



GCE AS MARKING SCHEME

SUMMER 2025

**AS
GEOGRAPHY - UNIT 1
2110U10-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

GCE AS GEOGRAPHY
UNIT 1: CHANGING LANDSCAPES
SUMMER 2025 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 component 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 to indicate creditworthy material. Annotations supplied on DRS must be used for any items of 6 marks or over to reflect the mark awarded for the question. The targeted assessment objective (AO) is also indicated within this mark scheme.

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. This is followed by 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 component. The targeted AO(s) are also indicated, for example AO2.1c. 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.

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: - 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 Stage 1 – Deciding on the band

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), the qualities of each mark band will be discussed in detail. 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 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 mark scheme reflects the layout of the examination paper. Mark questions 1 and 2 or 3 and 4 in Section A and 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: Coastal or Glacial Landscapes

Either: Coastal Landscapes

1. (a) (i) Use Figure 1 to compare the beach profiles in Year 1 and Year 2.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
Award 1 mark per correct point.					5		5
Responses must directly compare the beach profiles. Separate descriptions of the two profiles cannot be given credit. Indicative content - In Year 1 the beach was generally higher (1) Credit any accurate supporting data e.g. at 20m from the back of the beach it is 2.5m whereas in year 2 it is 0.6m (1) - In Year 1 the beach is much flatter (1) from 7 to 40m from the back (1) OR in year 2 there is a steeper gradient (1) between 0 and 20m. (1) - There is a step/berm (at 75m) which is not present in Year 2 (1) - The biggest difference in beach height occurs at 25m from the back of the beach (1) - It reaches 0m elevation at 105m from back of beach in Year 1 whereas in Year 2 the beach reaches 0m elevation at only 60m from back of beach (1) - In Year 2 the profile is more uneven (1) Credit any other valid comparisons. Award max. 2 marks for quantification.							

1. (a) (ii) Suggest one reason for the changing beach profile in Figure 1 .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
			3				3
Answers should suggest a reason for the lowering and the general flattening of the beach between Year 1 and Year 2. 1 mark can be awarded for suggesting a valid reason and up to 2 marks for development points. The element of change in the beach profile must be addressed for the full 3 marks. Only one reason must be given credit. Indicative content - Variation in weather / season (1) calm weather builds up a beach (1) stormier weather erodes a beach (1) - Variation in wave type (1) constructive waves build up a beach / make it higher (1) destructive waves erode the beach / make it lower / flatter (1) - Variation in wind / wave direction (1) causing a difference in fetch (1) and wave energy (1) - Possibility of removal of sediment by humans / offshore dredging (1) causing sediment supply to the beach to decrease (1) sea has more energy to erode the beach (1) - Addition of groyne or sea defences (1) leading to the beach being starved of sediment (1) leading to lowering of beach (1) Accept any other valid responses. Do not credit longshore drift as a reason for the changing beach profile unless it is linked to the addition of groynes/sea defences.							

1. (b) Examine the role of biotic processes in the formation of one coastal landform.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	5			3			8

Indicative content

AO1

AO1 content encompasses knowledge and understanding of biotic processes and the formation of a coastal landform. Content will depend on the landform chosen but may include:

Coral reefs

- Coral polyps secrete calcium carbonate and build reefs
- Need primary producers such as plankton to eat
- Climate change has a negative impact on coral reefs
- Other factors including high salinity and water depth and clarity have a significant influence on their formation (water of no more than 100m depth and it must be clear water to allow light to penetrate). The optimal sea temperature for the formation of coral reefs is 23-29°C.

Mangroves

- Mangrove trees develop specialized roots, such as aerial tap roots, which help stabilize the soil, anchor the tree and provide oxygen in waterlogged conditions. These roots also have a unique ability to limit the absorption of salt.
- Mangrove seeds, known as propagules, are dispersed by water. They float and travel to new locations where they can take root and grow.
- Various animals, including crabs and fish, interact with mangroves. Crabs help aerate the soil, while fish use the roots for shelter and breeding grounds.
- Dead plant material and organic matter are broken down by decomposers like bacteria and fungi, enriching the soil and supporting new growth.
- Other factors include temperature. Mangroves thrive in warm climates. The regions within 30 degrees of the equator provide the consistent warm temperatures necessary for their growth.

Sand dunes / Salt marshes

- Colonisers e.g. marram grasses stabilise embryo dunes and cordgrass stabilises salt marshes as roots trap more sediment
- Organic matter is added to the sand / silt by plants and animals over time, creating a more diverse ecosystem and improving conditions for invaders to establish
- More sediment is trapped by increased biodiversity, and dune / marsh accretes over time
- Human activity has a negative impact on dunes and salt marshes
- Other factors include wind direction and sediment supply to the area.

