

Mark Scheme (Results)

Summer 2026

Pearson Edexcel Advanced Subsidiary in Geography
8GE0/01

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.

Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response

Paper 1 Mark scheme (Pre-standardisation)

Question number	Identify the first stage of the hazard management cycle after the hazard event. Answer	Mark
1(a)	AO1 (1 mark) Award 1 mark for the correctly identified stage of the hazard response cycle. D–Response ☐ A, B and C are all from the hazard management cycle but are not the first stage.	(1)

Question number	Calculate the percentage of emissions that threatened Canlaon City. Answer	Mark
1(b)(i)	AO3 (2 marks) Award 1 mark for each correctly calculated stage: - Add them all up = 36 / Calculate $5 \div 36 = 13.88\%$ - The answer, rounded to 1 decimal place is 13.9 ☐	(2)

Question number	Suggest one way that this eruption of Mount Kanlaon might affect the people living around the volcano. Answer	Mark
1(b)(ii)	A01 (2 marks)/A02 (1 mark) Award 1 mark for analysing the resource to suggest a reason for having concern, and a further 2 marks for justifying the possible reason, for example: • Sulphur dioxide will be released / most of the gases are being blown South □ travelling long distances / towards where people may live / people may not have been evacuated / which are then inhaled by local people □ who might become ill / suffer from respiratory issues / suffocated by the volcanic gases / be forced to evacuate □. • People suffering from health issues □ might put strain on the health infrastructure □ limiting access to other medical services □. • Ash can disrupt air travel □ as flights are cancelled / diverted □ with associated economic consequences / inability to evacuate / loss of profit for airlines □. • Gas eruptions can be invisible □ which increases vulnerability for local communities □ if they do not evacuate / suffer from the associated health effects □. • Ashfall can make the land more fertile □ as nutrients are slowly released into the soil □ as it chemically breaks down / improving the soils ability to retain moisture / enhancing the agricultural economy in the area □. • Contamination of water supplies □ can cause unhealthy water / cholera □ resulting higher death toll / homelessness / impact on health services / more work for engineering teams □. • Ash / tephra can add a heavy layer □ causing buildings to collapse / machinery to be clogged □ causing disruption to daily life / work for emergency planning teams / engineers □. • It might lead to further eruptions / pyroclastic flows / lava flows □ which can destroy homes / force people to relocate □ and lose their livelihoods □. Some might argue that people living in Canlaon City might not be affected very much, or that their escape routes might be blocked. Accept any other appropriate response based on Figure 2.	(3)

Question number	Explain two reasons for the movement of tectonic plates. Answer	Mark
1(c)	A01 (4 marks) For each reason, award 1 mark for explaining a process that occurs at plate margins and a further 1 mark for developing that explanation, for example: • Convection currents in the asthenosphere / caused by heat transferred from the earth's core / created by radioactive decay ☐ cause molten magma to rise / move horizontally / drag or move the overlying plates with them ☐. • Slab pull / Subduction / denser plates drag the cooler / less dense / typically oceanic part of the plate into the asthenosphere ☐ partly due to gravity / causing it to melt into the magma at destructive / convergent plate boundaries / in the Benioff zone ☐. • Ridge push is a downwards force that helps push plates apart / operates at constructive plate boundaries ☐ as new magma wells up / hardens to form new rock that becomes thick / dense / heavy ☐. • Friction causes pressure to build up at conservative plate boundaries / as plates move past each other ☐ and when it suddenly releases causes plates to snap past each other ☐. • Sea-floor spreading helps create new oceanic crust at divergent / constructive plate boundaries ☐ as melted, mobile material rises from the asthenosphere to the surface / ridge push causing new material to move away from the plate boundary ☐. Accept any other appropriate response.	(4)

Question number	Explain the physical process that cause tsunamis. Answer
1(d)	AO1 (6 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: • Tsunami waves are caused by the displacement of large quantities (columns) of water. • Earthquakes displace water when movement causes the seabed to thrust upwards. Undersea landslides displace water when material falls from a continental shelf onto the seabed. • Volcanic eruptions displace water when material ejected from the volcano falls into the sea. • Landslides displace water when large quantities of water are displaced by land falling into the sea. • The displaced water becomes tsunami waves and as the waves reach shallower water in coastal areas (as the topography of the seabed changes) the waves become higher. • In shallower water the friction between the tsunami wave and the seabed increases and the tsunami wave slows down, decreasing wavelength but increasing wave height. Accept any other appropriate response.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Understanding addresses a narrow range of geographical ideas, which lack detail. (AO1)
Level 2	3–4	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Understanding addresses a range of geographical ideas, which are not fully detailed and/or developed. (AO1)
Level 3	5–6	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Understanding addresses a broad range of geographical ideas, which are detailed and fully developed. (AO1)

Question number	Assess the extent to which governance reduced the impacts of the 2024 earthquake. Answer
1(e)	A01 (3 marks)/A02 (9 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only A01 without any A02 should be awarded marks as follows: • Level 1 A01 performance: 1 mark • Level 2 A01 performance: 2 marks • Level 3 A01 performance: 3 marks. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: A01 • Strategies to modify the event include land-use zoning, hazard-resistant design and engineering defences. • Strategies to modify vulnerability and resilience include hi-tech monitoring, prediction, education, community preparedness and adaptation. • Strategies to modify loss including emergency, short- and longer-term aid and insurance as well as the actions of affected communities themselves. A02 Better governance has reduced the impact • The number of deaths is drastically lower than in 1999 – and consistently so, suggesting the 1999 earthquake was a seminal disaster that changed earthquake preparation. However, the magnitude was also slightly lower in 2024 / earthquake depth was lower / medical science has improved, so maybe there are other reasons for the death toll being lower. • Modify the event: There is much stricter adherence to building regulations in 2024 – and this is likely due to better governance. On the other hand, the same points as above apply. • Modify the vulnerability: There is better deployment of monitoring systems around the island – although some people have still died, suggesting local factors still play a role. • Earthquake drills are now law (in school and the workplace), which will be the result of government action. On the other hand, the number of significant earthquakes will also mean that the population is well used to reacting to earthquakes, as well as dealing with the potential threat of invasion from China. • Modify the loss: surveillance cameras are being used to plan responses to disasters which represents a good investment by the government. On the other hand, the same points as above apply. Other factors have reduced the impact • Modify the event: the earthquake in 2024 was slightly weaker, and was also a deeper earthquake, so energy is attenuated by the time it

