Mark Scheme (Results)

Summer 2023

Pearson Edexcel International GCSE in Geography (4GE1)
Paper 1: Physical Geography

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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.

Marking guidance for levels-based mark schemes

How to award marks
The indicative content provides examples of how students will meet each skill assessed in the question. The levels descriptors and indicative content reflect the relative weighting of each skill within each mark band.

Finding the right level
The first stage is to decide which level the answer should be placed in. To do this, use a 'best-fit' approach, deciding which level most closely describes the quality of the answer. Answers can display characteristics from more than one level, and where this happens, markers must use the guidance below and their professional judgement to decide which level is most appropriate.

Placing a mark within a level
After a level has been decided on, the next stage is to decide on the mark within the level. The instructions below tell you how to reward responses within a level. However, where a level has specific guidance about how to place an answer within a level, always follow that guidance. Statements relating to the treatment of students who do not fully meet the requirements of the question are also shown in the indicative content section of each levels-based mark scheme. These statements should be considered alongside the levels descriptors.

Markers should be prepared to use the full range of marks available in a level and not restrict marks to the middle. Markers should start at the middle of the level (or the upper-middle mark if there is an even number of marks) and then move the mark up or down to find the best mark. To do this, they should take into account how far the answer meets the requirements of the level:

- if it meets the requirements fully, markers should be prepared to award full marks within the level. The top mark in the level is used for answers that are as good as can realistically be expected within that level
- if it only barely meets the requirements of the level, markers should consider awarding marks at the bottom of the level. The bottom mark in the level is used for answers that are the weakest that can be expected within that level
- the middle marks of the level are used for answers that have a reasonable match to the descriptor. This might represent a balance between some characteristics of the level that are fully met and others that are only barely met.

Question number	Answer	Mark
1(a)	AO1 (1 mark) A Amount of rainfall (1) The answer cannot be B, C or D as these are human factors.	(1)

Question number	Answer	Mark
1(b)(i)	AO1 (1 mark) B A bend in a river (1) The answer cannot be A (sediment), C (river source), or D (river mouth).	(1)

Question number	Answer	Mark
1(b)(ii)	AO1 (1 mark) Award 1 mark for any of the following. • Hydraulic action (1) • Abrasion / corrasion (1) • Attrition (1) • Solution / corrosion (1) • Vertical / lateral / horizontal (1) Accept any other appropriate response.	(1)

Question number	Answer	Mark
1(c)	AO1 (1 mark)/AO2 (1 mark) Award 1 mark (AO1) for identification of a suitable way and a further mark for explanation of the reason (AO2) up to a maximum of two marks. • Agriculture can lead to run off of chemicals into the river (1) which can cause eutrophication (1) . • Industries can leak waste into rivers (1) causing pollution (1). • Sewage works can lead to treated water entering rivers (1) which can change the biotic/abiotic characteristics of rivers (1). • Presence of a power station can lead to warming of water (1) which changes the type of plants and animals that can live in the river (1). • Water treatment works clean the water (1) which can increase water quality (1).	

	• Fuel leaking from boats (1) can decrease water quality (1). Accept any other appropriate response.	(2)

Question Number	Answer	Mark
1(d)	AO2 (2 marks)/AO3 (2 marks) Award 1 mark (AO3) for the identification of a way river changes and a further mark for explanation of how this changes long a river course (AO2) up to a maximum of two marks each. • Velocity increases from upper to lower course (1) due to less friction with river bed and banks (1). • Deposition increases (1) due to decrease in energy (1). • Steep slopes in the upper course (1) creating rapid run off and a short lag time (1). • River channel can become wider (1) as erosion occurs (1). • River begins to form meanders (1) as more lateral erosion takes place (1). • River increases in depth (1) as not tributaries join (1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
1(e)	AO2 (3 marks) Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. Candidates could identify: • An increase in river volume can lead to floods (1) which deposits silt on sides of rivers (1) and this builds up over time (1). • When a flood occurs, water burst the river banks (1) and deposits silt on each side (1) and further floods add each time to change the height of the river bank (1). Accept any other appropriate response. Credit an annotated diagram but avoid double crediting marks awarded in text written on lines provided.	(3)