Arches, stumps, stacks and cliffs

- **Biological Weathering:** Organisms like algae, lichens, and burrowing animals contribute to the weakening of coastal rock through chemical and physical weathering, making it more susceptible to erosion and the formation of features like caves, which can evolve into arches.
- **Vegetation Influence:** Coastal vegetation, such as grasses and shrubs, can stabilize some areas while leaving others exposed. This uneven protection can influence erosion patterns, indirectly shaping the development of arches, stacks, and stumps.
- **Bioerosion by Marine Organisms:** Marine organisms such as molluscs, sponges, and certain types of bacteria bore into rock surfaces, accelerating erosion and contributing to the breakdown of arches into stacks and eventually stumps.

AO2

AO2 content includes an examination of the role of biotic processes in the formation of the landform. At the lower end candidates may simply comment that “biotic processes are important”. In band 3 responses will develop the examination. Content may include:

- Comment on the importance of biotic processes compared to other factors or processes such as coastal or fluvial processes, aeolian processes (dunes), weather and climate and human factors.
- Comment on the importance of biotic processes over different timescales.
- Comment on the importance of biotic processes in different locations.

Credit any other valid points.

Award the marks as follows:		
	AO1 (5 marks)	AO2.1c (3 marks)
Band	<i>Demonstrates knowledge and understanding of biotic processes in the formation of one coastal landform.</i>	<i>Applies knowledge and understanding to examine the role of biotic processes in the formation of one coastal landform.</i>
3	4-5 marks Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples. Demonstrates detailed and accurate knowledge and understanding of biotic processes. Demonstrates detailed and accurate knowledge and understanding of the links between biotic processes and the landform identified. Well annotated sketches / diagrams / maps may also be used and should be credited.	3 marks Applies knowledge and understanding to produce a thorough and coherent examination that is supported by evidence. Applies knowledge and understanding to produce a thorough and coherent examination of the role of biotic processes in the formation of one landform.
2	2-3 marks Demonstrates partial knowledge and understanding through the use of appropriate examples that are not fully developed. Demonstrates partial knowledge and understanding of biotic processes. Demonstrates partial knowledge and understanding of the links between biotic processes and the landform identified. Sketches / diagrams / maps may also be used and should be credited.	2 marks Applies knowledge and understanding to produce a coherent but partial examination that is supported by some evidence. Applies knowledge and understanding to produce a coherent but partial examination of the role of biotic processes in the formation of one landform.
1	1 mark Demonstrates limited knowledge and understanding through a limited number of undeveloped examples. Demonstrates limited knowledge and understanding of biotic processes. Demonstrates limited knowledge and understanding of the links between biotic processes and the landform identified. Basic sketches / diagrams / maps may be used and can be credited.	1 mark Applies knowledge and understanding to produce an examination with limited coherence and support from little or no evidence. Applies knowledge and understanding to produce a limited examination of the role of biotic processes in the formation of one landform.
	0 marks Response not creditworthy or not attempted.	0 marks Response not creditworthy or not attempted.

2. (a) (i) Use Figure 2 to analyse the pattern shown.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					5		5
Indicative content • Majority of waves during a year come from the South-west - 50% • It is double the next most frequent direction (W) / 25% difference • 25% of waves come from the West • There are no waves coming from the North or East OR from NW to SSE • Less than 10% of waves come from WNW, S or SSW • More come from the W and WNW (34%) than the S / SSW (16%) • Nearly all come from a westerly direction. Credit any other valid points relating to pattern.							

Band	AO3 (5 marks)
3	4-5 marks Accurate analysis using data from the full range of directions and using more than one technique e.g. calculating differences and totals to interpret/analyse the pattern seen.
2	2-3 marks Partial analysis that begins to recognise pattern. May be descriptive and list-like, drift into explanation or contain some inaccuracies.
1	1 mark Lifts information with no analysis or reference to pattern.
	0 marks Response not creditworthy or not attempted.

2. (a) (ii) Suggest one reason for the pattern shown in Figure 2 .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
			3				3
1 mark can be awarded for suggesting a valid reason and up to 2 marks for development points. Only one reason must be given credit. Indicative content • Prevailing winds (1) from the Atlantic (1) South-westerly in the UK (1) wind creates / drives waves towards shore (1) • Wave refraction (1) and reflection (1) around headlands (1) can control wave direction (1) • There may be land to the east (1) acts a shelter (1) from wind and waves from the East (1) • Long / longest fetch (1) across Atlantic (1) creates the most dominant / largest waves (1) Credit any other valid points.							