Question number	Assess the extent to which governance reduced the impacts of the 2024 earthquake. Answer
	reaches the surface. On the other hand – the population / population density is much higher – which likely could have counteracted this, but it doesn't seem to... so maybe government actions have played a role. • Modify vulnerability: Ready access to technology makes it possible for 2-8 second warnings which, together with earthquake drills, means the population can react to earthquakes. On the other hand, the earthquakes were still strong enough to result in some loss of life, suggesting more local-factors are still important and could suggest a role for governance. • Modify the loss: the spread of social media means that disaster response teams have access to far better information. This reflects individual and TNC decision-making, however the use of social media shows good governance. Judgements will be based around whether governance has improved in Taiwan after the 1999 earthquake. Most will probably note that a variety of strategies have been used to prepare for earthquakes, but that magnitude of earthquakes still result in some buildings collapsing and people being injured. That said, many are likely to conclude that the statement is generally true. Higher marks are likely to be awarded to candidates who structure their reasoning around different elements of adaptation and mitigation.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgments about the significance of few factors, leading to an argument is unbalanced or lacks coherence. (AO2)
Level 2	5–8	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)

		• Applies knowledge and understanding of geographical information/ideas to make judgments about the significance of some factors, to produce an argument that may be unbalanced or partially coherent. (AO2)
Level 3	9–12	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to make supported judgments about the significance of factors throughout the response, leading to a balanced and coherent argument. (AO2)

Question number	Identify the relict glaciated landform marked X on the photograph. Answer	Mark
2 (a) (i)	AO1 (1 mark) Award 1 mark for a correct identification of the landform: • Corrie ☐ • Cirque ☐ • Debris slope / scree slope ☐ Do not accept • Lake / corrie lake / tarn • Roche Mountanee • Truncated spur • Steep back wall • U-shaped valley • Lodgement till Allow any other reasonable response.	(1)

Question number	Calculate the annual range of temperature. Show your working. Answer	Mark
2 (a) (ii)	A03 (2 marks) Allow up to 2 marks for correctly calculating the range of the data, with working out if required. Identification of max and minimum temperatures from the graph ☐ • Maximum: 10.6°C (accept 10.4 and 10.5°C) • Minimum: 2.0°C Result ☐ • 8.7°C • Accept between: - o $10.6 - 2 = 8.6^{\circ}\text{C}$ - o $10.4 - 2 = 8.4^{\circ}\text{C}$ Allow 1 mark for error on reading values from the graph carried forward into the final calculation. Do not require the identification of both maximum and minimum. If the correct final answer is present, there is no requirement for working out.	(2)

Question number	Suggest one physical process that has helped formed this relict glacial landscape. Answer	Mark
2(a)(iii)	A01 (2 marks)/A02 (1 mark) Award 1 mark for suggesting a reason that is connected to a feature of the landscape shown in figure 2 with a further 2 extension marks to explain why this has resulted in the landscape: • Abrasion / plucking / quarried / excavated the rock at the back / bottom □ ice would have frozen to the back of a hollow / wall / because a cirque glacier would have been in a nivation hollow / the basin of the hollow / rocks or subglacial debris at the bottom of a glacier □ causing it to deepen and steepen / create an armchair shaped hollow today □. • Precipitation / Fog / Water / Snow will have accumulated in a hollows / crack / crevice / fault in the exposed rock □ and when frozen then expanded / caused freeze-thaw weathering □ which would have weakened the rock over time / caused the rock face on the backwall to break down and steepen □. • A cirque glacier has melted □ and while the meltwater has flowed away □ rain / snow / fog each season accumulates in the hollow forming a beautiful cirque lake □. • Snow / meltwater will have accumulated in a hollow on a rockface □ which will have caused frost weathering to enlarged the crack / hollow □enlargingitenough to hold a small / cirque glacier □. Accept any other appropriate response. Note that responses about this relict that can either be rooted in speculation about when it was an active landscape in the past or current (probably rock breakdown) processes.	(3)

Question number	Explain two pieces of evidence that can show the extent of the Pleistocene ice sheet. Answer	Mark
2 (b)	A01 (4 marks) For each reason, award 1 mark for identifying a way that evidence is formed and a further mark expansion explaining how this evidence reflects the extent of the ice sheet, up to a maximum 2 marks each. For example: • The location and position of terminal moraine / medial moraine / erratics from mountain ranges / presence of drumlins mark the furthest point / sides of ice cover ☐ because they are deposited in a glacier's ablation zone / or are consequence of debris being pushed / transported by the glacier / moulded by glaciers ☐. • Corries and aretes also show the highest altitude of ice extent / presence of U-shaped valleys / striations on rock or valley sides ☐ because this is where cirque glaciers / valley glaciers eroded mountain sides / river valleys ☐. • Kames / kame terraces are found where water had flowed at the sides of the glacier ☐ because frictional contact with the valley sides melted the glacier / kame terraces are made of debris sorted by glacial meltwater ☐. • Kettle / Kame and kettle landscapes form just beyond the end of glaciers ☐ because of ice calving burying glacial outwash ☐. • Analysing rock type over a landscape ☐ because meltwater channels can contain material that has been transported over large distances ☐. • Varves might be useful because annual layers of sediment ☐ reflect the amount of meltwater / silt and sandy layers result from high meltwater ☐☐. Accept any other reasonable response, including eskers, drumlins, and ground moraines and other outwash plain features such as sandurs. Don't accept answers that refer to evidence of the Little Ice Age (e.g. photographs etc) – the question is focussed on the Pleistocene ice sheet. Accept any other reasonable response.	(4)

