Grade Descriptions for Cambridge International AS Level Biology 9700

What are grade descriptions?

Grade descriptions describe the level of performance typically demonstrated by candidates achieving the different grades awarded for a qualification. For Cambridge International AS Levels, they describe performance at three levels – grades 'E', 'C' and 'A'.

Grade descriptions sit alongside other key documents that illustrate examination standards, including:

- the syllabus, which presents what students should be taught over a course of study and explains how this is assessed
- the specimen assessment materials, which exemplify the structure of the assessment and the kinds of tasks that candidates complete
- grade thresholds, which show the total mark required to achieve a grade.

Grade descriptions are produced with a wide range of audiences in mind. For teachers, they support lesson planning and curriculum development, while students may gain useful insights into what is required to achieve a high grade and what candidate performance at lower grades typically looks like. For university admissions staff and employers, and those less familiar with Cambridge, they paint a picture of typical performance at different grades.

Cambridge publishes grade descriptions for a qualification once examinations have taken place for the first time, and we review them when a qualification is substantially revised. They are developed by highly experienced examiners who understand performance standards in the subject area and have studied samples of candidate work.

How do I use this resource?

Grade descriptions are presented as a grid, with content areas at the start of each row and the different grades at the top of each column.

The content areas group together various aspects of the syllabus – they reflect topics, assessment objectives, key concepts, syllabus aims and components. The way they are organised is specific to each subject.

For each content area, there is a descriptor for each grade. Reading across the row from left to right, the descriptors represent increasing levels of performance, with each grade descriptor building on, and including, the last.

Each column represents overall performance at a particular grade. Reading down the column from top to bottom, the descriptors capture the range of knowledge, understanding and skills that a candidate comfortably achieving the grade is likely to demonstrate.

Cambridge produces grade descriptions to support teaching and learning and the interpretation of candidate scores and grades. We do not use them to set grade thresholds. As such, they cannot be used to challenge the grade awarded to any individual candidate.

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Grade Descriptions

Area of knowledge, understanding and skills	Typical performance at grade E	Typical performance at grade C	Typical performance at grade A
Cells as the units of life	Students outline differences between prokaryotes and eukaryotes. They describe plant and animal cell structures seen with a light microscope and know some details of ultrastructure. They may confuse the structure of bacterial cells and viruses. They outline the arrangement and roles of the main components of cell membranes. They describe passive diffusion and osmosis, but they may confuse active transport and facilitated diffusion, and water potential and water concentration. They usually name the stages of mitosis in the correct sequence and give some detail of the events occurring during the cell cycle.	Students make detailed comparisons of prokaryotic and eukaryotic cell structure, and describe most cell structures and state their functions. They may not know that viruses have either RNA or DNA. They know the main functions of membranes and their components and describe the fluid mosaic model and the different mechanisms of movement across membranes but may use the term osmosis even when water is not moving across membranes. They explain results of simple investigations. They know the phases of interphase, describe the main events occurring in the stages of mitosis and outline cytokinesis.	Students demonstrate comprehensive knowledge of cell structures and their functions and of intracellular relationships between structures. They identify features and cell types from unfamiliar images. They describe viral structure accurately. They suggest how membranes change when structural modifications occur. They use correct terminology to describe and explain the types of membrane transport and explain the results of more complex investigations. They describe and explain the mitotic cell cycle and state differences between mitosis in plant and in animal cells.
Biochemical molecules and processes	Students recall the main features of the biological molecules and the tests to identify starch and reducing sugars. They are most confident with carbohydrates and proteins. They know the lock-and-key hypothesis and some detail of the induced-fit hypothesis of enzyme action. They describe graphs showing how different factors affect enzyme action. They know the main features of nucleic acid structure. They can be guided to outline the main events occurring in DNA replication and	Students demonstrate good knowledge of the biological molecules and describe the relevant biochemical tests. They draw the structures of the molecules named in the syllabus. They make comparisons but may confuse collagen and cellulose. They describe accurately the mechanism of enzyme action and outline details of how factors affect enzyme action. They compare the structure and roles of RNA and DNA and give sequential accounts of the	Students use detailed knowledge of biological molecules to show how structure is related to function. They describe the synthesis and breakdown of macromolecules and apply knowledge to unfamiliar molecules. They relate enzyme features to their function and mechanism of action, process information relating to more than one factor affecting enzyme action and understand how inhibitors affect enzyme kinetics.

