



National
Qualifications
2026

2026 Environmental Science

National 5

Question Paper Finalised Marking Instructions

These marking instructions have been prepared by examination teams for use by Qualifications Scotland appointed markers when marking external course assessments.

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General marking principles for National 5 Environmental Science

Always apply these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidates' responses.

- (a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- (b) If a candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you should seek guidance from your team leader.
- (c) Where a candidate makes an error at an early stage in a multi-stage calculation, award marks for correct follow-on working in subsequent stages. Do not award marks if the error significantly reduces the complexity of the remaining stages. Apply the same principle in questions that require several stages of non-mathematical reasoning.
- (d) Award full marks for a correct final answer (including units if required) on its own with no working shown.
- (e) Candidates may access larger mark allocations fully, whether they respond in continuous prose, linked statements, or a series of discrete developed points.
- (f) In the detailed marking instructions, if a word is underlined then it is essential; if a word is **(bracketed)** then it is not essential.
- (g) In the detailed marking instructions, words separated by/are alternatives.
- (h) Do not award marks if a candidate gives two answers, where one is correct and the other is incorrect.
- (i) Where the candidate is instructed to choose one question to answer but instead answers both questions, mark both responses and award the better mark.
- (j) Award marks for a valid response, even if the response is not presented in the format expected. For example, award the mark if the response is correct but is not presented in the table as requested, or if it is circled rather than underlined as requested.
- (k) Candidates may use abbreviations (for example, SEPA or INNS) or chemical formulae (for example, CO₂ or H₂O) as acceptable alternatives to naming, unless required by the question, but these must be correct. For instance, chemical formulae with an incorrect subscript or superscript component (for example CO²), or full-size number (for example CO2) should not be awarded the mark.
- (l) Award marks, up to the maximum mark allocation for the question, for content that is outwith the course specification but used appropriately at the correct level for National 5.
- (m) If candidates are required to give a numerical answer, and units are not given in the stem of the question or the answer space, they must supply the units to gain the mark.
- (n) If incorrect **spelling** is used:
 - and the term is recognisable, then award the mark;
 - and the term can easily be confused with another scientific term, then do not award the mark, for example quadrat and quadrant, or nitrite and nitrate, or fractional distillation and frictional distillation;
 - and the term is a mixture of other terms, then do not award the mark.

(o) When presenting data:

- for marking purposes no distinction is made between bar charts (used to show discontinuous features, have descriptions on the x -axis and have separate columns) and histograms (used to show continuous features, have ranges of numbers on the x -axis and have contiguous columns)
- other than in the case of bar charts/histograms, if the question asks for a particular type of graph or chart and the wrong type is given, then do not award the plotting mark. Marks may still be awarded for other required components, as specified in the detailed marking instructions.
- do not award the relevant mark if the graph too small to check the accuracy of plotting; or if 0 is plotted when no data for this is given (ie candidates should only plot the data given)

(p) Award marks only for a valid response to the question asked. For example, in response to questions that ask candidates to:

- **identify, name, give, or state**, they need only name or present in brief form;
- **define**, they should give a statement of the definition;
- **calculate**, they must determine a number from given facts, figures, or information;
- **compare**, they must demonstrate knowledge and understanding of the similarities and/or differences between things;
- **describe**, they must provide a statement or structure of characteristics and/or features;
- **evaluate**, they must make a judgement based on criteria;
- **explain**, they must relate cause and effect and/or make relationships between things clear;
- **justify**, they must give reasons to support their suggestions or conclusions;
- **discuss**, they must write about a topic in detail, taking into account different issues or ideas;
- **outline**, they must provide a brief sketch of content - more than naming but not a detailed description;
- **predict**, they must suggest what may happen based on available information;
- **suggest**, they must apply their knowledge and understanding of Environmental Science to a new situation. A number of responses are acceptable: marks will be awarded for any suggestions that are supported by knowledge and understanding of Environmental Science.

Note that this list is not exhaustive.