Question number	Answer	Mark
1(f)	AO3 (1 mark) Award 1 mark for the following: • River mouth / mouth (1).	(1)

Question number	Answer	Mark
1(g)	AO1 (2 marks) AO2 (2 marks) Award 1 mark for initial point (AO1), and a further mark (AO2) for the extension of this point. Candidates may focus on either human or physical causes of flooding. • Heavy rainfall (1) which can transfer to river channels to cause an increase in discharge (1). • Steep slopes (1) which can reduce infiltration so more overland flow (1). • Melting glaciers/ice caps (1) can an increase in run off which makes river discharge higher (1). • Expanding urban areas (1) which increase impermeable surface and surface run off (1). • Deforestation (1) reducing interception of rainfall by plants (1). • Storm surges (1) can increase water levels in estuaries causing flooding (1). • Poorly maintained flood defences (1) are often unable to cope with the pressure of increased discharge causing them to break (1). Accept any other appropriate response.	(4)

Question number	Answer indicative content
1(h)	AO3 (4 marks) AO4 (4 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level-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. This question is about analysing why water supplies need to be managed. Candidates will need to be able to identify the different ways water is used, and why it is important that water resources are conserved through interrogation of the resource. AO3 • Water is used in various activities from providing drinking water, to as a resource for different industrial sector, from water for irrigation and livestock to providing water for factories. • Consumption habits in many developed countries can mean that high quantities of water are consumed frequently, for daily activities (e.g. washing machines), but also leisure activities (e.g. swimming pools). But many of these countries also experience water shortages in different areas of the country and at different times of the year. • Rainfall is not even across the year so dry periods can lead to water shortages if water is not managed effectively. Climate change may lead to different rainfall patterns or longer periods with less rainfall, in extreme circumstances causing shortages. • Population patterns will lead to higher patterns of water consumption which might not correspond to where water supplies are abundant so the ability to transfer water to areas where there is a deficit is important. AO4 • Figure 1c shows the different levels of water use across the USA. • Figure 1d shows how human activities drive a range of water uses, for different economic sectors, but also as a vital part of daily lives. • Figure 1d shows how the water consumption of the USA is significantly higher than those from countries which could be considered developing countries. • Figure 1d highlights how consumption in the USA may not be recognised as such, for example through electricity consumption or along the supply chain of beef production.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
2(a)	AO1 (1 mark) C Spit The answer cannot be A, B or D as these are all coastal landforms created by erosion.	(1)

Question number	Answer	Mark
2(b)(i)	AO1 (1 mark) B Waves hit the cliffs forcing pockets of air into cracks. The answer cannot be A (attrition), C (transportation/longshore drift) or D (solution).	(1)

Question number	Answer	Mark
2(b)(ii)	AO1 (1 mark) Award 1 mark for any of the following. • Physical weathering / mechanical weathering (1). • Freeze-thaw weathering (1). • Onion-skin weathering (1). • Biological weathering (1). • Chemical weathering (1). Accept any other appropriate response. No credit for 'acid rain'	(1)

Question number	Answer	Mark
2(c)	AO1 (1 mark)/AO2 (1 mark) Award 1 mark (AO1) for initial point and a further mark for explanation of the reason (AO2) up to a maximum of two marks. • Pollution of (from tourist boats can pollute) the water (1) can damage coral reef ecosystems (1). • Deforestation of mangrove trees (1) can increase vulnerability during storm surges (1). • Overfishing/fishing (1) can reduce biodiversity in coastal ecosystems (1). • Climate change/greenhouse effect (1) can lead to coral bleaching (1).	