Question number	Explain how meltwater forms fluvioglacial landforms. Answer
2(c)	AO1 (6 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: Glaciers produces a lot of meltwater which flows swiftly on, within, or at the base of the glacier over the bedrock floor – however this flow is subject to the pressure created by the glacier (e.g. it can flow uphill!) Kames and eskers are produced at the margins (underneath, sides and furthest extent) of ice – both ultimately consisting of irregular mounds of sands and gravels have been deposited unevenly. Meltwater from ice may creates large outwash plains (sandur), characterised by multi-thread channels (braids) – but these features require lots of coarse debris, previously eroded by the glacier. Glacial meltwater plays a significant role streamlining, and sorting material that has been deposited – including shaping moraines. Some candidates might write about proglacial landforms. For example: • Sandurs / sandars – a large outwash plain with many channels of water and glacial debris. It might be caused by a catastrophic flood event, and certainly is likely to show marked variation in water discharge • Proglacial lakes – when the meltwater is blocked by (terminal) moraine • Meltwater channels are created by water flowing from the glacier or ice sheet – either into ice, the valley floor or any other moraine deposited either by the glacier. • Kettleholes form when blocks of dead ice, left behind as a glacier retreats, cause the deposition of sediment being carried by meltwater. The sediment buries the ice, which subsequently melts, leaving a depression in the landscape. Lakes can fill these depressions. Allow other reasonable explanations.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Understanding addresses a narrow range of geographical ideas, which lack detail. (AO1)
Level 2	3–4	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Understanding addresses a range of geographical ideas, which are not fully detailed and/or developed. (AO1)

Level 3	5–6	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Understanding addresses a broad range of geographical ideas, which are detailed and fully developed. (AO1)
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Question number	Assess the extent to the successful management of glacial landscapes is made more difficult by climate change. Answer
2(d)	AO1 (3 marks)/AO2 (9 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only AO1 without any AO2 should be awarded marks as follows: • Level 1 AO1 performance: 1 mark • Level 2 AO1 performance: 2 marks • Level 3 AO1 performance: 3 marks. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: AO1 • Global warming / climate change can impact glacial mass balance, which can disrupt the hydrological cycle, e.g. meltwater, river discharge and water quality. • Mass balance is the relationship between accumulation and ablation in a glacial system. In this system, there is also positive and negative feedback. • Glaciated landscapes face varying degrees of threat from natural hazards – e.g. avalanches and glacial outburst floods. • They also face threats from human activities, e.g. leisure and tourism, reservoir construction and urbanisation. • Management approaches range from protection through to sustainable management and multiple economic use. Legislative frameworks are also used, e.g. Antarctic Treaty / Alpine Convention / Kyoto Protocol) • Successful management is increasingly challenging, with a need for coordinated approaches at a global, national and local scale. Different stakeholders (conservations, local and regional government, global organisation, NOG) are involved. AO2 Climate change makes management increasingly difficult: • It introduces multiple, and interacting threats, which required a co-ordinated approach that might suffer from lack of agreed decision making, or funding. There might be disagreement on the causes of change (e.g. court case in Switzerland). On the other hand, the urgency might stimulate stakeholders to act more decisively (e.g. diversification of economic activity in French ski resorts).

Question number	Assess the extent to the successful management of glacial landscapes is made more difficult by climate change. Answer
	- Avalanches are more likely after heavy accumulation of snow, e.g. Chamonix 1999, where 2m had fallen in a week. This becomes a hazard because of the dense accumulation of chalets in the valley floor. <i>Upland threats</i> like avalanches are more likely when there isn't enough sun (ablation) for snow to stabilise quickly – this might be on northerly and westerly slopes (in the Northern Hemisphere). This is manageable because of seasonal and short-term weather prediction. On the other hand, in area of steep slopes (generally above 22°) the momentum of an avalanche might be accelerated if they are channelled into a gully. <i>Lowland threats</i> like glacial lake outburst floods are increasingly a risk as climate forcing results in negative mass balance (i.e. melting). Mass movement, or lake filling / glacial runoff can lead to the flood with little warning. On the other hand, the rapid onset can also be because of the degradation of a moraine- or ice- dam. - Glaciers are likely to recede because of anthropogenic-forced climate warming, and this will result in an increase of water behind unstable moraine dams at high altitudes (e.g. sugar-snap peas in Peru). It can also encourage new types of agriculture – however, this boom in agriculture could be short-lived, as when glaciers have melted, the water supply will dry up (e.g. the Cordillera Blanca) Management will become more difficult for other reasons: <i>Upland threats:</i> there are two types of avalanches. In dry-snow avalanches, the damage is caused by a shock wave and wind gusts within the avalanche. However, in a wet-snow avalanche it is sheer weight of snow (and associated debris) that causes the devastation, e.g. Italian Alps 1885. - The impact of <i>lowland threats</i> like glacial lake outburst floods vary significantly around the world, e.g. 393 people have died in the European Alps vs. several thousand in 70 years in Cordillera Blanca alone. It also depends on how close the population live to a glacial lake and the quality of governance – for example, the level of risk is much higher in the Himalayan Mountain Range. On the other hand, the level of risk is lowest in Greenland because of the low population, because the latitude means accumulation significantly exceeds ablation; people cannot live in those environments. <i>Accessing</i> mountainous regions can be difficult and therefore Providing support and rescue to communities affected by these hazards can be complicated. On the other hand, climate warming will change the nature of accumulation and ablation, reducing the likelihood that snow will block access routes. - Commercial development in mountainous areas is growing – and the type of project is increasingly expensive and catastrophic. Although the loss of livestock is devastating for a community, the cost of a HEP plan would be over \$500million and the loss of power could affect a community (or even a country) for many years. There are other hazards to manage in glacial environments:

