

GCSE
GEOGRAPHY

PAPER 1 LIVING WITH THE PHYSICAL ENVIRONMENT

Mark scheme

Specimen

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Assessment of spelling, punctuation, grammar and use of specialist terminology (SPaG)

Accuracy of spelling, punctuation, grammar and the use of specialist terminology will be assessed via the indicated 9 mark questions. In each of these questions, three marks are allocated for SPaG as follows:

- **High performance** – 3 marks
- **Intermediate performance** – 2 marks
- **Threshold performance** – 1 mark

Qu	Part	Marking guidance	Total marks
----	------	------------------	-------------

Question 1 The challenge of natural hazards

01	1	<p>One mark for idea of steady increase followed by rapid rise in CO₂ levels/exponential rise.</p> <p>Second mark for use of data shown on graph or for data manipulation, eg CO₂ concentration increased by almost 100 ppm in 150 years.</p> <p>No credit for increase in CO₂ levels without qualification.</p> <p>AO4 = 2 marks</p>	2
----	---	--	---

01	2	<p>Credit one reason only. Valid developed point awarded 2 marks.</p> <p>One mark for appropriate reason, eg</p> <ul style="list-style-type: none"> • burning of fossil fuels (1) • manufacturing of products like cement (1) • deforestation (1). <p>Allow natural factors such as volcanic activity (1).</p> <p>Second mark for developed reason, eg</p> <ul style="list-style-type: none"> • thermal power stations burn fossil fuels which release gases including carbon dioxide which build up in the atmosphere (2). <p>AO2 = 2 marks</p>	2
----	---	---	---

01	3	<p>One mark for each correct answer:</p> <p>C Temperatures over most of the sea areas north of 60° N are expected to increase by 4 °C</p> <p>D Temperatures over the whole of Africa are likely to rise by 3 °C or 4 °C.</p> <p>No credit if three or more statements are shaded.</p> <p>AO4 = 2 marks</p>	2
----	---	--	---

01	4	6
Level	Marks	Description
3 (Detailed)	5–6	<p>AO2 Provides a balanced discussion with well-developed ideas through a detailed understanding of the issue.</p> <p>AO2 Demonstrates thorough understanding of the evidence for increasingly extreme weather in the UK.</p>
2 (Clear)	3–4	<p>AO1 Provides range of accurate knowledge about weather conditions, referring to specific events in the UK over recent years.</p> <p>AO2 Shows a reasonable understanding of the evidence for increasingly extreme weather in the UK</p>
1 (Basic)	1–2	<p>AO1 Shows limited generic knowledge, with little or no specific detail about UK weather events. Answers are not developed.</p> <p>AO2 Demonstrates some understanding of the issue, with random statements about weather conditions, but with limited link to the evidence for increasingly extreme weather.</p>
	0	No relevant content.
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Allow reference to a wide range of extreme weather types, including droughts, severe gales, heavy snowfall and blizzards, hailstorms, thunderstorms, intense rain leading to flooding. • There should be description of specific weather conditions and an indication of how the weather has become more extreme. • Answers may refer to the increasing frequency of these extreme events, the high levels of rainfall, intensity of wind, high temperatures, although these may not be indicative of long-term changes in themselves. • Credit reference to specific extremes of temperatures and rainfall in recent years in the UK. Eg 2003 hot summers; 2010 very low temperatures and much snowfall; 2012 wettest summer on record in England; summers of 2013 and 2014 were amongst the warmest and sunniest in recent years; the Somerset Levels were severely flooded due to heavy persistent rainfall in 2014, with many parts inaccessible for several weeks. <p>AO1 = 2 marks, AO2 = 4 marks</p>		

01	5	<p>One mark for each correct answer.</p> <p>The greatest number of category four tropical storms happen in the Pacific Ocean. (AO3)</p> <p>Apart from very strong winds, one other associated weather feature of a category four storm is heavy rain. (AO2)</p> <p>Rain must be qualified for the mark, eg heavy, intense, torrential, etc.</p> <p>AO2 = 1 mark, AO3 = 1 mark</p>	2
----	---	---	---

01	6	<p>Only one condition is required.</p> <p>Credit a range of answers, eg</p> <ul style="list-style-type: none"> • warm sea temperatures/sea temperatures in excess of 27°C (1) • light winds aloft (1) • winds near the ocean surface blowing from different directions converging (1) • low-wind-shear winds that do not vary greatly with height (1) <p>No credit for high temperatures without qualification.</p> <p>AO1 = 1 mark</p>	1
----	---	--	---