	• Pollutes the sea (1) which can kill animals (1). Accept any other appropriate response.	(2)

Question number	Answer	Mark
2(d)	AO2 (2 marks)/AO3 (2 marks) Award 1 mark (AO3) for identification of any factor and a further mark for explanation of the reason (AO2) up to a maximum of two marks each. • Geology (1) as areas of soft rocks such as limestone are more easily eroded than hard rock areas (1). • Strength of prevailing winds (1) which can causes waves to erode more material from the coast (1). • Presence or absence of coastal management (1) to protect the coastal environment from erosion (1). • Vegetation present on the coastline (1) can cause erosion of cliffs through biological weathering (1). • Change in the direction of the coastline (1) can lead to spit formation 1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
2e	AO2 (3 marks) Award 1 mark for initial point and 2 marks for further explanation up to a maximum of 3 marks. • Prevailing wind blows waves to the beach at angle (1), the backwash then drags the sediment back to the sea (1) and the sediment is moved along the beach (1). • Swash carried materials up the beach at an angle to the coast (1) backwash carries it back down at rights angles to the coast (1) which carries material along the beach in a zig-zag pattern. Accept any other appropriate response.	(3)

Question number	Answer	Mark
2(f)	AO3 (1 mark) Award 1 mark for the following: • Groynes (1).	(1)

Question number	Answer	Mark
2(g)	AO1 (2 marks) AO2 (2 marks) Award 1 mark for initial point (AO1) for advantage and disadvantage and a further mark (AO2) for each. Only award marks for one advantage and one disadvantage up to maximum of 4 marks. • Advantages: o Strategies such as managed retreat are cheaper than alternatives (1) because they do not involve building any new structures (1). o Soft engineering protects the coast from erosion (1) as sand dune regeneration reduces the power of the waves (1). o Beach replenishment which involves adding more sand to the beach (1) creates a natural defence against erosion. o They look natural (1) which makes them more aesthetically pleasing (1). • Disadvantages: o Strategies such as beach replenishment need to constantly be replaced (1) which can be expensive (1). o Strategies such as beach reprofiling which involves moving sand towards the upper part of the beach (1) is not very effective against strong waves (1). o Not as effective as hard engineering (1) as works with nature to reduce rather then prevent erosion (1). o They can be considered ugly (1) when old sea defences are left to breakdown with managed retreat (1). Accept any other appropriate response.	(4)

Question number	Answer indicative content
2(h)	AO3 (4 marks) AO4 (4 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level-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. The question is about analysing the different coastal management strategies used and how effective they were at reducing risk from tropical cyclones in the region. AO3 • Flood prevention often involves a mixture of hard (e.g., dams/levees/flood relief channels) and soft engineering strategies (e.g., flood warnings and preparation/ floodplain zoning/ecological flooding). • It is important that flood protection involves a mix of both soft and hard engineering in order to not only have structures to physically protect coast, but also mechanisms to ensure minimal risk to losing lives such as effective early warning systems which can allow people time to evacuate. • Coastlines are vulnerable to flooding due to tropical cyclones, storm surges and the impact of climate change. • Low lying coastlines are particularly at risk and so require hard engineering to protect them. AO4 • Figure 2c shows how the whole coastline is at high risk of coastal flooding which justifies a mixture of different coastal prevention strategies. • Figure 2c indicates how coastlines are vulnerable to coastal floods (due to rain from Hurricane Katrina) which caused high levels of destruction which justifies high levels of investment in flood prevention strategies. • Figure 2d shows how flood prevention strategies have included flood walls, water pump stations and levees. • Figure 2d suggests that levees have been very expensive (US$14 billion after Hurricane Katrina) but may not provide long term protection.

Question number	Answer	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
3(a)	AO1 (1 mark) A Landslide (1) The answer cannot be B (associated with volcanoes), C or D (associated with tropical cyclones).	(1)

Question number	Answer	Mark
3(b)(i)	AO1 (1 mark) C Tectonic plates that pull apart (1). The answer cannot be A (collision), B (collision, destructive), or D (conservative).	(1)

Question number	Answer	Mark
3(b)(ii)	AO1 (1 mark) Award 1 mark for a suitable definition of hotspot. • An area of tectonic activity away from a plate margin (1). • Magma plumes that create volcanoes in areas of thin crust (1). • Magma plume hotter than surrounding magma (1). Accept any other appropriate response.	(1)