Question number	Assess the extent to the successful management of glacial landscapes is made more difficult by climate change. Answer
	- The expansion of agriculture and development of HEP and growth of tourism means that the level of risk in glacial environments has grown significantly, e.g. Uttarakhand, India in 2021. - Volcanoes and earthquakes also create hazards in glacial environments. The complexity of their impact (and management) will vary from country to country, particularly as human activities extend further into high mountainous regions. On the other hand, this is only possible because of melting of glaciers making these regions more accessible. Judgements should be based around whether the impact of climate change on accumulation / ablation processes in glacial environments create hazards which are manageable. Some candidates might note that in these landscapes there are many other factors that influence the level of risk in these environments, and indeed the removal of glaciers leads to some of these changes too. Most are likely to judge that climate change will cause problems with glacial meltwater that is exacerbated by the rising use of risky glacial environments.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	- Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) - Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2) - Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgments about the significance of few factors, leading to an argument is unbalanced or lacks coherence. (AO2)
Level 2	5–8	- Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) - Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2) - Applies knowledge and understanding of geographical information/ideas to make judgments about the significance of some factors, to produce an argument that may be unbalanced or partially coherent. (AO2)

Level 3	9–12	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to make supported judgments about the significance of factors throughout the response, leading to a balanced and coherent argument. (AO2)
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Question number	Complete the bar graph. Answer	Mark
3(a)(i)	A03 (1mark) Award 1 mark for the correctly drawn bar ☐. Distance from the left edge of the path (cm) The top of the bar should reach 32%	(1)

Question number	Identify which sample point had the highest amount of bare ground. Answer	Mark
3(a)(ii)	A03 (1 mark) Award 1 mark for the correctly identified sample point. B – 60cm ☐ A, C D would be an incorrect reading of the axis	(1)

Question number	Identify the sampling strategy the students used to measure trampling across the path. Answer	Mark
3(a)(iii)	A03 (1 mark) Award 1 mark for the correctly identified sampling strategy. D – Systematic ☐ A, B and C are not correct, because the measurements were taken every 20 metres.	(1)

Question number	Suggest one other primary data collection method (fieldwork) the students could use to develop this investigation. Answer	Mark
3(a)(iv)	A03 (2 marks) For each type of fieldwork, award 1 mark for identifying a method, and a further 1 mark for justification of why it extends the investigation: • Field sketching / photos ☐ might help show the extent / causes of the trampling / failure of management strategies / compare the impact of walkers at different places ☐ • Biodiversity survey / quadrat sampling ☐ to analyse the impact walkers are having on the ecosystem / if some plant species are more resilient than others ☐. • Measuring the infiltration rate at different parts of the path ☐ to see how compacted the ground is ☐. • Interviews with walkers / local landowners / footfall counts ☐ might help understand why / when the trampling is at its worst / how they feel about the impact on the footpath / how many people use the footpath ☐. • Complete a litter survey ☐ to see if there is a correlation between litter and footpath damage ☐. Accept any other reasonable response. Methods may refer to secondary data for comparison but must include a primary data collection method	(2)

Question number	Explain two ways students could have used secondary data to plan this fieldwork. Answer	Mark
3(a)(v)	A03 (4 marks) Award 1 mark for explaining a way ICT can be used for this fieldwork scenario and a further expansion of up to a maximum of 2 marks each. • Use a weather app / map / forecast to check on the weather conditions ☐ to ensure it was safe to travel / decide what clothing to wear in an exposed environment ☐. • Use an OS map / GIS map / SatNav to plan their journey ☐ so they can park close to the location / check they can access the location safely / legally) / how long it will take to travel between locations / plan a sampling strategy ☐. • Use fieldwork data collected over previous years about the footpath / GIS or layered map with background data / footfall data ☐ to judge whether the problem has got better or worse / identify hotspot locations where the problem is likely to be bigger ☐. • Look at previous student projects ☐ to plan to revisit the same locations as a comparison / learn from their evaluations ☐.	

	• Looked at old photographs / satellite photos of the area online □ to see whether the footpaths had been damaged in the past / establish if there are specific sites where footpaths have been damaged □ . • Look for articles / news stories / social media / published management plans about the area □ to establish the background of the management strategies / when it was implemented / why it was implemented / how long it has been damaged / establish a hypothesis for what they expected to find □. Accept any other appropriate response. NB – The command word 'Explain' in this context requires reference to the fieldwork scenario.	(4)
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Question number	Assess the validity of the conclusions to your fieldwork investigation. Answer
3(b)	AO3 (9 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Indicative content guidance <i>Please remember that the descriptor provides guidance as to the appropriate level. Bullet points covering the indicative content do not translate directly into marks.</i> Content depends on students' choice of research question, but might include • Fieldwork techniques • Sampling Strategies Links between fieldwork techniques and the resulting geographical enquiry question should be clear • Accuracy and reliability will be affected by sampling and frequency of the fieldwork methods. Accuracy includes having appropriate methods of sampling or data collection which will reduce error and be close to the true value. • Inaccurate data might have led to a wrong conclusion. Equally, inaccurate data collected about a factor that is not relevant to the geographical enquiry question might also reduce the reliability of the conclusions. • Reliability refers to the likelihood that repeated pieces of data collection would yield the same result. This might be because of sampling strategies (systematic / random / stratified) or the timing of the measurements (e.g. are measurements being made in summer vs. winter when the number of tourists might naturally expect to be different). Locational considerations, especially precise details of sites, or transects and sampling locations will impact on the accuracy and reliability of the conclusions. • Consideration of recording sheets (methods), adaptation, use of weightings to give particular focus linked to the question or aim. • Consideration of equipment, and how that is used to minimise operator error during and improve reliability of conclusions.