2. (b) Assess the success of one strategy used to manage the impacts of human activity on coastal processes and landforms.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	5			3			8
Indicative content AO1 AO1 content encompasses knowledge and understanding of one management strategy and how it manages the impact of human activity on coastal areas. Responses will vary according to the strategy chosen but may include: • Fencing off areas along coastal paths / dunes / marshes to prevent footpath erosion. • Designations such as National Park / AONB / NNR / SSSI to control new developments. • Transport and parking strategies e.g. park and ride. • Education of visitors through signage / wardens etc. For Band 3 description of strategy must be explicitly linked to impact on coastal processes and landforms AO2 AO2 content encompasses an assessment of the impact of the management strategy in managing human activity. At the lower end candidates may simply comment that “the strategy is successful”. At the higher end arguments will be developed. Content may include: • Comment on the successes of the strategy • Comment on the shortcomings of the strategy • Comment on the strategy in terms of economic, social, environmental impact • Comment on the impact of the strategy over time or varying success of the strategy in different places. Credit any other valid points.							

Award the marks as follows:		
	AO1 (5 marks)	AO2.1c (3 marks)
Band	<i>Demonstrates knowledge and understanding of one management strategy used to manage the impact of human activity on the coastal environment.</i>	<i>Applies knowledge and understanding to assess the success of one management strategy.</i>
3	4-5 marks Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples. Demonstrates detailed and accurate knowledge and understanding of one management strategy and its impact on human activity. Well annotated sketches / diagrams / maps may also be used and should be credited.	3 marks Applies knowledge and understanding to produce a thorough and coherent assessment that is supported by evidence. Applies knowledge and understanding to produce a thorough and coherent assessment of the success of the chosen management strategy.
2	2-3 marks Demonstrates partial knowledge and understanding through the use of appropriate examples that are not fully developed. Demonstrates partial knowledge and understanding of one management strategy. Sketches / diagrams / maps may also be used and should be credited.	2 marks Applies knowledge and understanding to produce a coherent but partial assessment that is supported by some evidence. Applies knowledge and understanding to produce a coherent but partial assessment of the success of the chosen management strategy.
1	1 mark Demonstrates limited knowledge and understanding undeveloped examples. Demonstrates limited understanding of a management strategy. Sketches / diagrams / maps may be used and can be credited.	1 mark Applies knowledge and understanding to produce an assessment with limited coherence and little or no support from evidence. Applies knowledge and understanding to produce a limited assessment of the success of the chosen management strategy.
	0 marks Response not creditworthy or not attempted.	0 marks Response not creditworthy or not attempted.

Or: Glaciated Landscapes

3. (a) (i) Use Figure 3 to compare ice thickness in Year 1 and Year 4.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
Award 1 mark per correct point.					5		5
Responses must address the changes in ice thickness. Separate descriptions of the two profiles cannot be given credit. Indicative content - Ice was generally thicker in year 4 (1) Credit any accurate supporting data e.g. at 800m up-valley elevation / altitude was 395m in Year 1 and 460m in year 4 (1) - The difference in ice thickness increases with distance up-valley (1) - There is a more rapid increase in thickness at 475m in year 1 compared to year 4 (1) increases by 40m across 40m distance (1) - Biggest difference in thickness occurs c.750m up-valley (1) - There is a slight increase (followed by a decrease) in thickness of the ice at 730m up-valley in both years (1) - In year 1 ice is thicker down valley / at around 600m-850m, in year 4 it is thickest in the middle / at around 750m-900m (1) Credit any other valid points. Award max. 2 marks for quantification.							

3. (a) (ii) Suggest one reason for the changing ice thickness shown in Figure 3 .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
			3				3
1 mark can be awarded for suggesting a valid reason and up to 2 marks for development points. Only one reason must be given credit. Indicative content - Increased snowfall in Year 4 / across the years following year 1 (1) increases accumulation/less ablation (1) mass balance increases (1) - Colder temperatures in year 4 / years following year 1 (1) decreases ablation (1) mass balance increases (1) - El Nino events cause short term changes in climate conditions (1) OR cause cooling in NZ (1) leading to less ablation (1) mass balance increases (1) Credit any other valid points.							

