

Unit 1: Changing Landscapes

Mark Scheme

Guidance for Examiners

Positive marking

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, as opposed to adopting an approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

The mark scheme for this unit includes both point-based mark schemes and banded mark schemes.

Point-based mark schemes

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision should be made. Each creditworthy response should be ticked in red ink. Do not use crosses to indicate answers that are incorrect. The targeted assessment objective (AO) is also indicated.

Banded mark schemes

For questions with mark bands the mark scheme is in two parts.

The first part is advice on the indicative content that suggests the range of concepts, processes, scales and environments that may be included in the learner's answers. These can be used to assess the quality of the learner's response.

The second part is an assessment grid advising on bands and the associated marks that should be given in responses that demonstrate the qualities needed in the three AOs, AO1, AO2 and AO3, relevant to this unit. The targeted AO(s) are also indicated, for example AO2.1c.

Assessment Objective	Strands	Elements
AO1 Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change, at a variety of scales.	N/A	This AO is a single element.
AO2 Apply knowledge and understanding in different contexts to interpret, analyse and evaluate geographical information and issues.	N/A	1a - Apply knowledge and understanding in different contexts to analyse geographical information and issues.
		1b - Apply knowledge and understanding in different contexts to interpret geographical information and issues.
		1c - Apply knowledge and understanding in different contexts to evaluate geographical information and issues
AO3 Use a variety of relevant quantitative, qualitative and fieldwork skills to: <ul style="list-style-type: none"> • investigate geographical questions and issues • interpret, analyse and evaluate data and evidence • construct arguments and draw conclusions. 	1 - investigate geographical questions and issues	N/A
	2 - interpret, analyse and evaluate data and evidence	
	3 - construct arguments and draw conclusions	

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied. This is done as a two stage process.

Banded mark schemes Stage 1 – Deciding on the band

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

Banded mark schemes Stage 2 – Deciding on the mark

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

The specialised concepts from the specification that apply in the indicative content are underlined.

The mark scheme reflects the layout of the examination paper. Mark questions 1 and 2 or questions 3 and 4 in Section A, all questions in Section B. If the candidate has responded to all questions in Section A, mark all these responses. Award the higher marks attained; further possible rubric infringements will be discussed at the marking conference.

Be prepared to reward answers that give **valid and creditworthy** responses, especially if these do not fully reflect the 'indicative content' of the mark scheme.

Section A: Changing Landscapes

Either: Coastal Landscapes

1. a Use <i>Figure 1</i> to outline why 'managed retreat' is a positive choice for Cwm Ivy.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award up to 2 marks for the development of any of the following points up to a maximum of 5 marks					5		5
<p>Indicative content</p> <p>Managed retreat (called managed realignment in SMPs) is allowing the shoreline to move naturally, but managing the process to direct it in certain areas. This is usually done in low-lying areas. (Environment Agency definition).</p> <p>Positive ideas / benefits that the 'managed retreat' bring to Cwm Ivy include:</p> <ul style="list-style-type: none"> • creates a new saltmarsh / wetland ecosystem (1 mark) • saltmarsh is a valuable habitat for wildlife (1 mark) • saltmarsh is a sustainable habitat / as it works with nature (1 mark) • provides feeding and resting sites for birds and other wildlife (1 mark) • new habitat will compensate for damage to other areas of natural environment during new protection schemes (1 mark) <p>Development of any of the above points (+1 mark)</p> <p>Credit other valid points.</p>							

1. b Suggest <i>one</i> reason why the sea wall has been breached	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following with 2 marks for further development			3				3
<p>Indicative content</p> <p>The breaching of sea defences is increasing. The reasons or <u>causality</u> include:</p> <ul style="list-style-type: none"> • increasing number of storms (1 mark) increase the number of high energy waves (1 mark) more erosion (1 mark) • increasing severity of storms / high winds driving waves (1 mark) increase the number of high energy waves (1 mark) more erosion (1 mark) • sea level rise (1 mark) more wave erosion through tidal cycle (1 mark) undercuts sea wall (1 mark) • original sea wall was very old (1 mark) • increasing cost of repair (1 mark) may mean this was not well maintained (1 mark) weakens ability to defend against waves (1 mark) • cost-benefit reasons eg Cwm Ivy farmland may not very valuable (1 mark) <p>Credit other valid points.</p>							