01	7	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">Level</th> <th style="text-align: center;">Mark</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2 (Clear)</td> <td style="text-align: center;">3-4</td> <td> <p>AO3 Demonstrates accurate interpretation of weather conditions through the application of relevant knowledge and understanding to the resource.</p> <p>AO4 Makes clear and effective use of the satellite image to support the forecast of weather conditions.</p> </td> </tr> <tr> <td style="text-align: center;">1 (Basic)</td> <td style="text-align: center;">1-2</td> <td> <p>AO3 Demonstrates some interpretation of weather conditions through the application of limited relevant knowledge and understanding to the resource.</p> <p>AO4 Makes limited and piecemeal use of the satellite image to support the forecast of weather conditions.</p> </td> </tr> </tbody> </table> <p><u>Indicative content</u></p> <ul style="list-style-type: none"> • The weather forecast should relate to the satellite image, so expect reference to the typical sequence of weather conditions associated with the passage of a tropical storm. • Credit any aspects of weather that might realistically occur in the next 24 hours, e.g. cloud cover, precipitation, wind speed and direction, air pressure, humidity, general weather 	Level	Mark	Description	2 (Clear)	3-4	<p>AO3 Demonstrates accurate interpretation of weather conditions through the application of relevant knowledge and understanding to the resource.</p> <p>AO4 Makes clear and effective use of the satellite image to support the forecast of weather conditions.</p>	1 (Basic)	1-2	<p>AO3 Demonstrates some interpretation of weather conditions through the application of limited relevant knowledge and understanding to the resource.</p> <p>AO4 Makes limited and piecemeal use of the satellite image to support the forecast of weather conditions.</p>	4
Level	Mark	Description										
2 (Clear)	3-4	<p>AO3 Demonstrates accurate interpretation of weather conditions through the application of relevant knowledge and understanding to the resource.</p> <p>AO4 Makes clear and effective use of the satellite image to support the forecast of weather conditions.</p>										
1 (Basic)	1-2	<p>AO3 Demonstrates some interpretation of weather conditions through the application of limited relevant knowledge and understanding to the resource.</p> <p>AO4 Makes limited and piecemeal use of the satellite image to support the forecast of weather conditions.</p>										

		<p>conditions.</p> <ul style="list-style-type: none"> • Cloud cover will increase over the next few hours and wind speed will pick up dramatically as the outer part of the vortex approaches. Winds, which will be blowing from the east, may be damaging and there will be torrential downpours of rainfall from dark cumulonimbus clouds. There is a possibility of tornadoes and thunderstorms with lightning. A storm surge combined with the heavy rain may cause dangerous flooding in low-lying coastal areas. Air pressure will drop rapidly. • This will be followed by the centre of the storm or ‘eye’, which will only last for a short time. The weather is likely to be fairly calm with only light winds and fair weather. • The winds will again increase suddenly as the second part of the vortex approaches. This will be accompanied by powerful winds blowing from the west, with further heavy rain. Air pressure will rise as the storm continues northwards, and cloud cover will then become thinner, with more moderate winds. Eventually the rain will cease, although further belts of showers will occur as the storm moves away. <p>The focus is on weather conditions. No credit for describing the structure of the storm, its causes or responses.</p> <p>As the forecast is for 24-hours, allow differing interpretations about how far the tropical storm may move. Credit partial sequence to the top of Level 2 if clear and valid forecast is produced.</p> <p>No credit for descriptions unrelated to the image.</p> <p>Answers must apply understanding of the features of tropical storms to interpret the resource.</p> <p>AO3 = 2 marks, AO4 = 2 marks</p>	
--	--	---	--

01	8	<p>One mark for each reason showing understanding of the frictional effect of moving over the land, eg they pass over land which slows their movement due to friction, or of loss of energy due to cooling effect of passing over water (or land) at higher latitudes, eg they move into areas of cooler water, where there is less energy.</p> <p>No credit for vague statements such as ‘mountains stop them’ or ‘they pass over the sea’.</p> <p>AO2 = 2 marks</p>	2
----	---	---	---

01	9	9
Level	Marks	Description
3 (Detailed)	7–9	<p>AO1 Demonstrates detailed knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the relative significance of primary and secondary effects on people and the environment.</p>
2 (Clear)	4–6	<p>AO1 Demonstrates clear knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the significance of primary and secondary effects on people and the environment.</p>
1 (Basic)	1–3	<p>AO1 Demonstrates limited knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates limited application of knowledge and understanding in evaluating the significance of effects on people and the environment.</p>
	0	No relevant content.
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> The command phrase is ‘to what extent’, so the focus of the question is an evaluation of the relative importance of primary and secondary effects. There should be a discursive element which addresses whether, and to what extent, primary effects are more significant than secondary effects. Credit only effects (not causes or responses). Answers should refer to one of the photo images as well as a named example, although the two do not have to be balanced in coverage. The 		

