantitative and qualitative data and develop arguments and explanations, taking into account limitations of the available evidence. •when handling quantitative data. Students can recall and manipulate both simple and complex mathematical formulae. Students can apply higher level mathematical skills to analyse evidence provided. AO3 Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: •make judgements and reach conclusions •develop and refine practical design and procedures Students should be able to relate scientific advances to the ethical implications of the scientific advances, and be able to analyse and evaluate the associated risks and benefits.
11	With regards to Year 11 curriculum content (including microorganisms, the brain, the eye, the kidneys, Plant Hormones, DNA, Cloning and Food Production), as well as recall and use of Year 10 and Year 9 content: Pupils are able to • communicate precise knowledge and detailed understanding of the full range of concepts from GCSE Biology • answer questions/tasks using their applied knowledge in written, numerical, theoretical, practical, ethical, social, economic and environmental scenarios • relate scientific advances to the ethical implications of the scientific advances • analyse and evaluate the associated risks and benefits • adapt, modify and enhance experimental procedures with justifications • apply and demonstrate appropriate skills (communication/mathematical/technological) • apply these skills to other scenarios • to use and synthesise skills such as interpreting, evaluating, problem solving, drawing conclusions, and this is becoming more detailed • critically evaluate quantitative and qualitative data and develop arguments and explanations, taking into account limitations of the available evidence • apply higher level GCSE mathematical skills, for example in calculations • carry out correct use of punctuation, sentences, capital letters and paragraphs, along with a high standard of spelling The Biology Only section of the curriculum is generally more challenging than the core content
10	With regard to the Year 10 curriculum content (including Respiration, Homeostasis, Nervous system, Genetics, Evolution and Ecology), as well as recall and use of Year 9 content: Pupils are able to • communicate precise knowledge and detailed understanding of the full range of concepts from Year 10 Biology • answer questions/tasks using their applied knowledge in written, numerical, theoretical, practical, ethical, social, economic and environmental scenarios • relate scientific advances to the ethical implications of the scientific advances • can analyse and evaluate the associated risks and benefits • adapt, modify and enhance experimental procedures with simple explanations of reasoning • to use and synthesise skills such as interpreting, evaluating, problem solving, drawing conclusions, and this is becoming more detailed • critically evaluate quantitative and qualitative data and develop arguments and explanations, taking into account limitations of the available evidence • apply higher level GCSE mathematical skills, for example in calculations • carry out correct use of punctuation, sentences, capital letters and paragraphs, along with a high standard of spelling

9	With regard to the Year 9 curriculum content (including Cells, Cell Transport, Circulation, Enzymes, Diseases and Photosynthesis): Pupils are able to • communicate precise knowledge and detailed understanding of the full range of concepts from Year 9 Biology • answer questions/tasks using their applied knowledge in written, numerical, theoretical, practical, ethical, social, economic and environmental scenarios • relate scientific advances to the ethical implications of the scientific advances • can analyse and evaluate the associated risks and benefits • adapt, modify and enhance experimental procedures with simple explanations of reasoning • to use and synthesise skills such as interpreting, evaluating, problem solving, drawing conclusions, and this is becoming more detailed • critically evaluate quantitative and qualitative data and develop arguments and explanations, taking into account limitations of the available evidence • apply higher level GCSE mathematical skills, for example in calculations • carry out correct use of punctuation, sentences, capital letters and paragraphs, along with a high standard of spelling
8	To achieve grade 8, pupils: • recognise that different strategies are required to investigate different kinds of scientific questions • adapt their approach to practical work to control risk, for example when carrying out food tests or culturing bacteria • record data that are relevant and sufficiently detailed, and choose methods that will obtain these data with the precision and reliability needed • communicate findings and arguments, showing awareness of a range of views for example on topics such as drugs, biodiversity or genetic modification • demonstrate extensive knowledge and understanding related to organisms, their behaviour and the environment • use and apply this effectively in their descriptions and explanations, identifying links between topics, for example relating cellular structure of organs to their associated life processes • interpret, evaluate and synthesise data from a range of sources and in a range of contexts, for example data on human characteristics, photosynthesis rates or breathing rates • analyse data and begin to explain and allow for anomalies • understand the relationship between evidence and scientific ideas, and why scientific ideas may need to be changed, for example the short-term and long-term effects of environmental change on ecosystems • describe and explain the importance of a wide range of applications and implications of science, such as relating photosynthesis and respiration to changes in the atmosphere and growth of crops.
7	Grade 7 Pupils: • understand the different methods are required to investigate different kinds of scientific questions, and can select an appropriate strategy with some guidance • understand the need for safe working in the laboratory and can explain simple safety procedures, for example in preparing and studying cells under a microscope, and plant dissection • record relevant data in simple tables, for example on bicep lifts • analyse data and begin to explain and allow for anomalies • communicate findings and arguments, using their scientific knowledge to explain their results

- may begin to **evaluate evidence critically** and suggest how inadequacies can be remedied.

Grade 8 Pupils:

- **demonstrate developing knowledge and understanding** related to organisms, their behaviour and the environment
- use and apply this effectively in their descriptions and explanations, **identifying links between topics**, for example relating cellular structure of organs to their associated life processes
- **interpret, evaluate and synthesise data** from given sources and in some different contexts, for example human height
- show they understand the relationship between **evidence** and **scientific ideas**, and why scientific ideas may need to be changed, for example the short-term and long-term effects of environmental change on ecosystems
- **describe and explain** the importance of some of **applications** and **implications** of science, such as relating pollination to agriculture