1.c Describe and explain how changes in sea level result in the formation of one coastal landform	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total																					
	5	3					8																					
<p>Indicative content</p> <p>Answers could refer to the process of sea level change to establish whether eustatic or isostatic change is the driver and whether the change is positive or negative. The most common landforms to be explained will be: emergent - raised beaches, raised wave-cut platforms and raised cliffs (with associated wave-cut notches, arches, stacks etc); submergent – rias, fiords and Dalmatian coastlines. Accept other valid landforms.</p> <p>Marking guidance</p> <p>Likely AO1 content includes: description of the processes that result in sea level change, description of the formation of the selected landform with possible use of diagram(s).</p> <p>Near the upper end, answers that score highly at AO2.1a (explain how) should give reasons or causes and show an understanding of how process has resulted in the characteristics of the selected landform</p> <p>Near the lower end, answers that score weakly at AO2.1a may be little more than a description of the selected landform</p> <p>Award the marks as follows:</p> <table border="1" data-bbox="124 1115 1469 1977"> <thead> <tr> <th data-bbox="124 1115 842 1149"></th> <th data-bbox="842 1115 1469 1149">AO1 [5 marks]</th> <th data-bbox="842 1115 1469 1149">AO2.1a [3 marks]</th> </tr> </thead> <tbody> <tr> <td data-bbox="124 1149 842 1216"></td> <td data-bbox="842 1149 1469 1216"><i>Demonstrates knowledge and understanding of the formation of one coastal landform</i></td> <td data-bbox="842 1149 1469 1216"><i>Applies (AO2.1a) to explain how changes can result in the formation of one coastal landform</i></td> </tr> <tr> <td data-bbox="124 1216 842 1249">Band</td> <td data-bbox="842 1216 1469 1249"></td> <td data-bbox="842 1216 1469 1249"></td> </tr> <tr> <td data-bbox="124 1249 842 1485">3</td> <td data-bbox="842 1249 1469 1485"> 4-5 marks Mostly accurate knowledge and understanding of the formation of the selected landform Developed example(s) Well-annotated sketches / diagrams may be used </td> <td data-bbox="842 1249 1469 1485"> 3 marks Well-developed description and explanation of the formation of the selected landform that links process and characteristics Contextual example(s) are well applied to the question </td> </tr> <tr> <td data-bbox="124 1485 842 1709">2</td> <td data-bbox="842 1485 1469 1709"> 2-3 marks Partial knowledge and understanding of the formation of the selected landform Generalised knowledge of example(s) Simple sketches / diagrams may be used </td> <td data-bbox="842 1485 1469 1709"> 2 marks Description with partial or unbalanced explanation of the formation of the selected landform that links process and characteristics Contextual example(s) are well applied in part to the question </td> </tr> <tr> <td data-bbox="124 1709 842 1910">1</td> <td data-bbox="842 1709 1469 1910"> 1 mark Limited knowledge and understanding of the formation of the selected landform Limited exemplification Basic sketches / diagrams may be used </td> <td data-bbox="842 1709 1469 1910"> 1 mark Basic description with limited explanation of the formation of the selected landform that links process and characteristics The example does not support the context </td> </tr> <tr> <td data-bbox="124 1910 842 1977">0</td> <td data-bbox="842 1910 1469 1977"> 0 marks Response not creditworthy or not attempted </td> <td data-bbox="842 1910 1469 1977"> 0 marks Response not creditworthy or not attempted </td> </tr> </tbody> </table>									AO1 [5 marks]	AO2.1a [3 marks]		<i>Demonstrates knowledge and understanding of the formation of one coastal landform</i>	<i>Applies (AO2.1a) to explain how changes can result in the formation of one coastal landform</i>	Band			3	4-5 marks Mostly accurate knowledge and understanding of the formation of the selected landform Developed example(s) Well-annotated sketches / diagrams may be used	3 marks Well-developed description and explanation of the formation of the selected landform that links process and characteristics Contextual example(s) are well applied to the question	2	2-3 marks Partial knowledge and understanding of the formation of the selected landform Generalised knowledge of example(s) Simple sketches / diagrams may be used	2 marks Description with partial or unbalanced explanation of the formation of the selected landform that links process and characteristics Contextual example(s) are well applied in part to the question	1	1 mark Limited knowledge and understanding of the formation of the selected landform Limited exemplification Basic sketches / diagrams may be used	1 mark Basic description with limited explanation of the formation of the selected landform that links process and characteristics The example does not support the context	0	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted
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2. a (i) Use <i>Figure 2</i> to calculate the percentage (%) of coastline which is eroding in Wales. Show your workings.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for the process and 1 mark for the correct answer					2		2
Indicative content <ul style="list-style-type: none"> • Correct process (1 mark) • Length of coastline eroding (346) x 100 = 34600 ÷ Length of coastline (1498) • Correct answer (1 mark) – 23.1% (allow 23.0 or 23.09) Credit other valid points.							

