DRAFT SPECIMEN
MARK SCHEME

GCSE
GEOGRAPHY

PAPER 1 LIVING WITH THE PHYSICAL ENVIRONMENT

Mark scheme

Specimen Assessment Material

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 (SPGST)
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 SPGST as follows:

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

NOTE: The exam boards and Ofqual are working together to determine the marking expectations for spelling, punctuation, grammar and specialist terminology (SPGST) which will apply to all GCSE specifications in History, Geography and Religious Studies. The agreed wording will be included in the mark schemes for accredited sample assessment materials.

Qu	Part	Marking guidance	Total marks

Question 1 The challenge of natural hazards

01	1	One mark for idea of steady increase followed by rapid rise in CO_2 levels/exponential rise. Second mark for use of data shown on graph or for data manipulation, eg CO_2 concentration increased by almost 100 ppm in 150 years. No credit for increase in CO_2 levels without qualification. AO4 = 2 marks	2

01	2	Credit one reason only. Valid developed point awarded 2 marks. One mark for appropriate reason, eg • burning of fossil fuels (1) • manufacturing of products like cement (1) • deforestation (1). Allow natural factors such as volcanic activity (1). Second mark for developed reason, eg • thermal power stations burn fossil fuels which release gases including carbon dioxide which build up in the atmosphere. AO2 = 2 marks	2

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

01	4		6

Level	Marks	Description
2 (Clear)	4–6	Linked statements with reference to specific events in the UK over recent years. There should be description of weather conditions and an indication of how the weather has become more extreme.

		Provides a reasonable description demonstrating clear knowledge and understanding.
1 (Basic)	1–3	Simple generic information with limited or no specific detail about the UK. Answers not developed. There may be random statements about weather conditions /events but limited link to the evidence for increasingly extreme weather. Demonstrates some knowledge and understanding but the description is limited and lacks specific information.

Indicative content

There should be some specific evidence to access level 2. 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. Answers may refer to the increasing frequency of these extreme events, the high levels of rainfall, intensity of wind and high temperatures, although these may not be indicative of long-term changes in themselves etc.

Credit reference to extremes of temperatures and rainfall in recent years in the UK. In 2003 it was very hot and in the winters of 2010 there were very low temperatures and a lot of snow fell. 2012 had the wettest summer on record in England and the summers of 2013 and 2014 were amongst the warmest and sunniest in recent years. During 2003-06 the UK received below average rainfall. In 2007 and 2008 there was flooding in Gloucestershire and northern England and several cities were flooded including Sheffield and Hull. Boscastle in Cornwall, (2004) Tewkesbury in Gloucestershire (2013) and Cockermouth in Cumbria all had large numbers of houses flooded. The Somerset Levels were severely flooded in 2014, with many parts inaccessible for several weeks.

Credit specific case study evidence where relevant, eg December 2010 winds from the north-east brought cold arctic air and snow. Scotland and North East England were significantly affected, with snow 50 cm deep in places. Temperatures were mainly below 0°C, making it the coldest December in the last 100 years. Roads were closed. People were stranded in their cars overnight on the M8 and A9 in Scotland. Airports and schools were closed, including Heathrow and Gatwick, disrupting travel plans over Christmas. On 20 December the AA reported its busiest-ever day because of car breakdowns. More people than usual were admitted into hospital because of accidents and falls. Emergency services and local authorities were all put under pressure. After areas thawed, there were problems with burst water pipes. In Northern Ireland 40,000 homes were without water.