		<p>distinction should be made between primary impacts, which occur as a direct consequence of the earthquake or volcanic eruption and secondary impacts which occur as a result of the primary effects.</p> <p>Earthquakes Expect details of the event itself with data to support points.</p> <p>Allow wide range of effects, eg</p> <p>Primary effects</p> <ul style="list-style-type: none"> • Collapsing bridges and buildings; homes may be destroyed. • Cracked and twisted roads and other damaged transport links. • Death and injuries to individuals. • Panic and shock of the people affected. <p>Secondary effects</p> <ul style="list-style-type: none"> • Fires caused by broken gas mains and electrical cables; fires develop due to the lack of water from broken pipes. • Tidal waves or tsunamis often result from an earthquake such as the Boxing Day tsunami in 2004 or Japan 2011. • Landslides in steep-sided valleys where the rocks are often weak. • Shops and businesses destroyed. • Tourists put off from visiting areas that had suffered eg Boxing Day tsunami. • Damage to transport and communication links makes trade difficult. • Disease and famine due to lack of clean water and medical facilities. • Death caused by the cold of winter such as in the Kashmir earthquake of 2005. <p>Volcanic eruptions Expect details of the event itself with data to support points.</p> <p>Allow wide range of effects, eg</p> <p>Primary effects</p> <ul style="list-style-type: none"> • The immediate impacts of volcanic gases and lava flows. Hot pyroclastic flows cause death by suffocation and burning. • Tephra falls can cause the collapse of roofs and may destroy homes and farmland. <p>Secondary effects</p> <ul style="list-style-type: none"> • Lahars, landslides, and flooding. This may lead to food/water supply being interrupted. • Disruption to travel. • Homelessness. • Businesses forced to close, and unemployment. • Cost of insurance claims. • Long-term economic issues eg with the tourism industry. • Long-term impacts such as improved soils which may develop 	
--	--	--	--

	<p>over time as the volcanic material is weathered.</p> <p>AO1 = 3 marks, AO2 = 3 marks, AO3 = 3 marks</p> <p>Spelling, punctuation and grammar (SPaG)</p> <p>High performance</p> <ul style="list-style-type: none"> • Learners spell and punctuate with consistent accuracy • Learners use rules of grammar with effective control of meaning overall • Learners use a wide range of specialist terms as appropriate <p>Intermediate performance</p> <ul style="list-style-type: none"> • Learners spell and punctuate with considerable accuracy • Learners use rules of grammar with general control of meaning overall • Learners use a good range of specialist terms as appropriate <p>Threshold performance</p> <ul style="list-style-type: none"> • Learners spell and punctuate with reasonable accuracy • Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall • Learners use a limited range of specialist terms as appropriate <p>No marks awarded</p> <ul style="list-style-type: none"> • The learner writes nothing • The learner’s response does not relate to the question • The learner’s achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning 	<p>3</p> <p>2</p> <p>1</p> <p>0</p>
--	--	---

Question 2 The living world

02	1	<p>One mark for the correct answer:</p> <p>A Most areas of tundra are found on the edges of land masses.</p> <p>No credit if two or more statements are shaded</p> <p>AO4 = 1 mark</p>	1
02	2	<p>Credit statements about distribution of hot deserts using information on the map, eg</p> <ul style="list-style-type: none"> • most of the world's hot deserts lie between 15° and 35° north and south of the equator (1) • several deserts are found on the western side of continents, for example the deserts of South America and southern Africa (1) • the largest desert (the Sahara) stretches across northern Africa into the Middle East (1) • some hot deserts extend much closer to the equator, for instance the Atacama desert on the western side of South America (1). <p>No credit for simply listing continents or places where the deserts are found.</p> <p>AO4 = 2 marks</p>	2
02	3	<p>One mark for the correct answer:</p> <p>C High temperatures all year (25–27 °C), rainfall in every month (1800–2000 mm per year).</p> <p>No credit if two or more statements are shaded.</p> <p>AO1 = 1 mark</p>	1

02	4	<table border="1"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3 (Detailed)</td> <td>5-6</td> <td>AO3 Applies detailed knowledge of rainforest vegetation to interpret the features identified. AO3 Clearly relates characteristic(s) shown in the photograph to the climate of tropical rainforest environments.</td> </tr> <tr> <td>2 (Clear)</td> <td>3-4</td> <td>AO1 Demonstrates accurate knowledge of the features of vegetation and climate to support the explanation. AO4 Makes clear and effective use of the photograph</td> </tr> <tr> <td>1 (Basic)</td> <td>1-2</td> <td>AO1 Demonstrates limited knowledge of vegetation and climate in rainforest areas AO4 Makes limited use of the photograph</td> </tr> <tr> <td></td> <td>0</td> <td>No relevant content.</td> </tr> </tbody> </table>			Level	Marks	Description	3 (Detailed)	5-6	AO3 Applies detailed knowledge of rainforest vegetation to interpret the features identified. AO3 Clearly relates characteristic(s) shown in the photograph to the climate of tropical rainforest environments.	2 (Clear)	3-4	AO1 Demonstrates accurate knowledge of the features of vegetation and climate to support the explanation. AO4 Makes clear and effective use of the photograph	1 (Basic)	1-2	AO1 Demonstrates limited knowledge of vegetation and climate in rainforest areas AO4 Makes limited use of the photograph		0	No relevant content.	6
		Level	Marks	Description																
		3 (Detailed)	5-6	AO3 Applies detailed knowledge of rainforest vegetation to interpret the features identified. AO3 Clearly relates characteristic(s) shown in the photograph to the climate of tropical rainforest environments.																
		2 (Clear)	3-4	AO1 Demonstrates accurate knowledge of the features of vegetation and climate to support the explanation. AO4 Makes clear and effective use of the photograph																
		1 (Basic)	1-2	AO1 Demonstrates limited knowledge of vegetation and climate in rainforest areas AO4 Makes limited use of the photograph																
	0	No relevant content.																		
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Responses should include description and explanation. There should be clear evidence that the photograph has been used, eg the buttress roots of the trees, limited undergrowth, straight trunks. No credit for features not observed in the photograph. • Due to the high rainfall, leaves often have drip tips which allow the water to be channelled to the end and fall so the leaf does not break. Leaf stems are also flexible to allow leaves to move with the sun. • The bark on the trees is thin and smooth to allow free flow of water and because the high temperatures mean that there is no need for protection against cold. • The waxy upper surface of the leaves protects against the heat. • Some plants, such as lianas, climb up the trees to reach sunlight for photosynthesis, while others live on branches in the canopy for the same reason ie epiphytes. • Buttress roots support the trees as they grow incredibly tall (over 50 m in some cases) as there is great competition for sunlight. • Max level 1 for either description or explanation. 																				
<p>AO1 = 2 marks, AO3 = 2 marks, AO4 = 2 marks</p>																				