3. (b) Examine the role of different processes in the formation of one fluvioglacial landform.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	5			3			8
Indicative content AO1 AO1 content includes knowledge and understanding of different processes of fluvioglacial transport and deposition leading to the formation of fluvioglacial landforms. Fluvioglacial landforms can be split into two groups; ice contact features and proglacial features. Content will vary according to the chosen landform but may include knowledge and understanding of: Ice contact features • Sub-glacial streams and the formation of eskers. Material is transported by high-energy meltwater streams. This is then deposited in subglacial tunnels when meltwater decreases / when glaciers retreat creating long winding ridges of sorted material on the valley floor. • Meltwater transports material into crevasses or depressions in the glacier. When the ice melts, this material is deposited to form kames. Kames are conical, flat-topped hills of stratified material. • Similarly, meltwater streams can flow along the sides of a glacier, transporting material. When the flow is reduced, this material is deposited to form kame terraces. Proglacial features • Sandurs also known as outwash plains are formed in front of a glacier when meltwater carries material out from the glacier over a wide area. The finest sediments are carried further away from the glacier, while coarser materials are deposited nearer to the snout of the glacier. • Meltwater streams deposit sediment which buries chunks of ice as glacier retreats. Ice melts to create small, rounded hollows, which fill with water to form kettle holes or kettle lakes. • Varves are successive layers of fine sediments deposited by meltwater streams into glacial lakes. During the summer months when discharge is higher, more sediments flow into the lake and deposits accumulate more rapidly. Coarse material in particular, such as sand and silt, flows into the lake during the summer melt and is deposited on the lake bed. During the winter where there is little or no discharge in meltwater streams, finer material and organic matter within the lake will sink to the bottom. AO2 AO2 content encompasses an examination of the role of different processes in the formation of a fluvioglacial landform. At the lower end candidates may state simply that “transportation processes are important” while arguments will be developed in band 3. Content may include: • Comment on the relative importance of different processes e.g. transportation and deposition • Comment on the importance of different processes across different seasons e.g. in winter there is less meltwater while meltwater is at its maximum during spring • Comment on the importance of other processes that may impact the chosen landform e.g. sediment supply, climate change / glacier retreat • Comment on the importance of different processes in different locations. Credit any other valid points but only credit fluvioglacial landforms.							

Award the marks as follows:

	AO1 (5 marks)	AO2.1c (3 marks)
Band	<i>Demonstrates knowledge and understanding of different processes and the formation of one fluvio-glacial landform.</i>	<i>Applies knowledge and understanding to examine the role of different processes in the formation of one fluvio-glacial landform.</i>
3	4-5 marks Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples. Demonstrates detailed and accurate knowledge and understanding of the processes involved in the formation of a fluvio-glacial landform. Demonstrates detailed and accurate knowledge and understanding of the links between different processes and the formation of one fluvio-glacial landform. Well annotated sketches / diagrams / maps may also be used and should be credited.	3 marks Applies knowledge and understanding to produce a thorough and coherent examination that is supported by evidence. Applies knowledge and understanding to produce a thorough and coherent examination of the role of different processes in the formation of one fluvio-glacial landform.
2	2-3 marks Demonstrates partial knowledge and understanding through the use of appropriate examples that are not fully developed. Demonstrates partial knowledge and understanding of the processes involved in the formation of a fluvio-glacial landform. Demonstrates partial knowledge and understanding of the links between different processes and the formation of one fluvio-glacial landform. Sketches / diagrams / maps may also be used and should be credited.	2 marks Applies knowledge and understanding to produce a partial examination that is supported by some evidence. Applies knowledge and understanding to produce a partial examination of the role of different processes in the formation of one fluvio-glacial landform.
1	1 mark Demonstrates limited knowledge and understanding through a limited number of undeveloped examples. Demonstrates limited knowledge and understanding of the processes involved in the formation of a fluvio-glacial landform. Demonstrates limited knowledge and understanding of the links between different processes and the formation of one fluvio-glacial landform. Basic sketches / diagrams / maps may be used and can be credited.	1 mark Applies knowledge and understanding to produce an examination with limited coherence and little or no support from evidence. Applies knowledge and understanding to produce a limited examination of the role of different processes in the formation of one fluvio-glacial landform.
	0 marks Response not creditworthy or not attempted.	0 marks Response not creditworthy or not attempted.

4. (a) (i) Use Figure 4 to analyse the pattern of cirque orientation.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					5		5
Indicative content • Majority of cirques face NE - 12 or 1/3 or 33% • This is double the next highest orientation - NNE • Around 60% of cirques face between NNE and ENE (or between N and E) • There are no cirques facing S, E or SW to NW • There are slightly more cirques facing between S and E compared to between N and W 10 and 3 respectively Accept any other valid comments relating to pattern.							