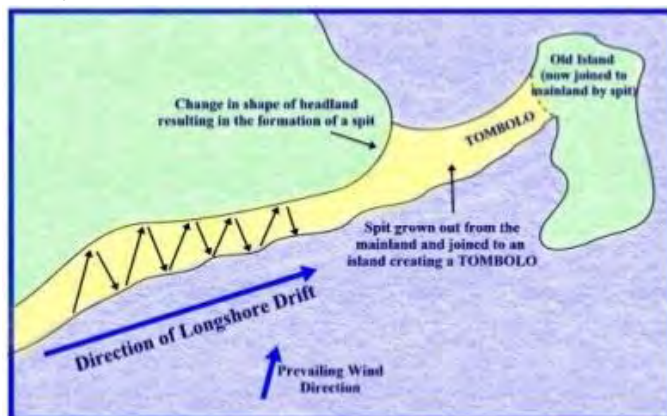
2. a (ii) Use <i>Figure 2</i> to describe the extent of coastline erosion in Wales compared to that in Scotland.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 3 marks					3		3
Indicative content <ul style="list-style-type: none"> • Wales has a bigger percentage (%) which is eroding (1 mark) • More significant as Wales has a smaller coastline than Scotland (1 mark) • Quantification (1 mark) eg Wales 23.1 versus Scotland 11.6 (1 mark) Credit other valid points.							

2. (b) Suggest <i>one</i> lithological factor that causes the rate of coastal erosion to vary.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following with 2 marks for further development			3				3
Indicative content The difference may be due to variations in: <ul style="list-style-type: none"> • Mineral composition (1 mark) some minerals decompose easily (1 mark) increase rate of erosion (1 mark) • Hardness (1 mark) some rocks are more resistant to mechanical erosion (1 mark) erode more easily (1 mark) • Solubility of rocks (1 mark) limestone consists of minerals that are soluble (1 mark) erode faster (1 mark) • Structure (1 mark), the presence/absence/frequency of joints and bedding planes (1 mark), makes some rocks more/less resistant or prone to mechanical and chemical erosion (1 mark). Credit other valid points.							

2. c Describe and explain why deposition plays a role in the development of tombolos.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	5	3					8

Indicative content

Likely AO1 content includes: description of the development of a tombolo, with possible use of diagram(s).



- Material is transported along a coastline and where there is a reduction in energy the sediment is dropped
- If there is a change in direction in the coastline and longshore drift, a spit may begin to form. Where there is an island off shore it may be joined to the mainland by the spit ie a tombolo is formed eg Portland
- Sometimes wave refraction around an island will cause loss of energy which causes deposition to occur

Marking guidance

Near the upper end, answers that score highly in AO2.1a will develop the role deposition plays in the formation of a tombolo (causality). This may be by demonstrating the effects of the process of deposition in forming or developing a tombolo or looking at deposition as one of several processes which contribute to the tombolo's formation. Near the lower end, explanation will be very limited.

Credit other valid approaches.