		- Ethical and socio-political implications could be considered e.g. appropriateness of questionnaire questions. This impacts on both the range and quality of data and in turn has effects upon the accuracy of the results and the validity of conclusions - Conclusions could be referred to if data collection yielded unusual / unexpected / anomalous results which affected the reliability / validity of conclusions. - Inaccessibility of sites / lack of ability collect data due to time of day, seasons, or unanticipated hazards such as bad weather – which may, or may not, have hindered ability to collect sufficient / sufficiently high quality data to answer the hypothesis. Accept references to secondary data, but it is likely to be harder to evaluate accuracy and reliability. All judgements are likely to be partial and tentative given the limited range of primary sources used. Do not accept fieldwork contexts for Regenerating Places and Diverse Places.
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	- Shows evidence that fieldwork investigation skills used may not have been fully appropriate or effective for the investigation of the geographical questions/issue. (AO3) - Considers the fieldwork investigation process/data/evidence, with limited relevant connections and/or judgements. (AO3) - Argument about the investigation is simplistic and/or generic. (AO3)
Level 2	4–6	- Shows evidence that fieldwork investigation skills used were largely appropriate and effective for the investigation of the geographical questions/issue. (AO3) - Critically considers the fieldwork investigation process/data/evidence in order to make some relevant connections and valid judgements. (AO3) - Argument about the investigation may have unbalanced consideration of factors, but is mostly coherent. (AO3)
Level 3	7–9	- Shows evidence that fieldwork investigation skills used were appropriate and effective for the investigation of the geographical questions/issue. (AO3) - Critically considers the fieldwork investigation process/data/evidence in order to make relevant connections and judgements that are supported by evidence. (AO3) - Argument about the investigation includes balanced consideration of factors and is fully developed and coherent. (AO3)

Question number	Evaluate the extent to which physical processes threaten the environmental value of Kenya's Rift Valley. Answer
4	AO1 (4 marks)/AO2 (12 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only AO1 without any AO2 should be awarded marks as follows: • Level 1 AO1 performance: 1 mark • Level 2 AO1 performance: 2 marks • Level 3 AO1 performance: 3 marks • Level 4 AO1 performance: 4 marks Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: AO1 • Relict and active glaciated landscapes have environmental and cultural value – research, wilderness, recreation and spiritual / religious associations. • Climate warming is a context risk, meaning that successful management of these unique and fragile landscapes is increasingly challenging. • Tectonic processes operate at convergent / constructive plate margins. • Volcanic activity produces ash fall and gas eruptions. AO2 Physical processes threaten environmental value • Mt Kenya – there is significant risk of damage from glacial retreat both for the cultural beliefs of the Kikuyu but also for the water supply across Kenya as a whole. These processes are likely to be irreversible. • Menengai Crater – geothermal activity is attracting investment, which in turn might displace the Maasai people groups. On the other hand, there is no evidence of glacial processes and the area is otherwise remote. • Lake Turkana is likely to be affected significantly by climate change affecting water levels in the lake. However, it is not clear whether this means water levels will increase or decrease. Physical processes don't threaten environmental value • Mt Kenya - The landscape is the by-product of constructive plate movement creating the rift valley with it's volcanic mountains (e.g. Mt Kenya) and low lying lakes (Lake Turkana). On the other hand, people have been drawn to these landforms and built their culture around them; now these landforms are changing. • Menengai Crater – There is no evidence of tectonic hazards in the Rift Valley; rather tectonic activity has shaped ancient cultural belief for the Maasai. However, this same activity both creates an opportunity for the to develop a green economy, but a threat to threaten the way for the Maasai people

Question number	Evaluate the extent to which physical processes threaten the environmental value of Kenya's Rift Valley.
	Answer - Central Island - Tectonic activity has created unique landscapes for scientific research at Central Island. However, building the Gebe III dam will certainly result in water level drop and this will probably cause a problem for the unique biodiversity and people groups surrounding Lake Turkana. There are other processes and threats to environmental value: - It is possible that developing an economy based around geothermal activity might help contribute to delaying rates of climate change and the associated retreat of glaciers on Mt Kenya. On the other hand, the building of this infrastructure might be a significant threat to local (spiritual) culture. Judgements and conclusions might be based around whether tectonics or glacial processes are causing the most change in the Rift Valley. Some candidates might choose to examine the balance in the context of each location. Most will probably conclude that glacial change is the bigger and more immediate threat. Some may observe that tectonics has merely created a series of relatively vulnerable landscapes and communities that depend upon them.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	- Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) - Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2) - Limited synthesis of geographical ideas from across the course of study. (AO2)
Level 2	5–8	- Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) - Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2)

		• Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2) • Argument partially synthesises some geographical ideas from across the course of study, but lacks meaningful connections. (AO2)
Level 3	9–12	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2) • Argument synthesises some geographical ideas from across the course of study, making some meaningful connections. (AO2) • Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1)
Level 4	13–16	• Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2) • Argument comprehensively and meaningfully synthesises geographical ideas from across the course of study throughout the response. (AO2)

Question number	Identify the landform marked X on the photograph. Answer	Mark
5(a) (i)	AO1 (1 mark) Award 1 mark for correctly identifying the landform. • Cliff ☐. • Wave cut notch ☐. • Headland ☐. • Raised beach / marine terrace ☐. • Geo ☐. Do not accept: • Arch • Stack • Wave cut platform • Terraced slope • Bay • Rotational slump	(1)

Question number	Calculate the range of wave height. Answer	Mark
5 (a) (ii)	A03 (2 marks) Allow up to 2 marks for correctly calculating the range of the data, with working out if required. Identification of max and minimum wave height from the graph ☐ • Maximum: 10.2m (accept up to 10.5m) • Minimum: 1m Result ☐ • 9.2m • Accept between: - o $10.5 - 1.0 = 9.5 \text{ m}$ - o $10.2 - 1.0 = 9.2 \text{ m}$ Allow 1 mark for error on reading values from the graph carried forward into the final calculation. Donot require the identification of both maximum and minimum. Ifthe correct final answer is present, there is no requirement for working out.	(2)

Question number	Suggest one physical process that has helped form this coastal landscape. Answer	Mark
5(a)(iii)	A01 (2 marks)/A02 (1 mark) Award 1 mark for suggesting a process that might have helped form the landscape with a further 2 extension marks to explain why this process has caused change: • Long fetch / storm waves / destructive waves might hit the coast / cliff ☐ causing hydraulic action as waves exploit faults / attrition as sediment is thrown at the cliff ☐ and repeated action can cause rock to breakdown / cliff to collapse / mass movement to occur / cliff retreat ☐. • The waves from the sea / marine processes erode the cliff face ☐ by abrasion as waves rub against the rock / causing debris to fall at the base of the cliff / removing relative softer or weaker rock ☐ slowing down the rate of erosion / which in turn speeds up the rate of erosion by attrition / creating small bays amongst the headlands ☐. • Subaerial / rock breakdown / weathering processes / such as freeze-thaw / oxidation ☐ have caused water in cracks in the rock to expand as it freezes / oxygen to react with the rock / put pressure on the surrounding rock ☐ causing it to fracture / break away / making it more vulnerable to erosion ☐.	