Band	AO3 (5 marks)
3	4-5 marks Accurate analysis using data from the full range of directions and using more than one technique e.g. calculating differences and totals to interpret/analyse the pattern seen.
2	2-3 marks Partial analysis that begins to recognise pattern. May be descriptive and list-like, drift into explanation or contain some inaccuracies.
1	1 mark Lifts information with no analysis or reference to pattern.
	0 marks Response not creditworthy or not attempted.

4. (a) (ii) Suggest one reason for the pattern shown in Figure 4 .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
			3				3
1 mark for suggesting a reason and up to 2 marks for development points. Only one reason must be given credit. Indicative content • Temperature/Aspect (1) North facing slopes are shaded / less sunlight (1) snow and ice accumulates more than South facing slopes (1) • Wind direction (1) blows / deposits more snow (1) on north faces (1) more snow associated with some wind directions than others (1)							

4. (b) Assess the success of one strategy used to manage either ; the impact of human activity on glacial processes and landforms. or the impacts of glacial processes and landforms on human activity.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	5			3			8

Indicative content

AO1

AO1 content encompasses knowledge and understanding of one management strategy. Responses will vary according to the strategy chosen but may include:

Managing impact of human activity on glacial processes

- Fencing off areas along important landforms / eroded paths to prevent footpath erosion.
- Designations such as National Park / AONB / NNR / SSSI to control new developments.
- Transport and parking strategies e.g. park and ride.
- Education of visitors through signage / wardens etc
- Managing climate change

For band 3, descriptions of strategy must be linked to impact on glacial processes / landforms.

Managing impacts of glacial processes on human activity

- Generic approaches include hazard mapping and land use planning.
- Monitoring areas at risk of avalanche / warnings / controlled avalanches / safety procedures for skiers.
- Rockfalls / debris slides – evacuation plans, monitoring of slopes (visual and geodetic), and precipitation, small scale structural measures to protect villages downslope
- Glacial Lake Outburst Floods – controlled breaching or outlet control structures, warning systems
- Subsidence in periglacial areas – engineering solutions to protect infrastructure, relocations / adjustments.

For band 3, descriptions of strategy must be linked to impact on human activity.

AO2

AO2 content encompasses an assessment of the success of the management strategy in managing impacts. At the lower end candidates may simply comment that “the strategy is successful” but at the higher end this will be developed. Content may include:

- Comment on the successes and shortcomings of the strategy.
- Comment on the strategy in terms of economic, social, environmental impact.
- Comment on the impact of the strategy over time or in different places.

Credit any other valid points.

Award the marks as follows:		
	AO1 (5 marks)	AO2.1c (3marks)
Band	<i>Demonstrates knowledge and understanding of one management strategy to manage impacts of human activity on glacial processes or the impacts of glacial processes on human activity.</i>	<i>Applies knowledge and understanding to assess the success of the management strategy.</i>
3	4-5 marks Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples. Demonstrates detailed and accurate knowledge and understanding of one management strategy to manage human activity and its impacts on glaciated processes and landforms or the impact of glacial processes and landforms on human activity. Well annotated sketches / diagrams / maps may also be used and should be credited.	3 marks Applies knowledge and understanding to produce a thorough and coherent assessment that is supported by evidence. Applies knowledge and understanding to produce a thorough assessment of the success of the management strategy.
2	2-3 marks Demonstrates partial knowledge and understanding through the use of appropriate examples that are not fully developed. Demonstrates partial knowledge and understanding of one management strategy to manage human activity and its impacts on glaciated processes and landforms or the impact of glacial processes and landforms on human activity. Sketches / diagrams / maps may also be used and should be credited.	2 marks Applies knowledge and understanding to produce a coherent but partial assessment that is supported by some evidence. Applies knowledge and understanding to produce a partial assessment of the success of the management strategy.
1	1 mark Demonstrates limited knowledge and understanding through a limited number of undeveloped examples. Demonstrates limited understanding of a management strategy and / or the impacts of human activity on glacial processes or the impact of glacial processes on human activity. Describes a strategy with no link to human activity or glacial processes. Sketches / diagrams / maps may be used and can be credited.	1 mark Applies knowledge and understanding to produce an assessment with limited coherence and little or no support from evidence. Applies knowledge and understanding to produce a limited assessment of the success of the management strategy.
	0 marks Response not creditworthy or not attempted.	0 marks Response not creditworthy or not attempted.