Award the marks as follows:

AO1 [5 marks]		AO2.1a [3 marks]
	<i>Demonstrates knowledge and understanding of the development of tombolos</i>	<i>Applies (AO2.1a) explaining the role of deposition in the development of tombolos</i>
Band		
3	4-5 marks Mostly accurate knowledge and understanding of the <i>development</i> of tombolos Developed example(s) Well-annotated sketches / diagrams may be used	3 marks Well-developed description and explanation of the role of deposition in the <i>development</i> of tombolos; some structure
2	2-3 marks Partial knowledge and understanding of the <i>development</i> of tombolos Generalised knowledge of example(s) Simple sketches / diagrams may be used	2 marks Description and partial or unbalanced explanation of the role of deposition in the <i>development</i> of tombolos
1	1 mark Limited knowledge and understanding of the <i>development</i> of tombolos Limited exemplification Basic sketches / diagrams may be used	1 mark Basic description with limited explanation of the role of deposition in the <i>development</i> of tombolos
0	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted

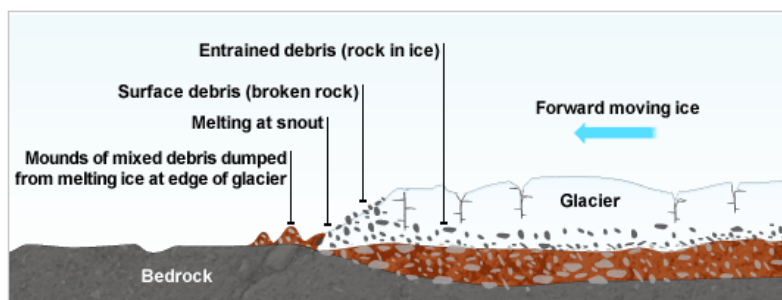
Or: Glacial Landscapes

3. a Use <i>Figure 3</i> to describe changes to the landscape between 1978 and 2011.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 5 marks						5	5
<p>Indicative content</p> <p>This mountainous area of the Andes is showing signs of the effects of climate change as there has been a change from an advancing glacier in 1978 to a retreat in 2011. The question does not ask candidates to explain but to give a description. Change is required and so simple descriptions of the landscape at either date do not fully answer the question.</p> <p>The changes may include:</p> <ul style="list-style-type: none"> • The Qori Kalis glacier has shrunk (1 mark) • The snout of the glacier is further upslope (1 mark) • A lake has appeared in 2011 (1 mark) • More (lateral) moraine / scree is exposed in 2011 (1 mark) on either side of lake / valley (1 mark) • Quantification e.g. the lake is 35 hectares in area (1 mark) 							
3. b Suggest how the changes shown in <i>Figure 3</i> could lead to a glacial lake outburst flood (GLOF).	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 3 marks			3				3
<p>Indicative content</p> <p>The changes indicate that there is a warming of temperatures (<u>causality</u>) which have led to melting of the glacier and the formation of a pro-glacial lake. If this continues, the pressure could cause the dam to break, creating a GLOF or Jokulhaup.</p> <ul style="list-style-type: none"> • The melting of the glacier has created a pro-glacial lake (1 mark) • Continued melting may cause lake to get bigger (1 mark) • The moraine dam may burst (under increased pressure) to cause a GLOF (1 mark) <p>Credit any other valid point.</p>							

3. c Describe and explain why glacial deposition plays a role in the formation of terminal moraines.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	5	3					8

Indicative content

A terminal moraine, also called end moraine, is a moraine that forms at the snout of a glacier, marking its maximum advance, or lowest elevation. Likely AO1 content includes description of how a terminal moraine forms.



As ice melts at the snout of the glacier, rock debris is dumped at the forward edge

creating a terminal moraine (BBC bitesize)

- It resembles a large mound of unsorted material, varying in size from silt sized glacial flour to large boulders

- Terminal moraine forms from freeze-thaw weathering / frost shattering and glacial erosion (plucking and abrasion) removes material from the sides and bed of the glacier
 - This moraine is carried along with the glacier until warmer conditions prevail
 - Ablation at the snout will decrease the glacier's capacity to carry materials and so these are deposited,

Marking guidance

Near the upper end, answers that score well at AO2.1a will focus on the role of deposition in the formation of moraines, explaining the role of glacial deposition in the formation of terminal moraines. This may be shown as a detailed breakdown of how glacial deposition causes (causality) terminal moraines to form. Near the lower end, explanation will be very limited.

Credit other valid approaches.