AO1 = 2 marks, AO2 = 4 marks

01	5	One mark for each correct answer. Tropical storms are more common in the **northern** hemisphere. The greatest number of category four tropical storms happen in the **Pacific** Ocean. AO2 = 1 mark, AO3 = 1 mark	2

01	6	Credit a range of answers, eg • warm sea temperatures/sea temperatures in excess of 27° (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) Only one factor is required. No credit for high temperatures without qualification. AO2 = 1 mark	1

01	7	2x2 Two separate features should be described. The description should relate to the satellite image. Allow references to the structure and size. Descriptions may be simple statements for one mark, eg • The tropical storm has a circular shape. • There is a vortex. • The storm has an eye. • It is about 1000km across. Credit developed descriptions for two marks, eg • The storm has a circular shaped eye in the centre surrounded by a vortex of cloud. • The cloud appears to be spinning in an anticlockwise direction inwards towards the centre. It becomes more patchy with distance from the eye. • The main part of the hurricane is about 1000km from west to east, although there is further cloud over Florida and Central America that may be part of the storm. No credit for descriptions unrelated to the image. AO3 = 2 marks, AO4 = 2 marks	4

01	8	One mark for showing understanding of the frictional effect of moving over the land, eg they pass over land which slows their movement due to friction. One mark for statement that shows understanding of loss of energy	2

		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. No credit for vague statements such as ‘mountains stop them’ or ‘they pass over the sea’. AO1 = 1 mark, AO2 = 1 mark	

01	9	<table><tr><th>Level</th><th>Marks</th><th>Description</th></tr><tr><td>3 (Detailed)</td><td>7–9</td><td>Primary and secondary impacts are considered. There is specific reference to the named case study. Statements are developed, linked and logically ordered. Clear detailed description that distinguishes between primary and secondary effects. Several effects are covered, including impacts on people and property. Locational context is specific. Clear structure, well communicated and with good use of specialist geographical terminology. Knowledge of primary and secondary effects is accurate and is used to support the description. Understanding is thorough and effective. Includes good application of knowledge and understanding to interpret geographical information. Makes full use of the photograph to support response. The answer is detailed, coherent and focused.</td></tr><tr><td>2 (Clear)</td><td>4–6</td><td>Linked or developed statements with reference to a tectonic event. Starts to distinguish between primary and secondary effects, although the differences may be inferred rather than explicit. Several effects are covered, at least one with some development. Location is recognisable. Some structure, clearly communicated, but with limited use of geographical terminology. Shows reasonable knowledge and understanding of the effects of a tectonic event, but some weaknesses may be present. Includes some application of knowledge and understanding to interpret geographical information. Makes reasonable use of the</td></tr></table>	9

		photograph to support response. The answer is clear, developed and reasonably accurate.
1 (Basic)	1–3	Simple statements with no name of case study or largely generic account. Likely to consider either primary and secondary impacts only or not distinguish between these. Statements may be brief and separate in a random order. The response may state at least one primary and/or one secondary impact, but with little accuracy or detail. Location is vague or absent. Limited structure to answer and basic use of geographical terminology. Knowledge of primary and secondary effects is limited. Understanding is poorly focused or absent. Includes very little application of knowledge and understanding to interpret geographical information. Makes some use of the photograph to support response. The answer is basic, poorly developed and partial.

<u>Indicative content</u>
Credit only effects (not causes or responses). Answers should refer to one of the photo images as well as a named case study, although the two do not have to be balanced in coverage. The 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. Answers may also be credited that explain environmental, social and economic impacts.

Earthquakes

Earthquakes can destroy settlements and kill many people. Aftershocks can cause even more damage to an area.

Allow wide range of impacts, eg

Primary effects

- Collapsing bridges and buildings; homes may be destroyed
- Cracked and twisted roads and other transport links
- Death and injuries to individuals
- Panic and shock of the people affected

Secondary effects

		• 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 • 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 Economic impacts – eg many tourists were put off from visiting areas that had suffered due to the Boxing Day tsunami. The command word is to describe, not just to identify, so there should be development of the effects – the nature of buildings pancaking or double decker highways falling; the dangers of falling materials such as shattered glass. **Volcanic eruptions** Expect details of the event itself with data to support points. Primary effects of a volcanic eruption include the immediate impacts of volcanic gases, lava flows, pyroclastic flows and tephra which may destroy homes and farmland. Secondary effects of a volcanic eruption include lahars, landslides, and flooding. This may lead to food / water supply being interrupted, disruption to travel, homelessness, businesses forced to close, cost of insurance claims, unemployment, and long-term issues with the tourism industry. Allow long-term impacts such as improved soils which may develop over time as the volcanic material is weathered. The command word is to describe, not just to identify, so there should be development of the effects. AO1 = 3 mark, AO2 = 3 marks, AO3 = 3 marks **Spelling, punctuation, grammar and use of specialist terminology (SPGST)** **High performance** In the context of the level of demand of the question, learners spell, punctuate and use grammar with consistent accuracy and also use	**3**

