Grade Descriptions for Cambridge International AS Level Marine Science 9693

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/or 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
The science of water	Students understand that sea water is a solution made of different solutes dissolved in water. They can identify an environmental factor which affects gas solubility in sea water. They understand that atoms are linked by bonds and can state that a water molecule is formed when two hydrogen atoms bond with an oxygen atom. They know that the concentration of salts in sea water can change due to environmental factors and can state a factor which causes this change.	Students describe how environmental factors such as temperature or salinity can increase or decrease gas solubility in sea water. They can name the three types of bonds linking atoms together and can state that in a water molecule, electrons are shared between the hydrogen and oxygen atoms. They identify factors such as precipitation and evaporation and state if these cause an increase or a decrease in the salinity of sea water.	Students explain the term solubility and can describe the implications of an increase or decrease in gas solubility for marine organisms. They can represent bonding in a water molecule diagrammatically. They can explain how hydrogen bonds form between water molecules. They can define the term salinity and can explain the significance of different salinities of sea water having different densities.
Forming and shaping the ocean floor and coastlines	Students show some understanding of the terms ‘erosion’ and ‘sedimentation’ and can state that these processes are important in shore formation. They understand that during the tidal cycle the levels of seas and oceans rise and fall twice a day. They can identify water temperature as a factor that would be affected by the tidal cycle in a lagoon.	Students understand the causes of erosion and that sand particles are deposited to form a sandy shore. They can state that sedimentation is greatest on muddy shores. They suggest how changes in the tidal cycle affect abiotic factors such as temperature and salinity but are less confident describing how changes in the tidal cycle effect biotic factors.	Students can explain the role of erosion and sedimentation in the formation of a sandy shore and a muddy shore and can also explain how the particles move and why they settle. They identify a range of both abiotic and biotic factors, such as food availability, competition and desiccation, that would change in a lagoon due to the tidal cycle.

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	They understand that water in the oceans mixes via currents which travel around the Earth. They understand that the Earth's crust is made up of plates which fit together like a jigsaw. They know that the plates are responsible for the formation of different features on the ocean floor, such as hydrothermal vents or volcanoes.	They describe and explain some of the features of the global conveyor belt, for example the effect of temperature changes on water density or that the currents cycle from shallow water to deep water. They can describe some of the main points in the theory of plate tectonics and can name and describe the different types of plate boundaries.	They describe and explain most of the features of the global conveyor belt including the route taken and the physical processes taking place causing warming and cooling of currents. They provide examples of evidence such as paleomagnetic stripes on the ocean floor and distribution of fossils to support the theory of plate tectonics.
Relationships in marine ecosystems	Students recognise that marine plants such as diatoms can photosynthesise using light energy from the Sun and that these are a food source for consumers. They understand that feeding relationships can be represented in a food web. They can draw a simple food chain and can interpret pyramids of numbers. They understand that there is a reservoir of nutrients dissolved in the ocean which is available to marine organisms. They can state one or two factors which replenish dissolved nutrients in sea water.	Students describe the process of photosynthesis and can state that the glucose formed is an energy source for the food chain. They can draw, label and interpret complex food chains and food webs and can also interpret typical pyramids of biomass. They explain how run-off and upwelling replenish dissolved nutrients in sea water, though make limited references to the role of bacteria in decomposition.	Students understand that photosynthesis involves the conversion of inorganic substances to organic substances, which are used to produce biomass. They can interpret pyramids of energy and pyramids of biomass which include those that incorporate parasites and periods of phytoplankton bloom. They can explain how tectonic activity, excretion and atmospheric dissolution contribute to replenishing dissolved nutrients in sea water and that these are depleted when nutrients are taken up by marine organisms.

Area of knowledge, understanding and skills	Typical performance at grade E	Typical performance at grade C	Typical performance at grade A
Classification of marine organisms and the different ecosystems they inhabit	Students use a key to correctly identify a marine species. They can recognise a main feature of some key groups of marine animals and plants. They can state examples of marine ecosystems such as tropical coral reefs and rocky shores. They identify a condition such as 'salt water' or 'tropical temperature' required for the development of a mangrove forest. They understand that maintaining a high level of biodiversity in marine ecosystems such as coral reefs is important in providing a range of food sources as well as employment and money for the local economy.	Students state the main features of most key groups of marine organisms, though find stating features of the phylum Chordata more challenging. They can identify the main features of each marine ecosystem. They can provide some detail on how mangroves reproduce but are sometimes unsure of the difference between seeds and propagules. They understand that maintaining biodiversity is important for other factors including controlling climate change and providing a source of medicines such as KLH. They can provide examples of how increased biodiversity would benefit the local economy.	Students identify at least two main features from each key group of marine organisms. They have excellent knowledge of the conditions suitable for the development of a mangrove forest and can describe in detail how mangroves reproduce using seeds and propagules and why dispersal away from the parent plant is advantageous. They have some knowledge that biodiversity can be considered at different levels, for example genetic, species and ecological diversity.
Handling and applying information and data	Students answer questions with straightforward command words such as 'state', 'describe' and 'outline'. They sometimes use appropriate scientific terminology. Responses to structured short-answer questions are sometimes of the correct depth but responses to longer free-response questions are generally less detailed. They can handle information in a familiar context and perform better on recall questions and questions based on familiar syllabus content.	Students answer questions with more complex command words such as 'suggest' and understand the difference between 'describe' and 'explain'. They show evidence of knowledge of most areas of the syllabus when answering extended free-response questions in continuous prose. Responses to questions based on more complex ideas may lack depth. They can generally apply factual knowledge	Students answer questions with higher order command words such as 'discuss', 'analyse', 'evaluate' and 'predict'. They have sufficient knowledge to provide comprehensive answers to free-response questions in continuous prose and can support their answers with facts and examples. They demonstrate comprehensive knowledge of the syllabus and can apply this knowledge to new situations.