Marking instructions for each question

Section 1

Question			Expected response	Max mark	Additional guidance
1.	(a)		An animal that only eats plant material.	1	Must have reference to the fact that plant material is the only food source.
	(b)	(i)	They are not members of the same species.	1	
		(ii)	Captive breeding/conservation areas/legal protection	1	Any other valid response.
	(c)		73(%)	1	$\frac{6200}{8500} \times 100$ Accept: 72.9, 72.94(%)
	(d)		Will allow various different plant species to grow/prevent fast growing plants from outcompeting other plant species, (1 mark) which can create a variety of habitats/niches/food sources for organisms. (1 mark) OR Removal of bark from trees will kill the trees (1 mark) allowing more light to reach plants on the forest floor. (1 mark) OR Removal of bark from trees will kill the trees (1 mark) decaying trees will provide habitat/food for other organisms. (1 mark) OR Bison can disperse seeds further from parent plant (1 mark) reducing competition between plants (1 mark)	2	1 mark for impact of grazing behaviour. 1 mark for explanation of how impact can increase biodiversity. Any other valid response.
	(e)	(i)	NatureScot/NS	1	
		(ii)	Providing advice to named party such as government or farmer/educating public about bison/designating the bison habitat as an SSSI.	1	Answer must relate to the reintroduction of the bison. Any other valid response.

Question			Expected response	Max mark	Additional guidance
2.	(a)		People moved to the town to gain employment.	1	Any other valid response.
	(b)	(i)	Blast furnace	1	
		(ii)	Formed in sea water as a result of oxygen release by photosynthesising organisms; (1 mark) the oxygen combines with dissolved iron (in the ocean) to form iron oxide. (1 mark)	2	1 mark for location AND reference to photosynthesising organisms. 1 mark for reference to formation of iron oxide from oxygen and dissolved iron.
		(iii)	Limestone - removes impurities. (1 mark) Coke - fuel source/reducing agent/increases temperature (1 mark)	2	Do not accept: reference to increase pH/neutralising acid. 1 mark for the role of limestone. 1 mark for the role of coke. Any other valid response.
	(c)	(i)	The area of the loch has decreased in size/the shoreline has moved.	1	Any other valid response. Accept: 'The volume has decreased'.
		(ii)	Slag	1	
		(iii)	The slag (is toxic and) may kill or harm organisms/(non-biodegradable so) accumulates in the tissues of organisms/prevents soil formation/prevents plant growth.	1	Do not accept: 'causes water pollution' alone Any other valid response.

Question			Expected response	Max mark	Additional guidance
2.	(d)	(i)	Solar panels can reduce energy bills. (1 mark) OR Wooden materials used/may be cheaper than metal/other materials. (1 mark) OR Café will make money that can be used to support/maintain/improve the park facilities. (1 mark) OR LED lights (require less energy) reduce energy bills. (1 mark)	1	1 mark for explanation of how feature may be considered economically sustainable. Any other valid response.
		(ii)	Can promote friendships or counteract loneliness with community clubs/can encourage people to walk or exercise, improving health/outdoor space can boost mental health/can provide educational opportunities.	1	Any other valid response.

Question			Expected response	Max mark	Additional guidance
3.	(a)	(i)	To reprocess materials into new and useful products.	1	Reference to reusing would negate.
		(ii)	Most things that are easy to recycle are already being recycled/ uncertainty over what can and cannot be recycled/difficulty in accessing recycling centres/reduced waste collections/greater uptake of reusable products.	1	Any other valid response
		(iii)	Reduce Reuse	1	2 correct = 1 mark 1/0 correct = 0 marks
		(iv)	Education and awareness campaigns/improved access to recycling centres/consistent recycling policy/provide bins to households to encourage recycling.	1	Response must be within local authorities' powers. Any other valid response.
	(b)	(i)	The mass of household waste incinerated is increasing over time.	1	
		(ii)	Bans on waste going to landfill/more single use products/growing population means more waste/less exportation of waste to other countries.	2	Any 2 Any other valid response.

Question			Expected response	Max mark	Additional guidance
3.	(b)	(iii)	SDG 7 - burning waste is cheaper than buying new fuel source. (1 mark) OR SDG 11 - burning waste can recover energy that would otherwise be lost/reduce mass of waste/require less land for landfill/less visual pollution. (1 mark) OR SDG 12 - processes requiring energy can be powered from energy produced during incineration /reduces extraction of natural resources/minimises solid waste going to landfill. (1 mark) OR SDG 14 - less risk of physical harm to organisms from waste in oceans/less chemicals or microplastics enter water or (aquatic) food web. (1 mark) OR SDG 15 - less risk of physical harm to organisms from litter/less leaching of chemicals into soils/lower risk of chemicals entering food webs. (1 mark)	1	Do not accept: 'Causes pollution' alone Any other valid response.
		(iv)	To meet net zero targets/to improve air quality/to reduce greenhouse gas emissions/to focus on increasing recycling rates/to avoid community opposition.	1	Any other valid response.