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	protein synthesis. They may incorrectly state aspects of DNA replication when describing protein synthesis and vice versa. They use the genetic code to identify the correct amino acid coded for by an mRNA codon.	main events in DNA replication and in protein synthesis. They define a gene and a mutation. They understand, with reference to the genetic code, how mutation may affect a protein product.	They give detailed, sequential accounts of DNA replication and protein synthesis. They relate DNA structure to its function. They state the features of the genetic code and explain how different gene mutations affect protein structure and function.
Biological systems	Students recall some detail of plant transport and histology. They may confuse facts relating to transport in phloem with transport in xylem. They recall basic knowledge of the histology of the human gas exchange system and mammalian transport system. They make comparisons between arteries and veins and describe the cardiac cycle and the internal structure of the heart. They know outline detail of control of the cardiac cycle and the carriage of gases. They describe gas exchange in the lungs and the role of the ciliated epithelium.	Students know the different roles of xylem and phloem in plant transport and describe the main features of transport in xylem and in phloem; the role of companion cells in the transfer of assimilates is less well understood. They demonstrate detailed knowledge of the mammalian transport system and human gas exchange system; there may be less consistency in their knowledge of oxygen dissociation curves and the differences between structures in the gas exchange system.	Students describe and compare the distribution, histology, role and mechanisms of transport of xylem and phloem and apply principles to different plant examples. They demonstrate a high level of factual recall and understanding of the mammalian transport system and the gas exchange system. They usually interpret oxygen dissociation curves and show an understanding of control of the cardiac cycle. They deduce outcomes when asked about problems that occur in the systems.
Organisms and the environment	Students know that cholera and TB are bacterial diseases and recall some features of transmission and prevention and control. They confuse HIV and HIV/AIDS, and *Plasmodium* and *Anopheles*. Species names are frequently spelled incorrectly. They describe graphical and tabular data. They may confuse the action of penicillin with the effect of antibodies, and resistance with immunity.	Students show relatively good knowledge and understanding of the infectious diseases, know the correct spelling of most of the species and state a number of prevention and control methods. They interpret graphical and tabular data about diseases, extracting relevant supporting information. They provide an outline of the mode of action of penicillin and have an outline understanding of the impact of antibiotic resistance.	Students answer questions about all the different infectious diseases. They make deductions from graphical and tabular data and tackle unfamiliar diseases. They write fluently about the impact of antibiotic resistance and show understanding of the action of penicillin. They understand that the principles of the immune response are applied to vaccines and

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	They describe the main points of an immune response, though they may confuse the roles of B- and T-lymphocytes and give non-scientific explanations of immunological memory. They know some details of monoclonal antibody production.	They give details of an immune response and of vaccinations and outline the differences between the different types of immunity. They know the main stages of monoclonal antibody production.	give in-depth accounts of the role of vaccination programmes. They know how antibody structure is related to function and understand the principles behind monoclonal antibody technology so that they can apply these to new situations.
Organising, presenting and using information	Students formulate a response by recalling main facts. They show gaps in knowledge that may cover large parts of some syllabus topics. With prompting, they organise information from different areas to produce a relatively coherent account. They tend to be more successful with questions requiring short responses; extended responses can lack depth and breadth. They may lack confidence distinguishing between 'describe' and 'explain' command words. They carry out basic calculations but can be inconsistent converting units of length. They identify main patterns and trends from straightforward graphs and tables.	Students use provided information to identify one or more syllabus areas from which to extract knowledge. They organise the main ideas logically. They have good knowledge of syllabus topics but may not grasp the more complex learning outcomes, so responses to more complex questions may lack depth and/or relevance. They usually address command words correctly. They translate information from one form to another. They are familiar with most of the mathematical requirements of the syllabus. They identify trends and detailed patterns in data provided and usually suggest a valid conclusion.	Students consider the information provided and use knowledge from across the syllabus to select relevant facts and concepts to construct well-organised answers that are usually clear and concise. They pay attention to command words and instructional terms. They organise information sequentially when required and know when to translate information from one form to another. They support ideas with calculated values made from the correct extracted data. They identify trends and/or patterns from a range of different types and complexities of data, and they make well-considered conclusions.
Explaining phenomena and applying information	Students use their limited scientific knowledge to explain phenomena, sometimes using appropriate scientific terminology. They may introduce less relevant facts into their answers. They show confidence in areas that have developed from previous learning.	Students show familiarity with most of the main syllabus topics, but have only a partial grasp of more complex concepts. They extract information from different areas to give explanations and generally use appropriate scientific terminology.	Students consistently draw from their broad knowledge to give reasoned explanations for phenomena, patterns, trends and relationships, although they may have a few weak areas of syllabus knowledge. They tend to use scientific terminology confidently.