Question number	Answer	Mark
3(c)	AO1 (1 mark)/AO2 (1 mark) Award 1 mark (AO1) for identification of correct impact suitable way and a further mark for explanation (AO2) up to a maximum of two marks. • Earthquake drills (in schools) (1) to ensure people know how to respond to earthquakes (1). • Governments to send out leaflets (1) to ensure people know where to shelter during an earthquake (1). • Emergency service drills (1) to try and reduce the number of lives lost during an earthquake event (1). • Building earthquake-proof buildings (1) to reduce the number that collapse (1). • Secure furniture (to walls/floor) (1) to reduce risk of injury (1). Accept any other appropriate response.	(2)

Question number	Answer	Mark
3(d)	AO2 (2 marks)/AO3 (2 marks) Award 1 mark (AO3) for identification of any reason and a further mark for explanation of the reason (AO2) up to a maximum of two marks each. • High wind speeds (up to 252kph) (1) can lead to damage to buildings and infrastructures (1). • Heavy rainfall that are associated with tropical cyclones (1) can cause flooding (1). • Strong winds (at Category 3 and above) (1) can cause storm surges (1) which can flood coastlines (1). • Vegetation might be damaged (1) at wind speeds above 178km (1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
3(e)	AO2 (3 marks) Award 1 mark for the identification of a suitable reason and 2 marks for further explanation up to a maximum of 3 marks. Candidates could identify: • Emergency aid can respond to short-term impacts of earthquakes (1) including providing immediate medical care and equipment for those injured (1) which can reduce the number of deaths (1). • Emergency aid such as provision of shelters can help reduce long-term impacts (1) such as homelessness (1) and can help people rebuild their lives (1). • Emergency aid in the form of financial support can help local areas get services active again (1) so have all the essential services they need (1) and so can reduce risks of death and illness (1). Accept any other appropriate response. No credit for just identifying an emergency aid strategy	(3)

Question number	Answer	Mark
3(f)	AO3 (1 mark) Award 1 mark for the following: • Eye (1)	(1)

Question number	Answer	Mark
3(g)	AO1 (2 marks) AO2 (2 marks) Award 1 mark for initial point (AO1), a further mark (AO2) for the extension of this point up to maximum of 2 marks. • Volcanoes can eject a mix of hot steam, ash rock and dust (1) which can form pyroclastic flows which can travel at high speeds (1). • Volcanoes can eject ash (1) which can cover things causing a lot of damage / respiratory problems (1). • Lava flows (1) can damage buildings / habitats (1). • If volcanic ash mixes with rainfall or meltwater lahars can form (1) which can set as hard as cement (1). • Pyroclastic flows (1) can incinerate buildings / infrastructure (1). • Volcanic eruptions can causes earthquakes (1) which can damage houses (1). • Volcanic eruptions can cause landslides (1) which can cause injury / death (1). Accept any other appropriate response.	(4)

Question number	Answer indicative content
3(h)	AO3 (4 marks) AO4 (4 marks) Note to examiners: There was a minor error in the key on Figure 3c, an erratum was read out to candidates at the start of the exam and individually included with the Resource booklet. The sequence in the resource booklet reads: <5, 5-24, 24-50, 50> It should read: <5, 5-24, 25-50, >50 Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level-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. This question is about analysing why some countries are more vulnerable to the impact of natural hazards. AO3 • There are a range of primary/immediate and secondary/long term impacts of earthquakes which can vary due to the size and intensity of the earthquake as well as the location. But these are likely to occur at plate margins (with the exception of hot spots). • A countries economic development may allow it to reduce people's vulnerability to the impact of natural hazards. For example, in California many buildings are reinforced so they are less likely to collapse during an earthquake events, which should lead to fewer deaths. • Developing countries that are located on plate margins may not have the capability of preparing or preventing hazard events from occurring to the same extent as developed countries. • In many cases the physical factors are also significant for example in Mexico City the risk of liquefaction due to the soils the city is built on makes it more vulnerable to severe damage if an earthquake occurs. AO4 • Fig 3c shows a map of average annual number people killed by seismic hazards. It indicated how there are concentrations of where people are killed by seismic hazards. • Figure 3c shows how the average number of deaths from seismic

	hazards follow the pattern of where plate margins are located, with concentrations in Central American and North India/around the Himalayas. • Figure 3d shows how countries with earthquake events with similar magnitude can have very different impacts in terms of the number of deaths and injuries. • Figure 3d shows information about the economic development of the country and the earthquake event from the USA has a much lower death and injury record than the events in Indonesia and Mexico.