	- Heavy rain saturates the rockface / slope □ increasing sheer strength / increasing pore water pressure □ leading to an arc of failure / mass movement together / overwhelming sheer strength □ . - The cliff is seaward dipping □ so it more vulnerable to marine processes undercutting at the cliff base / bedding planes act as natural slip planes / water infiltrating the rock can weaken bedding planes □ so massive slabs of rock and sediment can slide down into the water / more easily collapse into the sea □. - Debris at the base of the cliff might be picked up by waves □ causing attrition as material is thrown at the cliff □ causing the rock to breakdown / be eroded □. - The sea-level might have fallen / relative sea level fall / isostatic sea level change □ as a result of isostatic rebound / glaciers melting in upland UK / plate tectonic movement causing uplift □ leaving a former coastline / raised beach exposed at a higher altitude than before □. Note the mark scheme content is indicative, so processes such as attrition / hydraulic action / abrasion are applicable to the different bullet points above. As with 5ai, although the coastline on the isle of Skye is not a raised beach, suggestions about isostatic sea-level change and processes associated with emergent coastlines are a reasonable response to Figures 5a. Accept any other appropriate response.	(3)
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Question number	Explain two features of emergent coastlines. Answer	Mark
5(b)	AO1 (4 marks) For each landform, award 1 mark for explaining how it is formed because of sea-level rise and a further 1 mark expansion for developing this explanation, up to a maximum 2 marks each. For example: - Fossil cliffs / raised beaches are the result of falling sea-level relative to land / isostatic change □ which exposes cliffs / beaches that formed at the previous edge of the sea / when the sea-level was much higher / which is the result of climate change or glaciers melting or mining or oil extraction □. - Raised beaches can be formed due to rapid uplift of land / are former wave cut platforms □ perhaps because of dramatic tectonic events / isostatic readjustment / which can now be covered by vegetation □. - Fossil cliffs can have what look like wave-cut notches and caves □ which formed when the sea-level was previously in contact with the rock / are now covered by vegetation □.	

	There is likely to be a lower / contemporary cliff / talus slopes because the sea / marine processes continue to erode / break down rock that is still exposed to the sea □.	
	Accept any other reasonable responses.	(4)

Question number	Explain how the effects of climate change on coastlines may create environmental refugees. Answer	
5(c)	AO1 (6 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: - Climate change is likely to cause eustatic sea-level rise that might eventually inundate low-lying isolated communities, e.g. Pacific Islands. - Sea-levels rise is faster for some low-lying isolated islands (e.g. Marhsall Islands) than the rest of the world, and coastal defences are insufficient to protect communities. - Storm surge events can result in catastrophic changes to low-lying or coastal communities that then have nowhere to evacuate too, or it is not viable to rebuild their settlements. - Sea-surface temperatures might rise, resulting in stress to coral reefs that mean is it not economically viable to remain on the island. - Some may note that Environmental forces are not currently recognized as a cause of displacement – i.e. that the term environmental refugees is not an officially recognized term. Accept any other reasonable response.	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	- Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) - Understanding addresses a narrow range of geographical ideas, which lack detail. (AO1)
Level 2	3–4	- Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) - Understanding addresses a range of geographical ideas, which are not fully detailed and/or developed. (AO1)
Level 3	5–6	- Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) - Understanding addresses a broad range of geographical ideas, which are detailed and fully developed. (AO1)

Question number	Assess the extent to which the successful management of coastal landscapes is helped by an understanding of sediment cells. Answer
5(d)	A01 (3 marks)/A02 (9 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only A01 without any A02 should be awarded marks as follows: • Level 1 A01 performance: 1 mark • Level 2 A01 performance: 2 marks • Level 3 A01 performance: 3 marks. Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: A01 • The sediment cell concept involves sources, transfers and sinks. • Rapid coastal recession is caused by a range of physical factors (geological and marine) but can also be influenced by human actions (dredging or coastal management). • The rate of coastal recession can also be controlled by a combination of subaerial processes (weathering and mass movement) • The rate of recession is not constant, varying on different time scales according to wind direction / fetch, tides, seasons, weather systems and occurrence of storms. • There are different approaches to managing the risks associated with coastal recession. • Management policies range from No Active Intervention, Strategic Realignment, Hold the Line and Advance the Line. They are based on complex judgements about engineering feasibility, environmental sensitivity, land value and other political and social factors. • Successful management is increasingly challenging, with a need for coordinated approaches; homeowners, local authorities, environmental pressure groups are examples of different players that might be involved. These decisions are made through Cost Benefit Analysis (CBA) and environmental Impact Assessment (EIA) A02 Understanding sediment cells is necessary to successfully managing coastal landscapes • Disruption to the input of a sediment cell will cause coastal recession elsewhere, either downdrift because of groynes / seawalls, or down river is river sediment is trapped behind a dam. Both scenarios starve the coast of sediment, leading to a lack of natural beach protection, e.g. Guinea Coastline. On the other hand, this might justify protecting one area of risk over another, depending on a cost-benefit analysis. • The dredging of sediment from a bay prevents the return of sediment from offshore banks during the summer months. In turn, this starves the beach of its natural sediment protection, making recession more