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	They tackle unfamiliar contexts that are similar to syllabus material and based on one area of the syllabus.	They apply knowledge to unfamiliar material, although extended responses may not cover all the relevant points.	They apply knowledge to unfamiliar material to present concise explanations of an appropriate depth and breadth.
Problem solving and evaluating information	Students solve problems focused on one subject area and based on familiar syllabus content; they may be less successful working through problems involving new situations. They tend to produce descriptive responses to questions based on evaluative skills.	Students make links between different areas of syllabus content to solve problems, though some responses may require more thought to completely answer the question posed. They demonstrate good evaluative skills when the information required is set out clearly.	Students solve problems involving unfamiliar material, generally showing a good grasp of concepts and principles from across the syllabus. They weigh up evidence to evaluate information and generally qualify statements with useful detail.
Experimental and investigation skills	Students follow instructions using the apparatus and materials provided to carry out practical work: they may lack confidence with less familiar techniques. They make some measurements and basic observations to obtain and record results and recognise the need to repeat experiments. They carry out straightforward calculations when instructed, but they may be disorganised when setting out working, and/or significant figures may not be considered in answers. They construct simple tables, graphs or charts; these may not always have a conventional layout. They use results to summarise a main conclusion but may not always support this with experimental data, calculations and/or biological explanations.	Students understand instructions and choose appropriate apparatus and materials: they make and record enough measurements to identify trends and/or make a suitable conclusion. They recognise that a range of values for the independent variable, at suitable intervals, should be used and may be able to suggest a control experiment. They show the steps in working and obtain correct calculated values, given to the correct number of significant figures. They generally use the appropriate format and correct layout for presenting results. They recognise anomalous results. They summarise main conclusions and give some relevant extracted or processed data in support. They can include biological explanations if the material is familiar.	Students understand scientific method and work confidently; they make decisions on techniques to obtain accurate results and usually suggest control experiments. They gauge the range or number of measurements to be made and generally record results to a correct number of decimal places. They decide on one or more appropriate calculations to be made. They consistently use the appropriate format and correct layout to present results. They take account of anomalous results and predictions to summarise main conclusions. They may cover different syllabus areas when giving biological explanations for observations and conclusions. They tend to give more than enough extracted or processed data to support ideas.

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	They identify the most obvious anomalous results and main sources of error, and they suggest improvements to experiments that are of a similar nature to work previously carried out. They use a light microscope to obtain images, use an eyepiece graticule to gauge proportions and draw labelled diagrams to show main details of images or specimens.	They identify sources of error in an investigation and suggest improvements. They follow instructions to use an eyepiece graticule and stage micrometer and generally draw, label and annotate diagrams in detail; they may be less confident applying knowledge to unfamiliar material.	They identify systematic and random errors, suggest and explain improvements and suggest how to extend an investigation. They know how to use an eyepiece graticule and stage micrometer and can draw, label and annotate diagrams to an appropriate degree of detail, including fine detail.