Award the marks as follows:

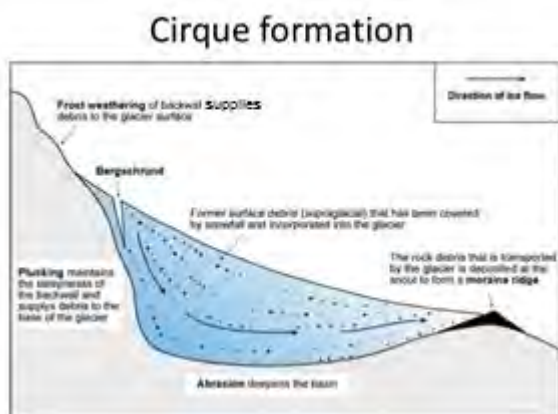
AO1 [5 marks]		AO2.1a [3 marks]
	<i>Demonstrates knowledge and understanding of the formation of moraines</i>	<i>Applies (AO2.1a) explaining the role of deposition in the formation of moraines</i>
Band		
3	4-5 marks Mostly accurate knowledge and understanding of the formation of moraines Developed example(s) Well-annotated sketches / diagrams may be used	3 marks Well-developed description and explanation of the role of deposition in the formation of moraines; some structure
2	2-3 marks Partial knowledge and understanding of the formation of moraines Generalised knowledge of example(s) Simple sketches / diagrams may be used	2 marks Description with partial or unbalanced explanation of the role of deposition in the formation of moraines
1	1 mark Limited knowledge and understanding of the formation of moraines Limited exemplification Basic sketches / diagrams may be used	1 mark Basic description with limited explanation of the role of deposition in the formation of moraines
0	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted

4. a (i) Use the data in <i>Figure 4b</i> to complete the rose diagram for the orientation of cirques in Wales.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 2 marks					2		2
Indicative content Candidates will need to understand the table and work out which piece of data has not been plotted and then accurately plot the figure and complete the diagram. <ul style="list-style-type: none"> Plot 4 cirques for north Join the 'line' to complete the diagram. Credit other valid points.							

4. a (ii) Describe the pattern of orientations shown in <i>Figure 4</i>.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 3 marks					3		3
Indicative content <ul style="list-style-type: none"> North has the highest number of cirques (1 mark) North west also has a high number (1 mark) None in west to south east (1 mark) Quantification (1 mark) Credit other valid points.							

4. b Suggest <i>one</i> reason for the pattern shown in <i>Figure 4</i>.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 3 marks			3				3
Indicative content The distinct pattern suggests a strong reason for this (<u>causality</u>). In the Northern hemisphere more cirques are found facing north because: <ul style="list-style-type: none"> northerly aspects are slightly protected from the sun / less direct insolation (1 mark) snow to lie on the ground for longer and accumulation is highest (1 mark) less insolation also means ablation / melting is lowest (mark) Credit other valid points.							

4.c Describe and explain why freeze-thaw weathering plays a role in the formation of cirques.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	5	3					8

Indicative content

Likely AO1 content includes description of freeze-thaw weathering in the formation of cirques.

- Cirques (cwms or corries) develop in mountainous areas where there is an accumulation of snow in hollows. The snow compacts into ice and this accumulates over many years to compact into névé. The hollow is deepened by nivation (by the combined effects of repeated freezing and thawing and removal of material by melting snow)

- The snow and névé, then grows into a corrie / cirque glacier which moves downhill because of gravity, the mass of the ice, water at its base and the slope it is on

- It will move in a rotational movement because of

the slope and the overlying pressure. The ice freezes to the back wall and as it does plucks rock out steepening the back wall

- Freeze thaw and frost shatter above the hollow on exposed rocks shatters the rock and deliver shattered rock known as scree to the ice
- This material from plucking and frost shatter is then moved along under the ice abrading the hollow by scratching the surface rock. This is further aided under the ice by the fact that pressure melting point is often surpassed allowing melt water to exist at the base and allowing basal sliding to occur
- This creates a steep back wall and a hollow known as a corrie or cirque. In addition, water trickling down the Bergschlund encourages even more freeze thaw action encouraging the corrie to grow further
- At the front edge of the corrie the ice thins out as it speeds up on its journey down the valley, and this area is eroded less and crevasses form. This leaves a lip of rock. When the ice melts a corrie lake can form

Marking guidance

Near the upper end, answers that score well in AO2.1a will focus on an explanation of the role of freeze-thaw weathering in the formation of a cirque. This may be shown as a detailed breakdown of how freeze-thaw weathering provides material for erosion to occur (causality), especially abrasion. Near the lower end, answers will have very limited explanation.