Area of knowledge, understanding and skills	Typical performance at grade E	Typical performance at grade C	Typical performance at grade A
		and principles to answer questions on unfamiliar material.	
	They are usually successful when carrying out straightforward calculations such as calculating the difference between two values or calculating a mean.	They complete calculations such as calculation of a percentage using data from a graph or table and can select the appropriate units. They usually give answers to the correct number of significant figures.	They complete more complex calculations using data from a graph or table, including calculating percentage change or rate of change and whether this change is positive or negative. They understand the difference between significant figures and decimal places.
	They can complete a table to calculate a value for one of the AS Level statistical tests but are less confident completing a calculation using the formula provided and do not always show their workings.	They complete a table to calculate a value for a statistical test and can usually use the formula provided to calculate the correct answer, showing all their workings. They are sometimes able to describe how the answer links to a given hypothesis.	They complete tables and calculations for any of the AS Level statistical tests and are also able to justify how the results support or reject a given hypothesis.
	They usually identify the main patterns and report trends when provided with straightforward graphical and tabular data.	They identify trends and detailed patterns in data provided, for example identifying a negative correlation, and can usually suggest a valid conclusion.	They identify trends and/or patterns from a range of different types and complexities of data and make well-considered conclusions.
Experimental planning	Students understand that the relationship between two factors (e.g. salinity and temperature) can be predicted and tested by an experiment. They state one or two of the steps involved when describing how to set up an experiment. Wording is often vague, such as stating ‘amount’ instead of ‘volume’ or ‘concentration’, and the apparatus selected is often limited.	Students make a suitable prediction for an experiment or data which is familiar to them. They can represent a relationship graphically, though axis labels are often missing. They state many of the steps involved when describing how to set up an experiment and usually include some appropriate apparatus.	Students make a suitable prediction for experiments or data which require application of existing knowledge. They can represent a relationship graphically with axes correctly labelled. They can describe how to set up an experiment using appropriate apparatus, quantities of materials and scientific language.

Area of knowledge, understanding and skills	Typical performance at grade E	Typical performance at grade C	Typical performance at grade A
	They find the identification of variables difficult but can usually state a variable to standardise. They have some idea that the experiment needs to be repeated, but wording can be imprecise, such as calculating the 'average' instead of calculating a 'mean'. They design a basic results table but find it difficult to suggest improvements for a results table that has been provided. Lines are often drawn free-hand and units are often missing from column headings.	They usually identify the dependent and independent variables, but describing how measurements are taken is often unclear. They usually quote more than one variable to standardise and state that the experiment must be repeated to calculate means. They design a suitable results table with suitable headings and units but are less successful in suggesting more than one improvement for a results table that has been provided.	They identify variables and can suggest how the dependent variable should be measured using suitable apparatus. They can list standardised variables and can replicate the experiment at least twice to calculate means. They can confidently design a results table with correct headings and units and can suggest improvements for a results table that has been provided.
Presenting data and observations	Students add data to an existing graph using a limited number of plots, though scale and axes labels are often incorrect or missing and line quality is generally poor. Plots are usually represented as a large 'blob' instead of a small dot within a circle or a small cross. They make a drawing from a photograph of a marine organism, which is usually of a suitable size. However, line quality is very poor as shading is often used. They can sometimes identify a correct structure on a drawing or diagram to label, for example the caudal fin on a fish.	Students add data to an existing graph using an appropriate scale, but line quality is often unclear, and units are sometimes missing from axis labels. They make a drawing from a photograph of a marine organism, which is usually of a suitable size and proportions. Line quality can be poor and fine detail is often missing. They can identify and label a structure correctly, but the label line is usually unruled.	Students add data to an existing graph using an appropriate scale and axes labelled with the correct units. Line quality is generally good, and they recognise when to use a ruled line and when to use a line of best fit. They make a large drawing in pencil from a photograph of a marine organism, which shows fine detail, is in the correct proportions and has a clear outline. They can identify and label a structure correctly using a ruled line without arrowheads which touches the structure.

Area of knowledge, understanding and skills	Typical performance at grade E	Typical performance at grade C	Typical performance at grade A
Evaluating procedures and data	Evaluation of data from a graph or table usually consists of a general conclusion only. They tend to produce descriptive responses to questions based on evaluative skills and have difficulty in discussing the extent to which data support a theory.	Evaluation of data from a table or graph consists of a conclusion with suitable examples quoted to justify the conclusion. They demonstrate some good evaluative skills when the information is set out clearly.	Students perform a thorough evaluation of data from a table or graph and can discuss the positive and negative aspects of the results. They weigh up evidence to evaluate information, such as identifying a correlation between two factors, and can suggest possible improvements where required.