		specialist terminology with consistent accuracy. **Intermediate performance** In the context of the level of demand of the question, learners spell, punctuate and use grammar with considerable accuracy and also use specialist terminology with considerable accuracy. **Threshold performance** In the context of the level of demand of the question, learners spell, punctuate and use grammar with reasonable accuracy and also use specialist terminology with reasonable accuracy; any errors do not hinder meaning in the response.	**2** **1**

Question 2 Coastal landscapes in the UK

02	1	One mark for each correct answer: Wave cut platform: **B** 669421 Headland: **D** 670397 Beach: **A** 673398 No credit for each feature that has two or more answers shaded. AO4 = 3 marks	3

02	2	One mark for the correct answer: **B** North west No credit if two or more answers are shaded. AO4 = 1 mark	1

02	3	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 (corrasion) (1). Allow solution or corrosion. No credit for attrition. AO1 = 1 mark	1

02	4		4

Level	Marks	Description
2 (Clear)	3–4	Linked and developed statements with explanation of how the coastal defences help to reduce erosion and/or flooding. May access level 2 for explaining how one method works in defending the coast.

		May refer to cliff defence and/or flood defence. Expect some specific reference to the photograph, recognising the strategy/strategies used in this environment. Shows sound understanding of how coastal defence method(s) work. One or more appropriate types of coastal management methods. Application is thorough with clear interpretation of the photograph. The answer as a whole is competent and accurate.
1 (Basic)	1–2	Simple statements with little development or explanation. There must be an indication of how the method works, not just a named type of sea defence. The response attempts to describe at least one hard engineering technique but with little accuracy or detail. The response may not be well focused on hard engineering schemes. Limited structure to answer. Shows limited understanding of how coastal defences work. Application is limited or absent, with basic interpretation of the photograph. The answer as a whole lacks clarity and may have some inaccuracies.
	0	No relevant content.

<u>Indicative content</u>
Allow reference to other types of hard engineering, such as revetments, gabions or groynes. 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.

No credit for simply identifying the type of sea defence or for describing soft engineering strategies.

AO2 = 2 marks, AO3 = 2 marks

02	5	**Level**	**Marks**	**Description**
		2 (Clear)	4–6	Linked statements showing some understanding of the processes. The formation of one landform should be clearly explained. There should be some indication that the figure has been used, directly or indirectly.

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		Demonstrates specific and accurate knowledge of processes and environments. Shows sound geographical understanding of the inter-relationships between environments and processes. Includes good application of knowledge and understanding to interpret geographical information. Makes competent use of source to support response.
1 (Basic)	1–3	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. Likely to be simple random statements with limited understanding or organisation. May use figure to identify landforms of deposition. Credit formation of only one landform. If more than one landform is explained credit the most convincing explanation. Demonstrates some knowledge of processes and environments. Shows limited geographical understanding of the inter-relationships between environments and processes. Includes basic application of knowledge and understanding to interpret geographical information. Makes little or no use of source to support response.
	0	No relevant content.

<u>Indicative content</u>
The question implies knowledge of the processes of transportation and deposition as well as one landform 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 allow other variations such as tombolos and barrier islands.