Credit other valid approaches.

Award the marks as follows:

AO1 [5 marks]		AO2.1a [3 marks]
	<i>Demonstrates knowledge and understanding of cirque formation</i>	<i>Applies (AO2.1a) explaining the role of freeze-thaw weathering in cirque formation</i>
Band		
3	4-5 marks Mostly accurate knowledge and understanding of cirque formation. Developed example(s) Well-annotated sketches / diagrams may be used	3 marks Well-developed description and explanation of the role of freeze-thaw weathering in cirque formation; some structure

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2	<p style="text-align: center;">2-3 marks</p> <p>Partial knowledge and understanding of cirque formation.</p> <p>Generalised knowledge of example(s)</p> <p>Simple sketches / diagrams may be used</p>	<p style="text-align: center;">2 marks</p> <p>Description with partial or unbalanced explanation of the role of freeze-thaw weathering in cirque formation</p>
1	<p style="text-align: center;">1 mark</p> <p>Limited knowledge and understanding of cirque formation</p> <p>Limited exemplification</p> <p>Basic sketches / diagrams may be used</p>	<p style="text-align: center;">1 mark</p> <p>Basic description with limited explanation of the role of freeze-thaw weathering in cirque formation</p>
	<p style="text-align: center;">0 marks</p> <p>Response not creditworthy or not attempted</p>	<p style="text-align: center;">0 marks</p> <p>Response not creditworthy or not attempted</p>

Section B: Tectonic Hazards

5. a (i) Use <i>Figure 5</i> to describe the distribution of areas with a high mortality risk associated with earthquakes.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark per point and allow 1 mark for quantification up to a maximum of 5 marks						5	5
Indicative content <ul style="list-style-type: none"> • Highest concentrations in SE Asia (1 mark) • Large area in NE China (1 mark) • Large area in S China (1mark) • Border of India / Pakistan (1 mark) • Large area in Himalayas (1 mark) • Large area in Sumatra / Java (1 mark) • Large area in Andes / Central America (1 mark) • Anomalies in East Africa or California (1 mark) • Quantification (1 mark) Credit other valid points.							

5. a (ii) Suggest <i>three</i> human factors that may explain why the areas shown in <i>Figure 5</i> have a high mortality risk.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
			9				9
Indicative content The question is asking candidates to put forward and develop plausible and informed ideas based on wider knowledge and understanding to suggest why areas have a high mortality risk. The focus is on human factors. There are a number of factors that could be used to explain why mortality is high: economic development, levels of technology available, population characteristics (age/gender/education), quality of governance to co-ordinate preparation or response, quality of urban or rural housing, medical facilities and infrastructure. Answers may mix factors in explanation – in particular economic development may be used to outline the operation of other factors.							
Marking guidance Near the upper end, answers that interpret (AO2.1b) will suggest why areas have a high mortality risk and should develop the link to why these factors cause high mortality; for example, areas of high mortality have less effective medical facilities, which means that victims are not treated for injuries incurred during the earthquake. The population is also vulnerable to the effects of disease after the earthquake as medicine and treatment are not available. Near the lower end, there will be very little interpretation.							
Credit other valid approaches.							
Award the marks as follows							
Band	Marks						
3	7-9 marks	Suggests factors in a structured way. Contextual examples are well-applied.					
2	4-6 marks	Partial and / or unstructured suggestions of factors applied in part to the question.					
1	1-3 marks	Limited suggestions of factors. The examples do not support the context.					
	0 marks	Response not creditworthy or not attempted.					