Section B: Tectonic Hazards

5. (i) Use Figure 5a to describe the relationship between earthquake magnitude and number of earthquakes.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
Award 1 mark per correct point.					2		2
Indicative Content - The stronger the magnitude the lower the frequency or vice versa (1) or negative correlation (1) - Vast majority of earthquakes were the lowest magnitude of 4.0 to 4.9 (1) - Very few earthquakes were magnitude 7.0 or above, (1) - There were no earthquakes above magnitude 8 in 2022 (1) - Credit any correct calculation to support the description e.g. there are over 8 times as many earthquakes of magnitude 4.9 compared to magnitude 5.9 (1) Lifting data with no comment on the relationship cannot be credited. Accept any other valid points.							

5. (ii) Describe one data presentation method suitable for presenting the data on number of earthquakes in Figure 5a .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					2		2
Award one mark for suggesting suitable technique: - Bar graph (1) - Stacked bar graph (1) - Pie chart (1) - Accept scattergraph (1) Award the second mark for an accurate description: - Used to show discrete data/non-continuous (1) - Bar graph y axis shows number of eq. x axis shows magnitude (1) - Stacked bar graph shows total number of eq. divided to show % of different magnitudes (1) - Pie chart uses segments of a circle to represent % of eq. of different magnitudes (1) - A scattergraph will display data on number of earthquakes and show any relationship to magnitude (1) Accept any other valid responses.							

5. (iii) Use Figure 5b to calculate the percentage of total global deaths due to the Afghanistan earthquake. Show your working. Give your answer to one decimal place.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					3		3
1107/1288 (1) x 100 (1) = 85.9 (1) This is the only correct answer. No mark here if decimal place not used correctly. Inclusion of unit (%) is not necessary to achieve full marks.							

6. (a) Use Figure 6a to describe the pattern of earthquake intensity across east Afghanistan.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					5		5
Indicative content Answers must comment on pattern. Lifts of intensity data needs to be linked to a pattern. • Reference to concentric pattern of decreasing magnitude with distance from epicentre (1) • Magnitude decreases more rapidly nearer the epicentre and more slowly further away (1) Decreases from 5.5 to 5 across 10km (1) but decreases from 4 to 3.5 across 40 km (1) • Highest intensity is 5.5 on the border with Pakistan or South-west Khost province or North-east of Paktika province (1) • Higher intensities extended further from the epicentre towards Matun or North-east of the epicentre (1) • Intensity of 4.5 and above limited to Khost province and Paktika province (1) • Lower intensities (less than 4) felt in Paktya or west of Paktika or towards the North (1) • Cities of Sharan and Ghazni felt intensity of around 3.5 (1) Matun felt intensity of around 4 (1) Accept any other valid comments related to pattern of intensity. Do not credit multiple data lifts relating to a single pattern (see bullet 3). 3 marks would not be awarded for listing separate places as part of the same pattern.							

6. (b) Use Figures 6b and 6c to examine reasons why people in rural areas may be at higher risk during earthquakes in Afghanistan.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
				9			9
Indicative content Candidates must use the resources and apply knowledge of the factors that affect vulnerability in order to examine the extent of the variation of risk between rural and urban areas. Judgements will vary but credit should be given for justifications given. Content may include: • Comment on the variation in earthquake resistance of different building types and construction materials and the increased risk due to the likelihood of building collapse and deaths / injuries. Lasting trauma and other longer-term impacts of loss of homes likely to be worse in rural areas as a result (Figure 6b) • Comment on the population size in rural areas compared to urban areas and the impact on the success of any potential response and rescue effort. 76.5% of the population live in rural areas therefore far more difficult to help everyone (Figure 6b) • Comment on ease of access / availability of resources between rural and urban areas and how this may affect recovery / death rates. For example, heavy rescue equipment and helicopters, communications – it will take a long time even to find out what has happened to people in remote locations (Figure 6c) • Physical factors such as relief and climate make responses more difficult and time consuming (Figure 6c) • Candidates may offer an examination of which factor is the most important or significant in terms of affecting level of risk. Credit any other valid answers. Candidates are not expected to cover all points above for full marks.							

	AO2.1c (9 marks)
Band	<i>Applies knowledge and understanding to examine reasons why people in rural areas may be at higher risk during earthquakes.</i>
3	7-9 marks Applies knowledge and understanding to produce a thorough and structured examination of factors affecting level of risk during earthquakes in rural areas. Well-developed and balanced arguments, supported by appropriate evidence from the resources.
2	4-6 marks Applies knowledge and understanding to produce a partial examination of factors affecting level of risk during earthquakes in rural areas. Partially developed and partially balanced arguments, supported by some appropriate evidence from the resources.
1	1-3 marks Applies knowledge and understanding to produce a limited examination of factors affecting level of risk during earthquakes in rural areas. Limited or no support from evidence from the resources.
	0 marks Response not creditworthy or not attempted.