02	5	<p>One mark for the correct answer: Central America. No credit for stating more than one region.</p> <p>AO4 = 1 mark</p>	1
02	6	<p>One mark for the correct answer: Six/6 (regions).</p> <p>AO4 = 1 mark</p>	1
02	7	<p>Credit one impact only. Impact must be environmental, not economic or social.</p> <p>One mark for stating an impact, eg</p> <ul style="list-style-type: none"> • forest habitats are destroyed (1) • soil erosion increases as the tree cover is removed (1) • burning the rainforest releases CO₂ (1). <p>Second mark for developing the point, eg</p> <ul style="list-style-type: none"> • forest habitats are destroyed leading to reduction and possible decimation of species (2) • soil erosion increases as the tree cover is removed which can cause barren land, flooding and landslides (2) • burning the rainforest releases CO₂ which contributes to world climate change (2). <p>AO2 = 2 marks</p>	2
02	8	<p>Credit one way only. The answer must focus on the international implication of sustainable forest management and show understanding of a worldwide initiative.</p> <p>One mark for stating the method, eg</p> <ul style="list-style-type: none"> • countries can be relieved of some of their debt, known as debt for nature schemes (1) • international organisations such as the Forest Stewardship Council (FSC) promote sustainable forestry (1). <p>Second mark for a developed explanation, eg</p> <ul style="list-style-type: none"> • countries can be relieved of some of their debt, known as debt for nature schemes (1) in return for retaining their rainforest areas (2) • international organisations such as the Forest Stewardship Council (FSC) promote sustainable forestry (1) by guaranteeing that timber products are sourced from sustainable managed forests (2). <p>AO2 = 2 marks</p>	2

02	9	9
Level	Marks	Description
3 (Detailed)	7–9	<p>AO1 Demonstrates comprehensive and accurate knowledge of locations, places and processes in relation to a hot desert/cold environment.</p> <p>AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of a hot desert/cold environment.</p> <p>AO3 Demonstrates thorough application of knowledge and understanding in evaluating the extent to which a hot desert/cold environment provides opportunities and challenges for development.</p>
2 (Clear)	4–6	<p>AO1 Demonstrates clear knowledge of locations, places and processes in relation to a hot desert/cold environment.</p> <p>AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of a hot deserts/cold environment.</p> <p>AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the extent to which a hot desert/cold environment provides opportunities and challenges for development.</p>
1 (Basic)	1–3	<p>AO1 Demonstrates very limited knowledge of locations, places and processes in relation to a hot desert/cold environment.</p> <p>AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of a hot desert/cold environment.</p> <p>AO3 Demonstrates limited application of knowledge and understanding in evaluating the extent to which a hot desert/cold environment provides opportunities and challenges for development.</p>
	0	No relevant content.
<p><u>Indicative content for hot deserts</u></p> <ul style="list-style-type: none"> • The question requires consideration of the extent to which a hot desert area provides both opportunities and challenges. • Answers may focus on the nature of economic opportunities, the scale of development and control over the inhospitable conditions. • Opportunities include resource exploitation relating to 		