Question			Expected response	Max mark	Additional guidance
4.	(a)		glucose → carbon dioxide + oxygen + water	1	Accept: sugar in place of glucose. Do not accept: starch in place of glucose. Do not accept: a combination of words and chemical formulae.
	(b)	(i)	The oxygen is being used by the woodlice (for respiration). (1 mark) The liquid rises up tube X to replace the removed oxygen. (1 mark)	2	Any other valid response.
		(ii)	To ensure only the removal of oxygen is responsible for the rise in liquid/to ensure carbon dioxide does not affect liquid levels.	1	Any other valid response.
		(iii)	To show that respiration occurs only in living organisms/woodlice. OR System B acts as a control.	1	Any other valid response.
		(iv)	The axes of the graph have suitable scales. (1 mark) The axes of the graph have suitable labels AND units. (1 mark) Accurate plotting of points and line of best fit. (1 mark)	3	Plotting mark cannot be awarded if points are joined with a line.
		(v)	To make it a fair test/increase validity.	1	Any mention of reliability, accuracy, or precision will negate.
		(vi)	The liquid would rise further up (tube X).	1	
	(c)	(i)	2, 3, 6	2	All 3 correct - 2 marks 2 correct - 1 mark 1 or 0 correct - 0 marks
		(ii)	They are detritivores/feed on dead organic matter, (1 mark) which will recycle carbon/release carbon back into the environment. (1 mark)	2	Any other valid response.

Question			Expected response	Max mark	Additional guidance
5.	(a)	(i)	Kinetic to electrical.	1	Do not accept: movement or electricity.
		(ii)	Strong or steady wind flow/exposed site/population density/proximity to National Grid/current land or water use.	2	Any 2
	(b)		It is meeting current energy needs (1 mark) but does not release greenhouse gases/require further fossil fuel extraction that could impact future generations. (1 mark)	2	1 mark for reference to meeting current energy needs. 1 mark for reference to not compromising future needs. Any other valid response. Maximum 1 mark for sustainable development definition alone.
	(c)	(i)	Acidic (1 mark) Anaerobic (1 mark)	2	Accept reference to waterlogging in place of anaerobic conditions. Any other valid response.
		(ii)	The mass of living or recently living plants or animals.	1	

Question			Expected response	Max mark	Additional guidance
6.	(a)		June (1 mark) as it has the lowest level of precipitation (1 mark) and a higher temperature (leading to greater evaporation). (1 mark) OR July (1 mark) as it has the highest temperature (leading to greatest evaporation) (1 mark) and lower levels of precipitation. (1 mark)	3	1 mark for month. 1 mark for evidence from the graph for precipitation. 1 mark for evidence from graph for temperature. Any other valid response.
	(b)	(i)	Numbers of tourists will change throughout year (1 mark) increasing demand during peak times/decreasing demand during off-peak times. (1 mark) OR In warmer temperatures (1 mark) there will be more paddling pools/hot tubs/watering gardens. (1 mark)	2	1 mark awarded for reason. 1 mark awarded for justification. Any other valid response.
		(ii)	Showering rather than bathing/use of water butt/turn tap off whilst brushing teeth/full load appliance running/fixing leaks/low flow aerators/hippo bricks/using grey water.	2	Any 2 Any other valid response.

Question			Expected response	Max mark	Additional guidance
7.	(a)		Condensation/throughflow/ groundwater flow	1	Any other valid response.
	(b)	(i)	Deforestation will result in less/no transpiration. (1 mark) This will reduce the water/ moisture/clouds in the air. (1 mark)	2	Any other valid response.
		(ii)	There would be more (surface) run-off, (1 mark) as there would be fewer canopies/ root systems/trees to absorb/intercept water. (1 mark)	2	Any other valid response.
		(iii)	Aquifer/groundwater (eg soil moisture, rock pores, crevices)	1	
	(c)	(i)	Nitrogen/N ₂	1	Do not accept: N
		(ii)	Oxygen decreases and carbon dioxide increases, (1 mark) due to decreased photosynthesis. (1 mark)	2	1 mark for impact on oxygen and carbon dioxide 1 mark for justification Any other valid response.