Question number	Answer	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
4(a)	AO4 (2 marks) Award 1 mark for a suitable risk identified and 1 further mark for description of how this was managed. • Falling in the river (1) was managed by not getting to close the riverbank (1). • To reduce the risk of exposure (1) I made sure that I had suitable footwear and clothing (1). • There is a risk of slipping over (1) which can be reduced by wearing appropriate footwear (1). • There is a risk of getting lost (1) so we went around in groups (1). Accept any other appropriate response.	(2)

Question number	Answer	Mark
4(b)	AO4 (3 marks) Award 1 mark for initial point, and a further 2 marks for explanation or development. Candidates may refer to how the choices were made on a practical basis, but also in term of sampling strategy used. • We chose two sites to conduct our fieldwork (1) one which was just after a meander, and one that was on a straight section of the river (1) to see if we could find different characteristics (1). • We selected three sites along the river (1) that were in walking distance (1) as this allowed us time to collect the data one day (1). • We used stratified sampling (1) to collect readings from contrasting locations (1) to see how a river changes downstream (1). Accept any other appropriate response.	(3)

Question number	Answer	Mark
4(c)	AO3 (2 marks) /AO4 (2 marks) Award 1 mark for identification of a primary or secondary data collection method used and a further mark for development through further description or exemplification. Candidates can describe any two methods (primary and/or secondary) of data collection that are appropriate to their enquiry. • I collected data to look at the depth (1) of the river along its profile. We did this by using a metre ruler and measuring the depth at regular intervals (1). • I collected data on sediment size (1) by measuring pebbles at different points along the river (1). • I used a Power's Roundness Scale (1) to identify the shape of the sediment (1). • I drew field sketches (1) to record the landforms/characteristics of each site (1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
4(d)	AO4 (3 marks) Award 1 mark for identification of data analysis technique used, and a further mark for development through further description or exemplification. • I calculated the mean (1) by adding up each of the velocity readings and dividing by 5 (the number of times I recorded data) (1) to try and smooth out any variations in the data (1). • Used Spearman's rank (1) to compare sediment size and shape (1) to determine if the correlation is significant (1). • Calculated a percentage (1) as they are relative (1) which means different sets of data can be compared (1).	

	• Calculated the interquartile range (1) to remove the outliers in the data (1) in case they caused by human error in data collection (1). Accept any other appropriate response. No credit awarded for identifying a data presentation technique.	(3

Question number	Answer indicative content
4(e)	AO3 (4 marks) AO4 (4 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level 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. This question is about the candidates being able to evaluate whether the data presentation techniques used are effective in helping them analyse and identify patterns in the data. The data presentation techniques may be regarded as not appropriate for the data being presented leading to a judgement being made on how helpful they would be in analysis. • At level 1 candidates will be likely describe the data presentation methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as make simple statements about how they demonstrate patterns. • For level 3 candidates would be expected to make a judgement on the suitability of the presentation techniques and how they establish patterns or not. AO3 • Recognition that the data presentation techniques used are appropriate to the data that is being presented − and can help to identify trends and anomalies. • Recognition of the importance of having accurate/specific axis labels on the data presentation techniques. • Recognition that there are improvements/alternatives which could increase the usefulness of the data presentation techniques provided.