		<p>agriculture, recreation and tourism. Economic benefits include employment, spending in the local economy, multiplier effect, and improved infrastructure. Many hot desert environments are increasingly important economically.</p> <ul style="list-style-type: none"> • Challenges include environmental constraints, costs/remoteness, and conflicts with indigenous populations. • Relationships exist between the nature of the challenges and the desire/ability to overcome them in order for development to take place. This might reflect, for example, the value of resources and the technological advances enabling their exploitation. • Support for answers may be based in poorer or richer parts of the world. In HICs, south west US may be used. Economic activity may focus on water supply and how it is managed, provision for commercial farming, mining activity, supplying water, possible provision of a power source to facilitate development, development of tourism on a large scale, building areas for retirement. • In LICs, areas such as the Thar Desert may be cited. Economic activities include subsistence farming, including nomadic pastoralism, and hunter-gathering. Commercial farming supported by irrigation may be emphasised. Resources such as limestone and gypsum are found in this desert, valuable for the building industry. Hydroelectric power is supplied. Tourism is a growing industry. <p>No credit for management of hot desert environments.</p> <p><u>Indicative content for cold environments</u></p> <ul style="list-style-type: none"> • The question requires consideration of the extent to which a cold environment provides both opportunities and challenges. • Answers may focus on the nature of economic opportunities, the scale of development and control over the inhospitable conditions. • Opportunities include resource exploitation, including agriculture, recreation and tourism. Economic benefits include employment, spending in the local economy, multiplier effect, and improved infrastructure. Many cold environments are increasingly important economically. • Challenges include environmental constraints, costs/remoteness, and conflicts with indigenous populations, extreme low temperatures, low precipitation, variable daylight hours, permafrost/active layer, fragile ecosystems, and relief barriers. Construction disrupts and melts the permafrost, creating unstable ground. Exposure to extreme cold can injure and kill, and healthcare may be many miles away. Restricted employment opportunities are a real problem for people living in remote areas, and there is a lack of services due to low population density. Climate change may lead to widespread and rapid changes which are difficult to adapt. • Relationships exist between the nature of the challenges and the desire/ability to overcome them in order for development to take place. This might reflect, for example, the value of 	
--	--	---	--

		<p>resources and the technological advances enabling their exploitation.</p> <ul style="list-style-type: none"> • Credit answers that focus on Arctic or Antarctic regions. Allow reference to tundra as well as polar areas. Support for answers may be based on Northern Canada and/or Alaska. Drilling and mining activities occur, there is considerable hydroelectric power potential, large parts of the coastline offer wind and geothermal energy potential and the region has a large seafood fishing industry. <p>No credit for management of cold environments.</p> <p>AO1 = 3 marks, AO2 = 3 marks, AO3 = 3 marks</p>	
--	--	--	--

Question 3 Coastal landscapes in the UK

03	1	One mark for the correct answer: B 669421. No credit if two or more answers shaded. AO4 = 1 mark	1
03	2	One mark for the correct answer: B 2.4 km. No credit if two or more answers shaded. AO4 = 1 mark	1
03	3	Accept reference to the effect of: <ul style="list-style-type: none">• direction of dominant waves (1)• differences in offshore gradient (1)• differences in rock type and gradient, eg some rocks are stronger than others resisting wave attack (1)• structural differences, eg faulting and jointed structures (1). Answers must apply understanding of coastal factors to interpret the resource. No credit for description of the coastal features or for explanations relating to different types of waves. AO3 = 1 mark	1
03	4	One mark for the correct answer: B North west. No credit if two or more answers are shaded. AO4 = 1 mark	1

03	5	<p>The process only has to be named. There is no requirement to explain or describe the process. Likely to state hydraulic power (action) (1) or abrasion (corrosion) (1).</p> <p>Allow solution or corrosion. No credit for attrition.</p> <p>AO1 = 1 mark</p>	1
----	---	---	---

03	6	<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;">Level</th> <th style="text-align: center;">Marks</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2 (Clear)</td> <td style="text-align: center;">3–4</td> <td> <p>AO2 Demonstrates clear understanding of how coastal defence(s) work in defending the coast.</p> <p>AO3 Application is sound with clear interpretation of the strategies shown in the photograph.</p> </td> </tr> <tr> <td style="text-align: center;">1 (Basic)</td> <td style="text-align: center;">1–2</td> <td> <p>AO2 Shows limited understanding of how the coastal defence(s) work.</p> <p>AO3 Application is limited with basic interpretation of the strategy(ies) shown in the photograph.</p> </td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td>No relevant content.</td> </tr> </tbody> </table> <p><u>Indicative content</u></p> <ul style="list-style-type: none"> • (Curved) sea walls reflect the energy of the waves back to the sea. They protect the base of cliffs, land and buildings against erosion and can prevent coastal flooding in some areas. • Rock armour consists of large boulders piled up on the beach. These absorb the energy of waves and may allow the build-up of a beach. <p>No credit for simply identifying the type of sea defence or for describing other hard (or soft) engineering strategies.</p> <p>AO2 = 2 marks, AO3 = 2 marks</p>	Level	Marks	Description	2 (Clear)	3–4	<p>AO2 Demonstrates clear understanding of how coastal defence(s) work in defending the coast.</p> <p>AO3 Application is sound with clear interpretation of the strategies shown in the photograph.</p>	1 (Basic)	1–2	<p>AO2 Shows limited understanding of how the coastal defence(s) work.</p> <p>AO3 Application is limited with basic interpretation of the strategy(ies) shown in the photograph.</p>		0	No relevant content.	4
Level	Marks	Description													
2 (Clear)	3–4	<p>AO2 Demonstrates clear understanding of how coastal defence(s) work in defending the coast.</p> <p>AO3 Application is sound with clear interpretation of the strategies shown in the photograph.</p>													
1 (Basic)	1–2	<p>AO2 Shows limited understanding of how the coastal defence(s) work.</p> <p>AO3 Application is limited with basic interpretation of the strategy(ies) shown in the photograph.</p>													
	0	No relevant content.													