5. b) Outline how the following characteristics affect the level of impact of a tectonic hazard.		AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total															
Magnitude Speed of onset		8						8															
<p>Indicative content The question is asking for a summary of the influence of magnitude and speed of onset on the level of impact of earthquakes and volcanoes. This may come in the form of the hazard in general or part of the chosen hazard ie volcanoes or pyroclastic flows. When outlining magnitude there may be comment on the strength / energy involved in the event and how this may influence the level of damage or how strength may influence the character of the hazard – tsunami height, amount of ash produced etc. The speed of onset may refer to preparation times, evacuation opportunities etc. There could be comment on sudden eruptions and those that give lots of warning.</p> <p>Marking guidance Answers that score highly for AO1 will outline the above and may recognise scales when magnitude is discussed (Richter, Mercali, VEI) but this is not required for full credit. These characteristics should be linked to the level of impact in the form of mortality, injury, migration etc. and both need to be addressed. At the lower end, there will be a limited outline, with simplistic points. Credit other valid points.</p> <p>Award the marks as follows</p> <table border="1"> <thead> <tr> <th>Band</th> <th>Marks</th> <th></th> </tr> </thead> <tbody> <tr> <td>3</td> <td>6-8 marks</td> <td>Outlines characteristics in a structured way. Contextual examples are well-applied. Spelling, punctuation and grammar used with a high degree of accuracy.</td> </tr> <tr> <td>2</td> <td>4-5 marks</td> <td>Partial and / or unstructured outline of characteristics. Contextual examples are applied in part to the question. Or outlines one characteristic in a structured way with contextual examples. Spelling, punctuation and grammar used with a reasonable degree of accuracy.</td> </tr> <tr> <td>1</td> <td>1-3 marks</td> <td>Limited outline of characteristics. The examples do not support the context. Spelling, punctuation and grammar used with limited accuracy.</td> </tr> <tr> <td></td> <td>0 marks</td> <td>Response not creditworthy or not attempted.</td> </tr> </tbody> </table>									Band	Marks		3	6-8 marks	Outlines characteristics in a structured way. Contextual examples are well-applied. Spelling, punctuation and grammar used with a high degree of accuracy.	2	4-5 marks	Partial and / or unstructured outline of characteristics. Contextual examples are applied in part to the question. Or outlines one characteristic in a structured way with contextual examples. Spelling, punctuation and grammar used with a reasonable degree of accuracy.	1	1-3 marks	Limited outline of characteristics. The examples do not support the context. Spelling, punctuation and grammar used with limited accuracy.		0 marks	Response not creditworthy or not attempted.
Band	Marks																						
3	6-8 marks	Outlines characteristics in a structured way. Contextual examples are well-applied. Spelling, punctuation and grammar used with a high degree of accuracy.																					
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1	1-3 marks	Limited outline of characteristics. The examples do not support the context. Spelling, punctuation and grammar used with limited accuracy.																					
	0 marks	Response not creditworthy or not attempted.																					

6. a Use <i>Figure 6</i> to describe changes in the source of household income before and after the 2010 Haiti earthquake.		AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
							5	5
<p>Indicative content</p> <ul style="list-style-type: none"> • Most sources of income have reduced • Only zero income has increased • Remittances stay the same • Largest drop is street vendors • Smallest drop is handicrafts • Quantification <p>Credit other valid points.</p>								

6. b Explain how earthquakes produce tsunamis.			AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
			5						5
Indicative content									
Tsunami is a huge wave caused by either volcanic or earthquake activity on the sea floor under the ocean from sudden movement of tectonic plates. The activity on the sea floor from shock waves radiating from the epicentre displaces the sea bed which creates a wave deep in the ocean, moving towards land. When the wave reaches shallower water the wave height increases and waves get closer. When these hit land they cause huge flooding eg Indian Ocean 2004 and Japan 2011.									
Marking guidance									
Near the upper end, answers that score well for AO1 will give an accurate and developed account of the link between earthquakes and tsunamis. There will be clear factual detail in the explanation of process. Near the lower end, answers that score weakly may be limited in their explanation of process. Credit other valid points.									
Award the marks as follows:									
Band	Marks								
3	4-5	Developed ideas of how earthquakes produce tsunamis.							
2	2-3	Partial and/or unstructured ideas of how earthquakes produce tsunamis.							
1	1	Limited ideas of how earthquakes produce tsunamis.							
	0	Response not creditworthy or not attempted.							