6. (c) Use Figure 6d and Figure 6e to analyse the success of the recovery effort.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
					7		7
The question is asking for an analysis of the resources. These focus on different categories of responses to the earthquake and % of people in need that were helped over time. Candidate responses may give a description of the data and an analysis of the variation between categories in terms of the extent to which needs were met. Indicative Content - Only 40% of funding required for recovery from the earthquake was received by end of June, meaning not all of the responses could be put in place immediately. - Though the most funding / 57% of total funding was required for emergency shelter, by September 2022 nearly all of the people needing shelter had received it (96%), a successful response. 100% of people had received water treatment kits by September 2022. This was the most successful response overall. - However, water treatment kits are required if there is no safe supply of drinking water so there must have been no reliable supply for months after the earthquake. This is not a great success. - Least successful was providing medical assistance to prevent disease – only 28% of people affected received it after 3 months. - Getting food supplies to people was not very successful either with only 34% of people helped. - Helping children was relatively successful, 77% of malnourished children were helped by September 2022. - In the first month water treatment and food supplies were distributed most successfully but only reached 19% of people in that time. - Helping malnourished children was least successful in the first month to July 2022.							

	AO3 (7 marks)
Band	<i>Applies geographical skills to analyse the success of the recovery effort.</i>
3	6-7 marks Uses skills to produce a thorough and coherent analysis that is supported by evidence.
2	3-5 marks Uses skills to produce a coherent but partial analysis that is supported by some evidence.
1	1-2 mark Uses skills to produce an analysis with limited coherence and support from limited evidence. This band may be categorised by simple data lifts from the resources.
	0 marks Response not creditworthy or not attempted

6. (d) Use Figures 6a to 6e to examine the relative importance of the physical and human factors which affected the response to this earthquake.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
				10			10
Answers may take a variety of approaches but should focus on factors that make rescue and recovery challenging. Indicative content Candidates should apply knowledge and understanding to examine the influence of both physical and human factors which affected the response to the earthquake: Physical factors - Figure 6a shows the nearest city of Matun is approximately 50km from the epicentre (location / isolation). Proximity to the epicentre leads to higher earthquake intensity and higher levels of damage impacting the size of the response required - The earthquake affected a relatively large area with very strong to moderate shaking impacting an area within a 50km radius of the epicentre - Figure 6b shows that 76.5% of people are in rural locations which may leads to difficulty finding people or accessing remote areas - Figure 6c explains that access to supply machinery to rural areas, to clear rubble, is impossible. Other hazards more likely on steep slopes (avalanche and rockfalls) which also block routes and endanger rescue workers (relief) - Figure 6c explains that weather conditions can pose challenges, meaning resources such as helicopters could not be deployed immediately. This makes it difficult to find out who was affected and how badly / where they were, as well as to provide any assistance. Human factors - Figure 6b shows a high rural population and poor housing quality leads to greater damage and slow recovery - Figure 6c explains that there are poor transport links to rural areas further impacting the recovery effort - Figure 6d shows there was insufficient money to fund recovery and also suggests that the progress of the recovery effort was slow. If the country had more money or aid provided, they may have overcome the physical challenges e.g. provided more helicopters, more trained staff - Likely lack of planning and preparation over such a wide area e.g. lack of specialist equipment. Figure 6e shows slow responses to many of the needs to the people affected. For band 3, expect a judgement which addresses the question and suggests whether physical or human factors were the main barrier to effective responses. Max 4. if only physical or human factors addressed. It is not expected that candidates cover all points for full marks. Credit other valid points.							

	AO2.1c (10 marks)
Band	<i>Applies knowledge and understanding to examine the relative importance of physical and human factors affecting the response to the earthquake.</i>
3	7-10 marks Applies knowledge and understanding to produce a thorough and structured examination of the relative importance of physical and human factors affecting the response to the earthquake. Well-developed and balanced arguments, supported by appropriate evidence.
2	4-6 marks Applies knowledge and understanding to produce a partial examination of the relative importance of physical and human factors affecting the response to the earthquake. Partially developed and partially balanced arguments, supported by some appropriate evidence.
1	1-3 marks Applies knowledge and understanding to produce a limited examination of the relative importance of physical and human factors affecting the response to the earthquake. Limited or no support from evidence.
	0 marks Response not creditworthy or not attempted

7. (a) Outline how quality of governance may influence vulnerability to tectonic hazards.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	8						8
Indicative content Expect a wide variety of answers that may discuss national or local scale governance. Explanations may include: • Degree of provision of basic needs/resilience • Monitoring and prediction/warnings of a tectonic event • Preparedness / disaster management agencies • Education • Land use planning • Corruption/degree of accountability to public e.g. enforcement of building codes • Economics – money available to fund disaster management.							