	• Recognition that there are limitations to the data presentation techniques used. • An evaluation of how far the student's data presentation methods can be trusted / may be provided. AO4 • Figure 4a shows a scatter graph comparing river discharge and average bedload size. • Figure 4a does not show which plot represents which site along the river the data was collected. • Figure 4a shows average sediment size but does not give detail about how many data points this is based on. • Figure 4b shows a bar graph showing velocity and discharge at each site. • Figure 4b has an X axis labelled size which is not very clear for discharge/velocity data. • Figure 4b numbers the sites but does not identify where the sites were located.

Question number	Answer	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)

Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
5(a)	AO4 (2 marks) Award 1 mark for a suitable risk identified and 1 further mark for description of how this was managed. • Falling in the sea (1) was managed by not getting to close the sea with strong tides (1). • To reduce the risk of exposure (1) I made sure that I had suitable footwear and clothing (1). • There is a risk of slipping over (1) which can be reduced by wearing appropriate footwear (1). • There is a risk of getting lost (1) so we went around in groups (1). Accept any other appropriate response.	(2)

Question number	Answer	Mark
5(b)	AO4 (3 marks) Award 1 mark for initial point, and a further 2 marks for explanation or development. Candidates may refer to how the choices were made on a practical basis, but also in term of sampling strategy. • We chose two sites to conduct our fieldwork (1) one which was just after a groyne, and one that was on a section of coastline with no management (1) to see if we could find a difference in beach characteristics (1). • We selected three sites along the coastline (1) that were in walking distance (1) as this allowed us time to collect the data one day (1). • We used stratified sampling (1) to collect readings from contrasting locations (1) to see how coastal management affects beach characteristics (1). Accept any other appropriate response.	(3)

Question number	Answer	Mark
5(c)	AO3 (2 marks) /AO4 (2 marks) Award 1 mark for identification of a primary or secondary data collection method used and a further mark for development through further description or exemplification. Candidates can describe any two methods (primary and/or secondary) of data collection that are appropriate to their enquiry. • I collected data to look at the profile of the beach (1) by using a ranging pole and clinometer to measure changes in angle from shoreline to top of beach (1). • I collected data on sediment size (1) by measuring pebbles at different points along the beach (1). • I measured longshore drift (1) by throwing an orange into the sea and measuring distance travelled in 5 minutes (1). • I drew field sketches (1) to record the landforms/characteristics of each site (1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
5(d)	AO4 (3 marks) Award 1 mark for identification of data analysis technique used, and a further mark for development through further description or exemplification. • I calculated the mean (1) by adding up each of the pebble size measurements and dividing by 5 (the number of times I recorded data) (1) to try and smooth out any variations in the data (1). • Used Spearman's rank (1) to compare sediment size and shape (1) to determine if the correlation is significant (1). • Calculated a percentage (1) as they are relative (1) which means different sets of data can be compared (1). • Calculated the interquartile range (1) to remove the outliers in the data (1) in case they caused by human	

	error in data collection (1). No credit awarded for identifying a data presentation technique. Accept any other appropriate response.	(3

Question number	Answer indicative content
5(e)	AO3 (4 marks) AO4 (4 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level 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. This question is about the candidates being able to evaluate whether the data presentation techniques used are effective in helping them analyse and identify patterns in the data. The data presentation techniques may be regarded as not appropriate for the data being presented leading to a judgement being made on how helpful they would be in analysis. • At level 1 candidates will likely describe the data presentation methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as making simple statements about how they demonstrate patterns. • For level 3 candidates would be expected to make a judgement on the suitability of the presentation techniques and how they establish patterns or not. AO3 • Recognition that the data presentation techniques used are appropriate to the data that is being presented − and can help to identify trends and anomalies. • Recognition of the importance of having accurate/specific axis labels on the data presentation techniques. • Recognition that there are improvements/alternatives which could increase the usefulness of the data presentation techniques provided. • Recognition that there are limitations to the data presentation techniques used. • An evaluation of how far the student's data presentation methods can be trusted may be provided.