The landforms are created by the process of longshore drift. Some eroded material ends 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 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 of sand and shingle. The material initially deposited is the largest material, dropped due to the reduction in energy. 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 that they swash up the beach. Steeply sloping beaches occur by constructive waves that swash more material up the beach than they backwash away, building up a steep beach gradient. No credit for explanation of additional landforms AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 mark	

Question 3 River landscapes in the UK

03	1	One mark for statements which show understanding of the gradient of the river, eg concave shape/steep in the upper course, gentler slope in lower course. No mark for statements about the cross profile, eg steep banks at the beginning, flatter in the lower course. AO4 = 1 mark	1

03	2	Answers must give reason(s) for the decrease in slope angle of valley sides. Credit developed point for 2nd mark. Credit basic idea for one mark, eg • the valley sides become less steep because of the effects of mass wasting and weathering (1). Developed point for two marks, eg • near the source, the river has a lot of material and energy, so it cuts downwards, creating a steep-sided v-shaped valley. Further downstream the river cuts sideways or laterally, and the valley slopes become gentler (2). No credit for description of changes in valley profile between A and B.	2

		AO3 = 1 mark, AO4 = 1 mark	

03	3	One mark for showing the general idea of attrition, eg particles in the river may collide with each other (attrition) and gradually become smaller in size. No credit for answers that do not explain the mechanism, eg rocks break up. AO3 = 1 mark	1

03	4	Answers must give a reason, eg: • tributaries join the river as it flows downstream (1) • water reaches the river from surface runoff, groundwater and throughflow (1). No credit for description of changes in discharge based on data. AO1 = 1 mark	1

03	5		4

Level	Marks	Description
2 (Clear)	3–4	Linked and developed statements with explanation of how one or more strategies of river management can help to reduce the effects of river flooding. May access level 2 by explaining how one method works in reducing the effects of flooding. Expect some use of the photograph, recognising appropriate strategies in this environment. Shows sound understanding of how river management method(s) work. Clear use of the photograph to investigate geographical question. The answer as a whole is competent and accurate. May refer to named areas with flood defence schemes but this is not essential.
1 (Basic)	1–2	Demonstrates limited knowledge and understanding. Explains one or more simple ideas. Gives a basic explanation of one or more method(s) used to manage flooding.

		Shows limited understanding of how river management method(s) work. Basic use of the photograph to investigate geographical question. Points lack development or depth. The answer is basic and lacks clarity.	
	0	No relevant content.	

<u>Indicative content</u>
The focus of the question can be on hard or soft engineering. Flood management methods could include levées or flood barriers, river straightening, deepening and diversion and dam construction to control flow.

In the area shown on the photograph levées or artificial embankments could be built along the rivers to keep water in the channel and stop flooding. The channels could be dredged more regularly so that more water remains there and diversion channels could be constructed to take water away from settlements.

Allow soft engineering methods such as monitoring of precipitation/discharge for flood warning system, restricting development on floodplains, afforestation of catchment areas, increased green space in urban areas, education/awareness of public.

Land use zoning means that land next to the river may be used as farmland or recreational use, but buildings are not allowed. This reduces the impact of flooding.

AO2 = 2 marks, AO4 = 2 marks

03	6	**Level**	**Marks**	**Description**	6
		2 (Clear)	4–6	One landform explained, with detail of sequence and process, although coverage may be unbalanced. Clear reference to a landform evident in the photograph. Demonstrates specific and accurate knowledge of processes and environments. Shows sound geographical understanding of the inter-relationships between environments and processes. Includes good application of knowledge and understanding to interpret geographical information. Makes competent use of source to support response.	
		1 (Basic)	1–3	Simple statements about a landform. Sequence may be incomplete or mixed up.	

		Limited or no coverage of process. Credit formation of only one landform. If more than one landform is explained credit the most convincing explanation. Demonstrates some knowledge of processes and environments. Shows limited geographical understanding of the inter-relationships between environments and processes. Includes very limited application of knowledge and understanding to interpret geographical information. Makes little or no use of source to support response.
	0	No relevant content.

<u>Indicative content</u>
The photograph shows a range of landforms, including meanders and floodplains. Allow reference to levées although less clear on the image. Sequence and process should be integrated in explanation of specific landforms.

Meanders are formed where there are shallow and deep sections in the river channel. Gradually the meander increases in size as the outer bend is eroded quickly, by processes of abrasion and hydraulic power. The outer bend is usually much deeper than the inside bend or slip off slope where water travels slowly and deposition may take place.