Section 2

Question			Expected response	Max mark	Additional guidance
8.	(a)	(i)	To identify potential environmental impacts/to ensure there are no endangered or protected species present/to ensure that there are sufficient minerals present/to ensure that time or money is not wasted.	1	Any other valid response.
		(ii)	Minerals are elements/compounds formed as a result of rock cycle processes, (1 mark) which can be extracted from rock/rock is composed of minerals. (1 mark)	2	
		(iii)	They cannot be remade in a human's lifetime/they are finite/they will eventually run out.	1	
	(b)	(i)	(Oceanic) crust	1	Do not accept: geosphere/seabed
		(ii)	2551 (m)	1	$p = \rho gh$ $30\,000\,000 = 1200 \times 9.8 \times h$ $h = 2551 \text{ m}$ Answer must be to the nearest metre.
		(iii)	Use a temperature probe/ thermometer (1 mark) and take the reading from the display/scale. (1 mark)	2	1 mark for identifying appropriate piece of equipment. 1 mark for describing how the temperature is read.
	(c)	(i)	Less CO ₂ means that less heat is trapped in the atmosphere, (1 mark) thereby minimising an increase in global temperatures. (1 mark)	2	1 mark for impact of removing CO ₂ 1 mark for impact on global temperature/climate Any other valid response.
		(ii)	549(% increase)	1	$\frac{279 - 43}{43} \times 100$ Accept: 550, 548.8
		(iii)	South Africa (1 mark) It can supply chromium AND manganese. (1 mark)	2	1 mark for country. 1 mark for identification of both minerals.
		(iv)	Wind	1	

Question			Expected response	Max mark	Additional guidance
8.	(d)	(i)	Reserves may not have yet been discovered/much of the seabed has not been explored/difficulty in getting to some depths of the seabed.	1	Any other valid response.
		(ii)	4.1 (times greater)	1	$\frac{7.0}{1.7} = 4.1$ Accept: 4, 4.12, 4.118
	(e)		<i>Approve application</i> - the United Kingdom only has land reserves of a few minerals and therefore needs greater access to more - minerals can be exported for money - minerals can be used to produce low-carbon technologies to reduce climate change - source of new minerals can reduce reliance on other countries - the process (and manufacture of equipment) creates jobs - can reduce land mining and therefore prevent further destruction of land ecosystems - can reduce land mining and therefore less of a social impact eg noise/visual pollution or health related impacts - access to minerals can drive forward technological developments in the UK	4	Any 4 Any other valid response. Marks allocated must be in support of candidate's decision.

Question	Expected response	Max mark	Additional guidance
8. (e) (continued)			
		<i>Do not approve application.</i> • sounds/vibrations/noise can disturb aquatic life • the release of plumes/discharge may contain toxic materials that can kill aquatic life • the release of sediment plumes can suffocate certain aquatic life (filter feeders) • the discharge of warm water alters temperature of surrounding water, killing organisms/ causing species redistribution/affecting oxygen levels • mining vehicles can destroy aquatic habitats, reducing biodiversity/killing aquatic life • mining vehicles can compact sediment altering its structure/kill sediment dwelling organisms and destroy habitats • there is a high capital cost that could be spent on other things • seabed mining can result in protests and social unrest that can cause disruption • most minerals are also available from land reserves	Any 4 Any other valid response. Marks allocated must be in support of candidate's decision.

Section 3

Question			Expected response	Max mark	Additional guidance
9.	A	(a)	Advantages: Does not require the use of agrochemicals/synthetic chemicals. (1 mark) There is less health risk to farmers from toxic chemicals. (1 mark) There are no agrochemicals entering the food chain. (1 mark) Less/no impact on pollinators/non-target species. (1 mark) Improves soil structure and fertility. (1 mark) Potential reduced risk of animal borne disease spreading through soil. (1 mark) Livestock farmed less intensively have higher welfare standards. (1 mark) Organic fertilisers release less greenhouse gases/contribute less to climate change. (1 mark) Consumers may view organic produce as healthier, boosting sales/willing to pay more. (1 mark) Can get grants/financial incentives from government by farming organically. (1 mark) Employment opportunities as organic farming is more labour intensive. (1 mark)	7	Max 5 marks for advantages. Do not accept: will not result in water pollution/eutrophication as organic alternatives, such as manure, can still cause this. Any other valid response.