03	7	<table border="1"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3 (Detailed)</td> <td>5-6</td> <td>AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown. AO3 Makes full analysis of the resource, using evidence to support response.</td> </tr> <tr> <td>2 (Clear)</td> <td>3-4</td> <td>AO1 Demonstrates specific and accurate knowledge of processes and landforms in depositional coastal environments. AO2 Shows clear geographical understanding of the interrelationships between coastal environments and processes.</td> </tr> <tr> <td>1 (Basic)</td> <td>1-2</td> <td>AO1 Demonstrates some knowledge of processes in depositional coastal environments. May be limited to an explanation of longshore drift and other processes only. Alternatively the account may be descriptive and be confined to landform appearance and structure. AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes.</td> </tr> <tr> <td></td> <td>0</td> <td>No relevant content.</td> </tr> </tbody> </table>			Level	Marks	Description	3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown. AO3 Makes full analysis of the resource, using evidence to support response.	2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of processes and landforms in depositional coastal environments. AO2 Shows clear geographical understanding of the interrelationships between coastal environments and processes.	1 (Basic)	1-2	AO1 Demonstrates some knowledge of processes in depositional coastal environments. May be limited to an explanation of longshore drift and other processes only. Alternatively the account may be descriptive and be confined to landform appearance and structure. AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes.		0	No relevant content.	6
		Level	Marks	Description																
		3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown. AO3 Makes full analysis of the resource, using evidence to support response.																
		2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of processes and landforms in depositional coastal environments. AO2 Shows clear geographical understanding of the interrelationships between coastal environments and processes.																
		1 (Basic)	1-2	AO1 Demonstrates some knowledge of processes in depositional coastal environments. May be limited to an explanation of longshore drift and other processes only. Alternatively the account may be descriptive and be confined to landform appearance and structure. AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes.																
	0	No relevant content.																		
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Responses should analyse the map, finding connections and providing a logical chain of reasoning. • The question implies knowledge of the processes of transportation and deposition as well as landform(s) of deposition. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation. • In the specification the relevant landforms are beaches, spits and bars, but credit other variations such as tombolos and barrier islands. • The landforms are created by the process of longshore drift. Some eroded material is up caught up within the waves and is carried by the sea along the coastline. Material is carried along the shore in a zigzag fashion by waves as they swash material up the beach at an angle and backwash material down the beach at a right angle. The angle of swash is determined by the prevailing wind. On the map the direction is from west to east as shown by the prevailing wind, and the shape and growth of the spit. • Credit processes of transportation such as traction, saltation and suspension. • Allow labelled diagrams as part of the explanation of processes and landforms. • Spits are formed by longshore drift in areas of relatively shallow and sheltered water where there is a change in the direction of the coastline. Deposition occurs, resulting in the accumulation 																				

		<p>of sand and shingle. The material initially deposited is the largest material, dropped due to the reduction in energy.</p> <ul style="list-style-type: none"> • A bay bar may develop across the entrance to a bay and eventually join two headlands due to transport of sediment by longshore drift. • Beaches are areas of sand, pebbles and shingle that are formed by deposition produced by wave processes and by longshore drift. Gently sloping beaches are formed by strong destructive waves that backwash more material away from the beach than they swash up the beach. Steeply sloping beaches are formed by constructive waves that swash more material up the beach than they backwash away, building up a steep beach gradient. <p>AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 marks</p>	
--	--	---	--

Question 4 River landscapes in the UK

04	1	<p>One mark for identifying appropriate characteristic evident in grid square 4754, eg</p> <ul style="list-style-type: none"> the river meanders (1) the river flows from south west to north east across the area of the grid square (1). <p>No credit for features of the river banks, eg levées, or the surrounding floodplain.</p> <p>AO4 = 1 mark</p>	1
04	2	<p>One mark for the correct answer:</p> <p>32 metres (m). Must include units.</p> <p>AO4 = 1 mark</p>	1
04	3	<p>One mark for statements which show understanding of the gradient of the river, eg concave shape/steep in the upper course (1), gentler slope in lower course (1).</p> <p>No credit for statements about the cross profile, eg steep banks at the beginning, flatter in the lower course.</p> <p>AO4 = 1 mark</p>	1
04	4	<p>Answers must suggest one reason for the decrease in slope angle of valley sides, based on an interpretation of the information provided, eg</p> <ul style="list-style-type: none"> the valley sides become less steep because of the effects of mass wasting and weathering (1) near the source the river cuts downwards, but further downstream it is eroding laterally (1). <p>No credit for description of changes in valley profile between A and B.</p> <p>AO3 = 1 mark</p>	1
04	5	<p>One mark for showing the general idea of attrition, eg</p> <ul style="list-style-type: none"> particles in the river may collide with each other (attrition) (1) gradually become smaller in size (1). <p>No credit for answers that do not explain the mechanism, eg rocks break up.</p> <p>AO1 = 1 mark</p>	1