Floodplains develop when the river floods and the silt builds up on either side of the river. The enlargement of the meander wears away the valley floor to widen the valley, and the meanders migrate downstream making a continuous area of fairly flat land called a floodplain, with valley bluffs rising quite steeply on either side.

No credit for pure description of features shown on the photograph.

No credit for features not shown eg oxbow lakes.

AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 mark

Question 4 Glacial landscapes

04	1	One mark for each correct answer: Grid reference: 653532 **A** glacial trough Grid reference: 616546 **A** corrie lake No credit for each grid reference that has two or more answers shaded. AO4 = 2 marks	2

04	2	Glaslyn AO4 = 1 mark	1

04	3	Credit only description. No marks for explanation of formation or details of processes. A minimum of two features should be described, eg • The arête is steep sided (1). • It is narrow/sharp at the top (1). • The surface is uneven and jagged(1). • It has many loose rocks/boulders (1). AO3 = 2 marks	2

04 4 — 4

Level	Marks	Description
2 (Clear)	3–4	Specific use of the photographs with developed explanation of the environmental effects of tourism. May develop other ideas from own knowledge. Shows thorough geographical understanding of the inter-relationships between places, physical environments and processes in the context of upland glaciated areas. Uses skills and techniques effectively to investigate questions and issues.
1 (Basic)	1–2	Random or general statements which may not refer to the photographs. Simple points, perhaps a list of pressures on the environment. Limited or incomplete explanation. Demonstrates slight knowledge of environments. Shows some geographical understanding of the inter-relationships between places, physical

		environments and processes.
	0	No relevant content.

Indicative content

The focus is on pressures on the physical environment, with no credit for effects of the economy or local community.

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.

AO1 = 1 mark, AO2 = 2 marks, AO4 = 1 mark

04	5	**Level**	**Marks**	**Description**	6
		2 (Clear)	4–6	Linked statements with clear detail of the processes of formation. Process and sequence are integrated. Demonstrates specific and accurate knowledge of processes and environments. Shows sound geographical understanding of the inter-relationships between environments and processes. Includes good application of knowledge and understanding to interpret geographical information. Makes competent use of source to support response.	
		1 (Basic)	1–3	Basic or random statements with limited integration of sequence and process. May explain formation generically. Credit formation of only one landform. If more than one landform is explained credit the most convincing explanation. Demonstrates some knowledge of processes and environments. Shows limited geographical understanding of the inter-relationships between environments and processes. Includes very limited application of knowledge and understanding to interpret geographical	

		information. Makes little or no use of source to support response.
	0	No relevant content.

Indicative content

Credit reference to one type of moraine. Max level 1 if only one type is explained. Expect explanation of process and sequence in relation to the chosen type of moraine.

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 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.

No credit for only describing the features, location or position of the moraine.

AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 marks

Question 5 The living world

05	1	One mark for the correct answer: **A** Most areas of tundra are found on the edges of land masses. No credit if two or more statements are shaded AO4 = 1 mark	1

05	2	The emphasis is on comparison, including differences between the two distributions. Maximum 2 marks for separate descriptions unless differences/similarities are implied. • Tropical rainforests are found within the tropics, generally close to the equator (1), whereas the hot deserts extend north and south beyond the two tropics (1). • Hot deserts are mainly between 15 and 35 degrees north and south of the equator (1), whereas the tropical rainforests are generally within 10 degrees north and south (1). • Some hot deserts are found at the same latitude as rainforests, eg in South America (1), but are found on different sides of the continent (west as opposed to east) (1). No credit for simply listing continents or places where the deserts and rainforests are found. AO3 = 2 marks, AO4 = 1 mark	3

05	3	One mark for the correct answer: **C** High temperatures all year (25–27 °C), rainfall in every month (1800–2000 mm per year). No credit if two or more statements are shaded. AO1 = 1 mark	1