6. c. Suggest the short-term responses that could be used to mitigate the consequences of changes shown in Figure 6.			AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
					10				10
Indicative content									
The question is looking for suggestions, that is, interpretation of short-term responses which occur in the weeks and months after the earthquake. The resource shows that sources of income may have decreased after the earthquake and so families will require support for food, shelter, medical help and employment. Responses may come in the form of food, shelter, first aid and medical provisions, and aid from national and international agencies. Answers may refer to the nature of the responses and give detail on how the responses function to <u>mitigate</u> the effects of the earthquake.									
Marking guidance									
Near the upper end, those that score highly on interpretation (AO2.1b) will suggest short-term responses will involve reference to the essential elements of mitigation which can be seen as structural, for example infrastructure, provision of shelter and non-structural, for example provision of funds, social and community services. Measures should be given context as required in the question so responses could be directed at different income sources. Credit other valid points.									
Award the marks as follows:									
Band	Marks								
3	7-10 marks	Suggests short term responses in a structured way. Mostly accurate link to mitigation of effects. Spelling, punctuation and grammar used with a high degree of accuracy.							
2	4-6 marks	Partial and / or unstructured suggestions of short term responses. Partial or unbalanced link to mitigation of effects. Spelling, punctuation and grammar used with a reasonable degree of accuracy.							
1	1-3 marks	Limited suggestions of short term responses. Limited link to mitigation of effects. Spelling, punctuation and grammar used with limited accuracy.							
	0 marks	Response not creditworthy or not attempted.							

7. a (i) Use <i>Figure 7</i> to describe trends in global volcanism.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following up to a maximum of 5 marks						5	5
Indicative content <ul style="list-style-type: none"> • Overall increase • Rate of increase changes over time • Fluctuating • Level of fluctuation increases 1970-2008 • Lowest 1841 • Highest 2006/7 • Quantification <p>Credit other valid points.</p>							

7. a (ii) Outline <i>two</i> reasons why these trends may not be accurate.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following with further mark for development						4	4
Indicative content <ul style="list-style-type: none"> • Distant parts of world becoming accessible(1 mark) events are now known (1 mark) • Increased technology such as satellites (1 mark) allows eruptions to be monitored (1 mark) • Increased reporting of events (1 mark) allows more recording (1 mark) • Better monitoring (1 mark) allows more events to be recorded at lower VEIs (1 mark) <p>Credit other valid points.</p>							

7 (b) Use <i>Figure 7b</i> to suggest how people living in the homes shown would be affected by the ash cloud	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following or a combination of points up to maximum of 3			3				3
Indicative content <p>Looking for comments which clearly demonstrate the application of knowledge and understanding through the interpretation of the photograph in the context shown.</p> <ul style="list-style-type: none"> • Ash would cover the land. As a result, crops may be affected and yields fall. • The ash would get into the homes shown as they are poorly constructed. This would make living conditions more difficult. • Ash cloud may affect the quality of the air. This may particularly affect any babies and the elderly living in the homes. • The quality of the housing suggests a poor community. Therefore may not be able to pay for the additional food needed when the crops are affected or for access to healthcare as a result of any respiratory problems from the event. • Ash could get into the water supply that the homes rely on. This could lead to sickness. <p>Credit other valid points.</p>							

7. c Describe the demographic and economic impacts of the eruption of one volcano.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10						10

Indicative content

Answers should identify the distinctive features, and give factual detail about the demographic and economic impacts of one volcano. This can be a description of one eruption or review the impacts of a number of eruptions of the same volcano.

The content of answers will vary considerably with the selection of volcanic and / or earthquake event(s) and the examples used to illustrate the response. Expect a variety of generic ideas to form the basis of responses – some may look at long- and short-term impacts whilst some may see impacts as local, regional or global.

Reference may be made to a number of impacts:

- level of mortality
- migration / displacement
- disease / injury
- costs of housing damage
- costs of damage to infrastructure – water, gas, electricity
- costs caused by disruption of transport and communication
- costs of disruption and destruction of industry – agriculture, manufacturing, service
- costs of recovery

Marking guidance

Near the upper end, answers that score well will give an accurate and developed account of impacts for both elements. Near the lower end, answers that score weakly may be limited in their description of impacts.

Credit other valid points.

Band	Marks	
3	6-8 marks	Describes the demographic and economic impacts in a structured way. Contextual examples are well-applied. Spelling, punctuation and grammar used with a high degree of accuracy.
2	4-5 marks	Partial and / or unstructured description of the demographic and economic impacts. Contextual examples are applied in part to the question. Spelling, punctuation and grammar used with a reasonable degree of accuracy.
1	1-3 marks	Limited description of the demographic and economic impacts. The examples do not support the context Spelling, punctuation and grammar used with limited accuracy.
	0 marks	Response not creditworthy or not attempted.