04	6	4
Level	Marks	Description
2 (Clear)	3–4	<p>AO2 Shows clear understanding of how river flooding has economic effects.</p> <p>AO3 Demonstrates application of knowledge and understanding make full interpretation of the photograph, suggesting likely economic effects in the area shown.</p>
1 (Basic)	1–2	<p>AO2 Shows limited understanding of how river flooding has economic effects.</p> <p>AO3 Demonstrates application of knowledge and understanding to make limited interpretation of the photograph, suggesting possible economic effect(s) in the area shown.</p>
	0	No relevant content.
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • The focus of the question must be on the economic effects of river flooding. Direct interpretation of the photograph is required. • Damage to property, which may be very costly to repair. High costs of temporary rehousing and additional travel. • Decline in the local economy as businesses are unable to operate without power or road connections. • Unemployment may increase if businesses are unable to fully recover from a flood. • Disruption to agriculture as fields are flooded, crops submerged under water and livestock stranded or drowned. • Communities are cut off from normal supplies-people are unable to travel to shops and services, or to reach work. • Closure of roads may mean extensive detours for other traffic, which is expensive and time consuming. • Huge cost of floods to insurers, resulting in rising premiums. <p>No credit for effects that cannot be reasonably deduced from the photograph, or for social and environmental effects, unless there is a related economic impact.</p> <p>AO2 = 2 marks, AO3 = 2 marks</p>		

04	7	<table border="1"> <thead> <tr> <th>Level</th> <th>Marks</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>3 (Detailed)</td> <td>5-6</td> <td>AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown AO3 Makes full analysis of the resource, using evidence to support response.</td> </tr> <tr> <td>2 (Clear)</td> <td>3-4</td> <td>AO1 Demonstrates specific and accurate knowledge of river processes and environments. AO2 Shows thorough geographical understanding of the interrelationships between river environments and processes.</td> </tr> <tr> <td>1 (Basic)</td> <td>1-2</td> <td>AO1 Demonstrates some knowledge of river processes and environments. AO2 Shows limited geographical understanding of the interrelationships between environments and processes.</td> </tr> <tr> <td></td> <td>0</td> <td>No relevant content.</td> </tr> </tbody> </table>			Level	Marks	Description	3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown AO3 Makes full analysis of the resource, using evidence to support response.	2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of river processes and environments. AO2 Shows thorough geographical understanding of the interrelationships between river environments and processes.	1 (Basic)	1-2	AO1 Demonstrates some knowledge of river processes and environments. AO2 Shows limited geographical understanding of the interrelationships between environments and processes.		0	No relevant content.	6
		Level	Marks	Description																
		3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown AO3 Makes full analysis of the resource, using evidence to support response.																
		2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of river processes and environments. AO2 Shows thorough geographical understanding of the interrelationships between river environments and processes.																
		1 (Basic)	1-2	AO1 Demonstrates some knowledge of river processes and environments. AO2 Shows limited geographical understanding of the interrelationships between environments and processes.																
	0	No relevant content.																		
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Responses should analyse the photograph, finding connections and providing a logical chain of reasoning. • The question implies knowledge of fluvial processes, and their interrelationship with the landform(s) created. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation. • Processes include the erosional processes of hydraulic action and abrasion or corrasion. Erosion is most rapid during powerful flood events. Credit transportation processes such as traction and saltation as well as processes of deposition as evidenced in the large debris to the right of the channel in the foreground. Mass movement processes may be relevant in the context of valley formation. • A waterfall with plunge pool, and a steep sided valley or gorge is clearly visible. Credit reference to the more gently sided valley in the background, above the waterfall. • Explanation will refer to geology where horizontal bands of hard and soft rock are crossed by the river as it flows down the long profile. The hard rock is on top – the cap rock. This leads to differential erosion as the underlying soft rock is eroded faster than the overlying hard rock via abrasion and hydraulic action. Over time, the soft rock is gouged out to leave an overhang as the profile is steepened. This will be unable to support its weight and will collapse into the plunge pool providing further material for erosion and the deepening of the waterfall. Over many centuries, the waterfall may retreat to form a gorge of recession. <p>AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 marks</p>																				

Question 5 Glacial landscapes in the UK

05	1	<p>One mark for the correct answer: A glacial trough. No credit if two or more answers shaded. AO4 = 1 mark</p>	1
5	2	<p>One mark for the correct answer: C 6252. No credit if two or more answers shaded. AO4 = 1 marks</p>	1
05	3	<p>One mark for the correct answer: Glaslyn. AO4 = 1 mark</p>	1
05	4	<p>The answer requires application of knowledge and understanding to interpret photographic evidence.</p> <p>Credit two separate points or a single developed reason, eg</p> <ul style="list-style-type: none"> • rocks may be broken by frost shattering (1) • the rocks are well jointed, so may break up along lines of weakness as people walk on them (1) • water penetrates cracks during the day, then freezes and expands at night. This freeze-thaw process is repeated many times, causing the rocks to fracture (2). <p>AO3 = 2 marks</p>	2