05 4 — 6

Level	Marks	Description
2 (Clear)	4–6	Characteristics are clearly described. Explanation is clear and sequential relating the characteristic(s) in the photograph to the climate of tropical rainforest areas. Adaptation to climate is explicit. There is clear reference to the photograph as

		well as own knowledge. Statements are developed and linked. Knowledge of the features of vegetation and climate is accurate and is used to support the explanation. Knowledge and understanding are applied clearly to interpret geographical information. Good use is made of the photograph. The answer is clear, coherent and focused.
1 (Basic)	1–3	Makes simple statements based either on the photograph or own knowledge. Little development of ideas. May rely on description with no explanation of the features of vegetation and how they are adapted to the climate. Alternatively description is absent or poor and explanation is partial. Begins to relate features observed to climate. Statements separate in a random order. Knowledge of vegetation and climate is limited. Knowledge and understanding are applied in a limited way to interpret geographical information. Little use is made of the photograph.
	0	No relevant content.

<u>Indicative content</u>
Responses should include description and explanation. There should be evidence that the photograph has been used eg the buttress roots of the trees, limited undergrowth, long straight trunks.

Leaves grow at the top of the trees in the canopy area mainly as they need to grow tall to reach sunlight. This competition means that there are some very tall trees above the general height, called emergents, as they compete for sunlight. 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.

Other aspects can be credited eg stratification or layering of different types of vegetation, saprophytes.

Max. Level 1 for either description or explanation.

		AO1 = 2 marks, AO3 = 2 marks, AO4 = 2 marks	

05	5	Central America. No credit for stating more than one region. AO4 = 1 mark	1

05	6	Impacts must be environmental, not economic or social. One mark for stating an impact, with second mark for developing the point. Examples of developed statements: Forest habitats are destroyed (1) leading to reduction and possible decimation of species (1). Soil erosion increases as the tree cover is removed (1), which can cause barren land, flooding and landslides (1). Burning the rainforest releases CO_2 (1), which contributes to world climate change (1). AO2 = 2 marks	2

05	7	The answer must focus on the international implication of sustainable forest management. One mark for stating the reason, with a second mark for a developed explanation. Examples of developed statements: Forests are being destroyed at such a rapid pace in different parts of the world (1) that individual countries can achieve very little on their own (1). Many of the problems caused by deforestation cut across national borders (1). These include climate change and atmospheric pollution (1). AO2 = 2 marks	2

Question 6 Hot Deserts

06	1	**Level**	**Marks**	**Description**	9
		3 (Detailed)	7–9	Detailed awareness of challenges and opportunities in hot arid/semi-arid environments and the relationships between them. Cause and effect are well understood and there is effective use of detailed exemplification. The named case study is used to make points regarding different activities, including scale of development and control over water development. Clear application of knowledge and understanding to the demands of the question. More than one economic activity and challenge should be described. Demonstrates comprehensive and accurate knowledge of locations, places and processes in relation to desert environments. Shows thorough geographical understanding of the inter-relationships between places, environments and processes in the context of hot deserts. Includes good application of knowledge and understanding to interpret and analyse geographical information and issues.	
		2 (Clear)	4–6	Some awareness of challenges and opportunities in hot environments and the relationships between them. Cause and effect are understood and there is use of support. Specific reference is made to a case study which “rings true” for the example selected. Demonstrates clear knowledge of locations, places and processes in relation to desert environments. Shows some geographical understanding of the inter-relationships between places, environments and processes in the context of hot deserts. Includes reasonable application of knowledge and understanding to interpret and analyse geographical information and issues.	
		1 (Basic)	1–3	Limited awareness of challenges and opportunities in hot desert environments and the relationships between them. Cause and effect are not well understood.	

		Simple statements, perhaps list-like at lower end. Information is general with little or no mention of relevant case study. Demonstrates very limited knowledge of locations, places and processes in relation to desert environments. Shows slight geographical understanding of the inter-relationships between places, environments and processes in the context of hot deserts. Includes little or no application of knowledge and understanding to interpret and analyse geographical information and issues.
	0	No relevant content.

<u>Indicative content</u>

Actual content will depend on the case study chosen.

Opportunities include resource exploitation, including agriculture, recreation and tourism. 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.