Question number	Assess the extent to which the successful management of coastal landscapes is helped by an understanding of sediment cells. Answer
	likely – e.g. Hallsands. On the other hand, this was the result of a conscious decision to prioritise the construction. • Sediment cells are an important part of Integrated Coastal Zone Management – the movement of sediment determines shoreline management plans in the UK which forces different local government groups to work together. On the other hand, this suggests the role of the central government in imposing this requirement is also required to achieve successful coastal management. • Sediment cells mean the removal of material in one place might be counterbalanced by the accretion of material elsewhere – e.g. the link between erosion in Holderness and deposition in Lincolnshire. This movement of material is likely to be cyclical and seasonal and requires monitoring so management decisions are not made based on incorrect data. On the other hand, if storm surges meant there was rapid or unexpected change, management decisions might be required to protect immediate loss of life. Understanding sediment cells isn't enough • Decisions about coastal management strategy must consider cost-benefit analyses, recognising that all options have an expense, i.e. 'do nothing' might not be acceptable and Advance the Line might not be necessary, e.g. at Selsey Bill. regarding coastal management are based on Environmental Impact Assessments and cost benefit analyses. That said, the impact of the decision on surrounding sediment units must still be considered. • Sometimes the risk of coastal recession has been created by decisions made by people too close to the coastline (e.g. Pacifica, California) or the result of engineering that disrupts wave dynamics (e.g. Portballintrae, County Antrim). That said, these decisions also influence the sediment cell • The causes of recession are not always due to the amount of beach sediment, e.g. mass movement could be the result of subaerial processes, heavy rainfall and complex geology. • Coastlines are more complex than just a sediment cell, for example, the movement of water from offshore regions, the geology of the shoreline / seabed, the role of estuaries and so on. For example, the recession in the southwest of Ireland is influenced by a combination of isostatic sea-level rise, discordant geology and river erosion. Nevertheless, longshore drift (and sediment cells) are still part of that system. Not all coastlines have clear sediment cells – some cells are open, or the • coastal topography is too varied. E.g. much of the coastline of Scotland. There are other issues to manage in sediment cells • Sediment cells can also help researchers understand dynamic equilibrium, and what might disturb that, for example, by pollution off the coast of Northern France. • Climate change introduces multiple, and interacting threats, which required a co-ordinated approach that might suffer from lack of agreed decision making, or funding. There might be disagreement on the causes of the threat. On the other hand, the urgency might stimulate stakeholders to act more decisively

Question number	Assess the extent to which the successful management of coastal landscapes is helped by an understanding of sediment cells. Answer
	Judgements might be based around whether sediment cells should form the basis for coastal management decisions. Some candidates might reflect on other factors that influence these decisions, but most will probably conclude that understanding coastal dynamics in the cell is more likely to be successful.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2) • Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgements about the significance of few factors, leading to an argument that is unbalanced or lacks coherence. (AO2)
Level 2	5–8	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to make judgements about the significance of some factors, to produce an argument that may be unbalanced or partially coherent. (AO2) Demonstrates accurate and relevant geographical knowledge and
Level 3	9–12	• understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to make supported judgements about the significance of factors throughout the response, leading to a balanced and coherent argument. (AO2)

Question number	Complete the bar graph. Answer	Mark
6(a)(i)	A03 (1mark) Award 1 mark for the correctly drawn bar ☐. Distance from the left edge of the path (cm) The top of the bar should reach 32%.	(1)

Question number	Identify which sample point had the highest amount of bare ground. Answer	Mark
6(a)(ii)	A03 (1 mark) Award 1 mark for the correctly identified sampling strategy. B – 60m ☐ A, C D would be an incorrect reading of the axis	(1)

Question number	Identify the sampling strategy the students used to measure tramplage across the path. Answer	Mark
6(a)(iii)	A03 (1 mark) Award 1 mark for the correctly identified sampling strategy. D – Systematic ☐ A, B and C are not correct, because the measurements were taken every 20 metres.	(1)

Question number	Suggest one other primary data collection method (fieldwork) the students could use to develop this investigation. Answer	Mark
6(a)(iv)	A03 (2 marks) For each type of fieldwork, award 1 mark for identifying a method, and a further 1 mark for justification of why it extends the investigation: • Field sketching / photos ☐ might help show the extent / causes of the trampling / failure of management strategies / compare the impact of walkers at different places ☐. • Biodiversity survey / quadrat sampling ☐ to analyse the impact walkers are having on the ecosystem / if some plant species are more resilient than others ☐. • Measuring the infiltration rate at different parts of the path ☐ to see how compacted the ground is ☐. • Interviews with walkers / local landowners / footfall counts ☐ might help understand why / when the trampling is at its worst / how they feel about the impact on the footpath / how many people use the footpath ☐. • Complete a litter survey ☐ to see if there is a correlation between litter and footpath damage ☐. Accept any other reasonable response. Methods may refer to secondary data for comparison but must include a primary data collection method	(2)

Question number	Explain two ways the students could have used secondary data to plan this fieldwork. Answer	Mark
6(a)(v)	A03 (4 marks) Award 1 mark for explaining an a way ICT can be used for this fieldwork scenario and a further expansion of up to a maximum of 2 marks each. • Use a weather app / map / forecast to check on the weather conditions ☐ to ensure it was safe to travel / decide what clothing to wear in an exposed environment ☐. • Use an OS map / GIS map / SatNav to plan their journey ☐ so they can park close to the location / check they can access the location safely / legally) / how long it will take to travel between locations / plan a sampling strategy ☐. • Use fieldwork data collected over previous years about the footpath / GIS or layered map with background data / footfall data ☐ to judge whether the problem has got better or worse / identify hotspot locations where the problem is likely to be bigger ☐. • Look at previous student projects ☐ to plan to revisit the same locations as a comparison / learn from their evaluations ☐. • Looked at old photographs / satellite photos of the area online ☐ to see whether the sand dunes had been damaged in the	

	past / establish if there are specific sites where sand dunes have been damaged □ . • Look for articles / news stories / social media / published management plans about the area □ to establish the background of the management strategies / when it was implemented / why it was implemented / how long it has been damaged / establish a hypothesis for what they expected to find □. Accept any other appropriate response. NB – The command word 'Explain' in this context requires reference to the fieldwork scenario.	(4)
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Question number	Assess the validity of the conclusions to your fieldwork investigation. Answer
6(b)	A03 (9 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Indicative content guidance <i>Please remember that the descriptor provides guidance as to the appropriate level. Bullet points covering the indicative content do not translate directly into marks.</i> Content depends on students' choice of research question, but might include • Fieldwork techniques • Sampling Strategies Links between fieldwork techniques and the resulting geographical enquiry question should be clear • Accuracy and reliability will be affected by sampling and frequency of the fieldwork methods. Accuracy includes having appropriate methods of sampling or data collection which will reduce error and be close to the true value. • Inaccurate data might have led to a wrong conclusion. Equally, inaccurate data collected about a factor that is not relevant to the geographical enquiry question might also reduce the reliability of the conclusions. • Reliability refers to the likelihood that a repeated pieces of data collection would yield the same result. This might be because of sampling strategies (systematic / random / stratified) or the timing of the measurements (e.g. are measurements being made in summer vs. winter when the number of tourists might naturally expect to be different). Locational considerations, especially precise details of sites, or transects and sampling locations will impact on the accuracy and reliability of the conclusions. • Consideration of recording sheets (methods), adaptation, use of weightings to give particular focus linked to the question or aim. • Consideration of equipment, and how that is used to minimise operator error during and improve reliability of conclusions. • Ethical and socio-political implications could be considered e.g. appropriateness of questionnaire questions. This impacts on both the