	AO1 (8 marks)
Band	<i>Demonstrates knowledge and understanding of political factors that influence vulnerability.</i>
3	6-8 marks Demonstrates accurate knowledge and understanding of political factors that influence vulnerability to tectonic hazards. Demonstrates knowledge and understanding using well developed and appropriate examples.
2	3-5 marks Demonstrates partial knowledge and understanding of political factors that influence vulnerability to tectonic hazards. Demonstrates knowledge and understanding using mostly appropriate examples with some development.
1	1-2 mark Demonstrates limited knowledge and understanding of political factors that influence vulnerability to tectonic hazards. Demonstrates limited knowledge and understanding using examples which are undeveloped.
	0 marks Response not creditworthy or not attempted.

7. (b) Explain why the characteristics of Earth's mantle result in plate movement.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	5	3					8

Indicative content

AO1	AO2
Thickest layer is the mantle, between the core and crust (2900km thick) composed of mostly solid / viscous silica rich rock.	
Less viscous at plate boundaries and mantle plumes. At plate margins pressure is lowered so that the mantle melts and erupts at constructive boundaries.	Resulting ridge causes gravitational sliding that drives plate movement (ridge push) .
Temperature gradient ranging from 3700°C (at core) to 1000°C (beneath crust). Temperature gradient means that convection currents occur. Hotter material is less dense and rises towards the crust. Cooler material sinks towards the core.	These currents convection currents help drive plate movement .
Pressure gradient – pressure increases towards the core so that the rocks are solid despite the higher temperatures. Asthenosphere (upper mantle) is less viscous due to lower pressure.	Cooler and denser subducted material at destructive plate margins sinks and pulls plates along (slab pull) .

AO1

AO1 content encompasses knowledge and understanding of the characteristics of the mantle.

AO2

AO2 content includes the explanation of the plate movement **linked** to the characteristics of the mantle.

NB: as these theories are still under debate we can accept all of these ideas as valid, though many argue that slab pull is the strongest driver of plate movement.

Credit any other valid points.

Award the marks as follows:

Band	AO1 (5 marks)	AO2.1a (3 marks)
3	4-5 marks Demonstrates accurate knowledge and understanding of a range of the characteristics of the mantle.	3 marks Applies knowledge and understanding to accurately link plate movement to the characteristics of the mantle.
2	2-3 marks Demonstrates partial knowledge and understanding of the characteristics of the mantle.	2 marks Applies knowledge and understanding to partially link plate movement to the characteristics of the mantle.
1	1 mark Demonstrates limited / inaccurate knowledge and understanding of the characteristics of the mantle.	1 mark Applies some knowledge and understanding to make a basic link between plate movement and the characteristics of the mantle.
	0 marks Response not creditworthy or not attempted.	0 marks Response not creditworthy or not attempted.

7. (c) Describe two social impacts of a named volcanic eruption.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3		Total
	10						10
Indicative content Responses will vary according to the case study chosen. Expect references to: • Death rates / injuries (linked to social impacts) • Homelessness / damage to homes and communities • Disruption to education • Psychological trauma • Increase in numbers of vulnerable people e.g. orphaned children • Health issues from ash. Credit any other valid points. Do not credit more than two social impacts and do not credit impacts that are explicitly economic or environmental. Responses that do not identify a named event cannot get in to Band 3. Responses that take a full case study approach (with multiple impacts) with no attempt to clearly answer the questions are limited to Band 1. Where a candidate bases their response on an earthquake event, where valid credit up to 2 marks.							

Award the marks as follows:		
Band	Marks	AO1 (10 marks)
3	7-10	Demonstrates accurate knowledge and understanding of two social impacts of a named volcanic eruption. Demonstrates accurate knowledge and understanding through the use of a well-developed and appropriate example. Well annotated diagrams and sketch maps may be used and should be credited.
2	4-6	Demonstrates partial knowledge and understanding of two social impacts of a named volcanic eruption. Demonstrates partial knowledge and understanding through the use of a mostly appropriate example which may not be fully developed. Generalised diagrams and sketch maps may be used and should be credited.
1	1-3	Demonstrates limited knowledge and understanding of two social impacts of a named volcanic eruption. Demonstrates limited knowledge and understanding using examples which are undeveloped. Basic diagrams and sketch maps may be seen and can be credited.
	0	Response not creditworthy or not attempted.