Question			Expected response	Max mark	Additional guidance
9.	A	(b)	Disadvantages: (Generally) results in a lower yield. (1 mark) More expensive to produce/organic goods are more expensive. (1 mark) Crops may take longer to grow. (1 mark) Crops produced may be more susceptible to disease/pests. (1 mark) Farmers need to have specialised knowledge. (1 mark) Being certified as an organic farmer or certifying organic products can be time consuming and expensive. (1 mark) Organic farming requires more labour, increasing costs. (1 mark) Organic products spoil quicker. (1 mark) Demand for organic produce could decrease in times of financial hardship/recessions. (1 mark)		Max 5 marks for disadvantages. Any other valid response. Do not award marks for the converse of advantages eg an advantage of organic farming is the reduced risk of disease spreading through soil, but a disadvantage is that there is an increased risk of disease spreading through soil.

Question			Expected response	Max mark	Additional guidance
9.	B	(a)	Social: A lack of food can result in famine. (1 mark) Less food/famine can impact health/result in death (1 mark) Increased food demand/production will create more jobs. (1 mark) There may be an inequitable distribution of food between countries/social classes. (1 mark) Less food can result in competition/conflict for food /resources. (1 mark)	7	Max 4 marks for each factor. Full marks can only be awarded if all three factors have been addressed. Any other valid response.
		(b)	Economic: Increased demand/lower food availability will increase food prices. (1 mark) Increased food sales will increase profits. (1 mark) More people working in food production/distribution/sales means that more (income) tax will be generated. (1 mark) More businesses and companies may be set up/supported which will generate more tax/money for economy. (1 mark)		
		(c)	Environmental: Land will be cleared to make room for farmland. (1 mark) Use of fertilisers will pollute water/ cause eutrophication. (1 mark) Pesticides can enter the food chain/kill non-target Species (1 mark) More water abstracted for irrigation damages freshwater ecosystems/kills aquatic life. (1 mark)		

Question		Expected response	Max mark	Additional guidance
10.	A	An adaptation is any feature that makes an organism well suited to living in its environment. (1 mark) Adaptations increase the chance of survival/passing genes onto future generations. (1 mark) Desert habitats Camels have long eyelashes (1 mark) to prevent sand from entering the eye. (1 mark) They have humps that contain fat. (1 mark) which can release energy/water when needed. (1 mark) Camels have flat feet (1 mark) which allow them to move easily across the sand. (1 mark) Cacti have spines (instead of leaves) (1 mark) to reduce water loss. (1 mark) Cacti have a thick, waxy outer layer (1 mark) to prevent evaporation. (1 mark) Cacti have extensive root systems (1 mark) to maximise water uptake. (1 mark) Polar habitats Polar bears have thick fur (1 mark) which provides insulation. (1 mark) Polar bears have sharp claws (1 mark) to help them walk over ice/ provide grip. (1 mark) They have black skin (1 mark) to help absorb heat from the Sun. (1 mark)	7	Marks can only be awarded for correctly identifying organisms within the named habitat. 1 mark for each adaptation correctly identified in a named organism. Maximum 3 marks for a list of adaptations without explanation. 1 mark for each benefit linked to the adaptation. Candidates may be awarded marks for discussing either one organism in detail or several organisms in less detail. Any other valid response.

Question			Expected response	Max mark	Additional guidance
10.	B		Quantitative techniques provide information about frequency and distribution. (1 mark) Dip nets (1 mark) are used to investigate aquatic organisms/organisms living in ponds/rock pools/river shallows. (1 mark) Net can be placed under the fish and lifted, (1 mark) held downstream during kick sampling (1 mark) or by scooping into areas of cover/weeds/under undercut banks. (1 mark) Sweep nets (1 mark) are used to investigate organisms living in long grasses/hedges/flying insects. (1 mark) Involves the net being moved in a figure of eight motion (1 mark) before the net is inverted/net contents emptied into a container. (1 mark) Care is needed when using nets to avoid injuring or distressing organisms. (1 mark)	7	Max 5 marks for each net type. Any other valid response.

[END OF MARKING INSTRUCTIONS]