	range and quality of data and in turn has effects upon the accuracy of the results and the validity of conclusions • Conclusions could be referred to if data collection yielded unusual / unexpected / anomalous results which affected the reliability / validity of conclusions. • Inaccessibility of sites / lack of ability collect data due to time of day, seasons, or unanticipated hazards such as bad weather – which may, or may not, have hindered ability to collect sufficient / sufficiently high quality data to answer the hypothesis. Accept references to secondary data, but it is likely to be harder to evaluate accuracy and reliability. All judgements are likely to be partial and tentative given the limited range of primary sources used. Do not accept fieldwork contexts for Regenerating Places and Diverse Places.
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Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Shows evidence that fieldwork investigation skills used may not have been fully appropriate or effective for the investigation of the geographical questions/issue. (AO3) • Considers the fieldwork investigation process/data/evidence, with limited relevant connections and/or judgements. (AO3) • Argument about the investigation is simplistic and/or generic. (AO3)
Level 2	4–6	• Shows evidence that fieldwork investigation skills used were largely appropriate and effective for the investigation of the geographical questions/issue. (AO3) • Critically considers the fieldwork investigation process/data/evidence in order to make some relevant connections and valid judgements. (AO3) • Argument about the investigation may have unbalanced consideration of factors, but is mostly coherent. (AO3)
Level 3	7–9	• Shows evidence that fieldwork investigation skills used were appropriate and effective for the investigation of the geographical questions/issue. (AO3) • Critically considers the fieldwork investigation process/data/evidence in order to make relevant connections and judgements that are supported by evidence. (AO3) • Argument about the investigation includes balanced consideration of factors and is fully developed and coherent. (AO3)

Question number	Evaluate the extent to which physical processes threaten the environmental sensitivity of these Hawaiian Islands. Answer
7	AO1 (4 marks)/AO2 (12 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Responses that demonstrate only AO1 without any AO2 should be awarded marks as follows: • Level 1 AO1 performance: 1 mark • Level 2 AO1 performance: 2 marks • Level 3 AO1 performance: 3 marks • Level 4 AO1 performance: 4 marks Indicative content guidance The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: AO1 • The causes of volcanoes associated with hot spots from mantle plumes. • Hard engineering approaches are economically cost and directly alter physical processes and systems • Actions by different players may have unforeseen consequences. • Policy decisions are based on complex judgements, including environmental sensitivity, as well as political and social reasons. • Economic losses and social losses from coastal flooding can have serious economic and social consequences for coastal communities. AO2 Physical processes threaten environmental sensitivity • The islands are exposed to powerful waves and coastal flooding, and this is particularly a treat for the landscape, and key infrastructure, on Maui. On the other hand, the communities on this island have taken a decision to work with nature and adopt a strategy of managed retreat. • Severe coastal erosion is creating problems on the coastline of the northerly and older islands. However, this island is also the most highly populated and where coastal defences are being implemented. • Hawaii's Big Island is a constantly erupting hotspot island, and this creates potential economic loss. However, the monitoring and management systems are strong and there is little evidence of the consequences of tectonic activity on any of the islands. Physical processes don't threaten environmental sensitivity • Physical processes are used to reinforce deep cultural beliefs about the island, including its historical context. However, this connection highlights the importance of respect for natural processes, rather than complacency. The tectonic processes are also creating isostatic sea-level rise on 'Big Island'. • There is recognition that hard engineering has done significant damage to some of the coastline as sand has been washed away because of seawalls. However, the threat from flooding and erosion remains and locals have had to invest in sand-bags to protect their properties on both

Question number	Evaluate the extent to which physical processes threaten the environmental sensitivity of these Hawaiian Islands. Answer
	the islands of Oahu and Maui, the latter depends significantly on visitors to its stunning landscapes. - There seems to be antipathy towards the government, suggesting that local stakeholders are better able to manage the threats created by predominantly coastal processes, particularly on Oahu. However, the role of government and armed forces is much stronger on Big Island, suggesting that physical processes can overwhelm the decision making of local communities. Other processes also threaten environmental sensitivity - Overtourism is a potential threat to these islands, particularly on the northern / older ones and these might threaten the beauty of the landscape. However, the government is stepping in to manage these problems in more sensitive ways. Judgements and conclusions might be based around whether tectonics or coastal processes are causing the most change across the Hawaiian Islands. Some candidates might choose to examine the balance in the context of each location. Most will probably conclude that coastal change is the bigger and more immediate threat on the basis that tectonic processes are well managed. Some may observe that tectonics has merely created a series of relatively vulnerable landscapes and communities that depend upon them.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–4	- Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) - Applies knowledge and understanding of geographical information/ideas, making limited and rarely logical connections/relationships, to produce an interpretation with limited relevance and/or support. (AO2) - Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2) - Limited synthesis of geographical ideas from across the course of study. (AO2)
Level 2	5–8	- Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) - Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2)

		• Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2) • Argument partially synthesises some geographical ideas from across the course of study, but lacks meaningful connections. (AO2)
Level 3	9–12	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2) • Argument synthesises some geographical ideas from across the course of study, making some meaningful connections. (AO2) • Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1)
Level 4	13–16	• Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2) • Argument comprehensively and meaningfully synthesises geographical ideas from across the course of study throughout the response. (AO2)