	AO4 • Figure 5a shows a scatter graph comparing distance along the beach and average sediment size. • Figure 5a does not make it clear whether 'distance along beach' is from shoreline to back of beach (top to bottom) or from one side of the beach to the other (west to east). • Figure 5a shows average sediment size but does not give detail about how many data points this is based on. • Figure 5b shows a bar graph showing pebble shape and size at site 1 and 10 site. • Figure 5b only has site 1 and 10 presented which means 8 sites are not shown on the graph.	
Question number	Answer	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark
6(a)	AO4 (2 marks) Award 1 mark for a suitable risk identified and 1 further mark for description of how this was managed. • Getting lost between data collection sites (1) was managed by using a map on google maps. (1). • To reduce the risk of exposure (1) I made sure that I had suitable footwear and clothing (1). • There is a risk of slipping over (1) which can be reduced by wearing appropriate footwear (1). • There is a risk of getting lost (1) so we went around in groups (1). Accept any other appropriate response.	(2)

Question number	Answer	Mark
6(b)	AO4 (3 marks) Award 1 mark for initial point, and a further 2 marks for explanation or development. Candidates may refer to how the choices were made on a practical basis, but also in term of sampling strategy. • We chose two sites to conduct our fieldwork (1) one which was in the city centre, and one that was on an outskirts (1) to see if we could find different characteristics (1). • We selected three sites around a town (1) that were in walking distance (1) as this allowed us time to collect the data one day (1). • We used stratified sampling (1) to collect readings from contrasting locations (1) to see how land use changes (1). Accept any other appropriate response.	(3)

Question number	Answer	Mark
6(c)	AO3 (2 marks) / AO4 (2 marks) Award 1 mark for identification of a primary or secondary data collection method used and a further mark for development through further description or exemplification. Candidates can describe any two methods (primary and/or secondary) of data collection that are appropriate to their enquiry. • I collected data to investigate the different in temperature (1) using a thermometer at dawn, midday and dusk (1). • I collected data on windspeed (1) by using an anemometer once a day for 10 days (1). • We recorded the amount of rainfall (1) using a range gauge placed in an open space to record volume (1). • I drew field sketches (1) to record the landforms/characteristics of each site (1). Accept any other appropriate response.	(4)

Question number	Answer	Mark
6(d)	AO4 (3 marks) Award 1 mark for identification of data analysis technique used, and a further mark for development through further description or exemplification. • I calculated the mean velocity at each site (1) by adding up each of the velocity readings and dividing by 5 (the number of times I recorded data) (1) to try and smooth out any variations in the data (1). • Used Spearman's rank (1) to compare rainfall and air pressures (1) to determine if the correlation is significant (1). • Calculated a percentage (1) as they are relative (1) which means different sets of data can be compared (1). • Calculated the interquartile range (1) to remove the outliers in the data (1) in case they caused by human error in data collection (1).	

	Accept any other appropriate response. No credit awarded for identifying a data presentation technique.	(3)

Question number	Answer indicative content
6(e)	AO3 (4 marks) AO4 (4 marks) Marking instructions Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level 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. This question is about the candidates being able to evaluate whether the data presentation techniques used are effective in helping them analyse and identify patterns in the data. The data presentation techniques may be regarded as not appropriate for the data being presented leading to a judgement being made on how helpful they would be in analysis. • At level 1 candidates will likely describe the data presentation methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as making simple statements about how they demonstrate patterns. • For level 3 candidates would be expected to make a judgement on the suitability of the presentation techniques and how they establish patterns or not. AO3 • Recognition that the data presentation techniques used are appropriate to the data that is being presented − and can help to identify trends and anomalies. • Recognition of the importance of having accurate/specific axis labels on the data presentation techniques. • Recognition that there are improvements/alternatives which could increase the usefulness of the data presentation techniques provided. • Recognition that there are limitations to the data presentation techniques used. • An evaluation of how far the student's data presentation methods can be trusted may be provided.

	AO4 • Figure 6a shows a scatter graph comparing average wind speed and rainfall. • Figure 6a does not show which plot represents the site at which the data was collected. • Figure 6a shows average wind speed but does not give detail about how many data points this is based on. • Figure 6b shows a bar graph of temperature and day for site 1 and 2. • Figure 6b numbers the day data was collected but does not identify where the sites were located.

Question number	Answer	
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

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