Case studies may be based in poor or rich parts of the world. In economically advanced countries, South West US may be used. Economic activity may focus on water supply and how it is managed, such as dams along the Colorado, provision for commercial farming, supplying water to California, possible provision of a power source to facilitate development such as tourism; development of tourism on a large scale, such as Las Vegas, building areas for retirement. There are many opportunities for commercial farming for fruit, including vines and wheat in California, usually making use of irrigation water stored behind large dams, such as behind Hoover Dam (Lake Mead). Mining is well developed; the large mineral reserves are accessible due to high levels of technology, and are extracted on a large scale, including uranium in Grants. Copper is the most important mineral mined in the western USA especially in Arizona. Copper smelters are located near Salt Lake City in Utah. Other minerals are zinc, silver and lead with the main areas in Colorado and Idaho. These provide valuable raw materials for industry.

In poorer areas the most likely case study is the Thar desert – economic activities include subsistence farming. The desert area is not very fertile. Soils are quickly drained, and contain few nutrients. Farming is limited, typically a few animals on the more grassy areas, with nomadic pastoralists moving with livestock in search of water and pasture. There are hunter-gatherers killing animals for food and

		collecting wild fruits. Commercial farming has been possible since the building of the Indira Ghandhi Canal. This irrigates an area near Jodhpur. Wheat and cotton can be grown. The canal also supplies drinking water. Resources such as limestone and gypsum (for making plaster) are found in this desert – and are valuable for the building industry. Hydroelectric power is supplied by the Nangal power plant located on the Sutlej River in Punjab. Tourism is a growing industry, and locals can act as guides and provide transport – such as hiring out camels, or organising small-scale safaris, eg in Jaisalmer. AO1 = 3 marks, AO2 = 3 marks, AO3 = 3 marks	

Question 7 Cold environments

07	1	**Level**	**Marks**	**Description**	9
		3 (Detailed)	7–9	Focuses on the specific challenges and opportunities in cold environments and the relationships between them. Cause and effect is well understood and there is effective use of detailed exemplification with clear sense of place. The named case study is used to make points regarding different activities, including scale of development and control over the inhospitable conditions. More than one economic activity and challenge should be described. Demonstrates comprehensive and accurate knowledge of locations, places and processes in relation to cold environments. Shows thorough geographical understanding of the inter-relationships between places, cold environments and processes. Includes good application of knowledge and understanding to interpret and analyse geographical information and issues.	
		2 (Clear)	4–6	Some awareness of challenges and opportunities in cold environments and the relationships between them. Cause and effect is understood and there is some limited use of exemplification. Demonstrates some knowledge of locations, places and processes in relation to cold environments. Shows some geographical understanding of the inter-relationships between places, cold environments and processes. Includes reasonable application of knowledge and understanding to interpret and analyse geographical information and issues.	
		1 (Basic)	1–3	Limited awareness of challenges and opportunities in cold environments and the relationships between them. Cause and effect is not well understood and there is very limited or no exemplification. Demonstrates very limited knowledge of locations, places and processes in relation to cold environments. Shows slight geographical understanding of the inter-relationships between places, cold	

		environments and processes. Includes little or no application of knowledge and understanding to interpret and analyse geographical information and issues.
	0	No relevant content.

Indicative content

For cold environments, credit answers that focus on Arctic or Antarctic regions. Allow reference to tundra as well as polar areas. Answers should relate to economic opportunities and the associated challenges. 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. Case studies are likely to focus on Northern Canada and/or Alaska. Drilling and mining activities occur in the Canadian Arctic and Alaska. In Alaska there has been extensive drilling for oil at Prudhoe Bay. Oil and gas exploration and production taxes account for 88% of the State of Alaska's revenue, providing over $10 billion per year. Alaska also offers some of the highest hydroelectric power potential in the country from its numerous rivers. Large parts of the Alaskan coastline offer wind and geothermal energy potential as well. The state has a large seafood fishing industry, with the primary fisheries in the Bering Sea and the North Pacific.

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.

Candidates may make the link 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 which enable their development.

No credit for management of cold environments.

AO1 = 3 marks, AO2 = 3 marks, AO3 = 3 marks

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