05	5	4
Level	Marks	Description
2 (Clear)	3–4	<p>AO2 Shows sound geographical understanding of the interrelationships between places, physical environments and processes in the context of upland glaciated areas.</p> <p>AO3 Applies knowledge and understanding of the pressures of tourism in glacial environments by interpreting photographic evidence.</p>
1 (Basic)	1–2	<p>AO1 Demonstrates knowledge of glacial environments and recreational/tourist pressures.</p> <p>AO2 Shows some geographical understanding of the interrelationships between places, glacial environments and processes.</p>
	0	No relevant content.
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • The focus is on pressures on the physical environment, with no credit for effects on the economy or local community. Command word is 'suggest', so any reasonable effects in the environment shown may be credited. Answers should make specific use of the photographs with developed explanation of the environmental effects of tourism. • Expect reference to footpath erosion, air and water pollution, and visual intrusiveness as might be implied in the photographs. Credit other environmental factors such as noise pollution and effects on farmland. • Congestion and air pollution from cars is likely to be an issue, caused by the huge number of people who visit in the summer. • People may park on grass verges in desperation, narrowing the road and making congestion even worse. • Too much recreational activity may damage fragile environments – footpath erosion causes the soil to become eroded and be washed away, which can interfere with flora and fauna. • The noise from water sports such as jet skis can disturb fishing. These may also leak oil and fuel, causing harm to aquatic life and polluting the water for other users. <p>AO1 = 1 mark, AO2 = 2 marks, AO3 = 1 mark</p>		

05	6	6
Level	Marks	Description
3 (Detailed)	5–6	<p>AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown</p> <p>AO3 Makes full analysis of the resource, using evidence to support response.</p>
2 (Clear)	3–4	<p>AO1 Demonstrates specific and accurate knowledge of processes taking place and the resultant landforms in glacial environments.</p> <p>AO2 Shows sound geographical understanding of the interrelationships between environments and processes.</p>
1 (Basic)	1–2	<p>AO1 Demonstrates some knowledge of processes operating and the resultant landforms in glacial environments.</p> <p>AO2 Shows limited geographical understanding of the interrelationships between environments and processes.</p>
	0	No relevant content.
<p><u>Indicative content</u></p> <ul style="list-style-type: none"> • Responses should analyse the diagram, finding connections and providing a logical chain of reasoning. • Credit reference to different types of moraine, but allow explanation of other landforms of deposition. The specification includes drumlins and erratics, but credit other landforms such as till plain or outwash plain. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation in relation to the chosen landforms. • Processes include freeze-thaw on mountain slopes, various forms of mass movement, and erosional processes of plucking and abrasion, all of which contribute to the creation of morainic debris. Transport processes are relevant as are processes of deposition under the ice (subglacial), on top of the ice (supraglacial), alongside the glacier and ahead of the glacier snout (proglacial). The focus is on different landforms, so explanation of two is sufficient to reach the top of Level 2. • Lateral moraine forms along the edges of the glacier. Material from the valley walls is broken up by frost shattering and falls onto the ice surface. It is then carried along the sides of the glacier. When the ice melts it forms a ridge of material along the valley side. Medial moraine is formed from two lateral moraines. When two glaciers merge, the two edges that meet form the centre line of the new glacier. As a result two lateral moraines join in the middle of the glacier forming a line of material on the glacier surface. The existence of a medial 		

	<p>moraine is evidence that the glacier has more than one source. When the ice melts it forms a ridge of material along the valley centre. Terminal moraine forms at the snout of the glacier. It marks the furthest extent of the ice, and forms across the valley floor. The ice scratches and scrapes the bed by a process of abrasion, generating large amounts of fine material added to by larger blocks plucked from the bed. This material is transported to the glacier snout where it is dumped in huge mounds across the valley. It is usually the feature that marks the end of unsorted deposits and the start of water sorted material.</p> <ul style="list-style-type: none"> • Credit the formation of other relevant landforms such as till plains (behind the moraines) and outwash plains (in front of the moraines). Glacial till is the sediment moved directly by the ice. This material is unsorted. Glacial outwash is the sediment deposited (or redeposited) by melt-water from the glacier. Drumlins are formed by glacial ice acting on underlying unconsolidated till or ground moraine. <p>No credit for only describing the features, location or position of moraines and other landforms of deposition.</p> <p>AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 marks</p>	
--	--	--

aqa.org.uk

Copyright © 2015 AQA and its licensors. All rights reserved.
AQA Education (AQA) is a registered charity (registered charity number 1073334) and a company limited by guarantee registered in England and Wales (company number 3644723). Registered address: AQA, Devas Street, Manchester M15 6EX

16 February 2016