

Mark Scheme (Results)

November 2023

Pearson Edexcel International GCSE
In Geography (4GE1)
Paper 01: 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)** B The other examples are all other types of weather data.	**(1)**

Question number	Answer	Mark
1(b)(i)	**AO1 (1 mark)** D The answer cannot be A (reservoir), B (water treatment), C (rainwater harvesting)	**(1)**

Question number	Answer	Mark
1(b)(ii)	**AO1 (1 mark)** Award one mark for any of the following: • No inputs • No outputs • No water added • No water lost	**(1)**

Question number	Answer	Mark
1(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark (AO1) for initial point and a further mark for explanation (AO2) up to a maximum of two marks. River depth increases downstream (1) as more tributaries join the main channel increasing erosion (1) Rivers are shallow in the uplands (1) because velocity is lower (1) Rivers are deep in the lowlands (1) as velocity is higher (1) Accept any other appropriate response	**(2)**

Question number	Answer	Mark
1(c)	**AO2 (2 mark)/AO3 (2 mark)** Award 1 mark (AO3) for the identification of a difference between developed and developing/emerging countries and a further mark for explanation (AO2) up to a maximum of two marks each. • A bigger domestic usage in developed countries (1) as they have more income (1) • The biggest use in developed countries is industrial (1) as high amounts of electricity is used which uses water for generation (1) • A bigger agricultural usage in developing countries (1) as there is higher primary industry (1) • Domestic use is lowest in developing/emerging countries (1) as many homes do not have a mains water supply (1) • Developing countries have more use on farms (1) which means high water use for crops/livestock (1) Accept any other appropriate response	**(4)**

Question number	Answer	Mark
1(d)	**AO3 (1 mark)** Award one mark for the following: • Watershed (1)	**(1)**

Question number	Answer	Mark
1(e)	**AO1 (2 mark)/AO2 (2 mark)** Award 1 mark (AO1) for the identification of a physical factor and a further mark for explanation (AO2) up to a maximum of two marks each. • High levels of rainfall (1) increase amount of surface runoff increasing discharge (1) • Snowmelt (1) will increase discharge during spring as lots of water reaches river at same time (1) • Drainage basins with steep relief (1) can increase river discharge because it causes rapid surface runoff (1). • Drainage basins with lots of vegetation (1) increase	

	interception which reduces overland flow (1). • Drainage basins with permeable rock (1) can decrease river discharge as it encourages groundwater flow. • High stream density drainage basins (1) increase discharge as the tributaries deliver water quickly to the main channel (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO2 (3 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • Using flood/weather forecasting (1) by collecting data on amounts of precipitation in a drainage basin (1) allow warnings to be given to people at risk (1) • Monitoring the discharge of a river (1) to know whether water levels are high or low (1) to understand the impact precipitation could have river flow (1) • To record antecedent conditions in the drainage basin (1) to understand how saturated the ground is (1) and its capacity to absorb future rainfall (1) • Using historical records/hydrographs (1) to understand conditions that caused a flood (1) to know whether flooding is likely to occur (1) Accept any other appropriate response	**(3)**

Question number	Answer	Mark
1(g)	**AO3 (4 mark)/AO4 (4 mark)**	
	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 the impacts of China's south-north water transfer project as an example of a water supply strategy. Candidates will need to interpret the map to understand how water is being moved and consider whether the benefits in the north outweigh the costs in the south.	**(8)**

	AO3 • People in the south may not have enough water to drink leading to ill health. • People in the south may not have enough water for crops leading to food shortages. • The supply of water in the south may not meet demand in the future if population rises. • Climate change might change rainfall patterns in the region meaning the south is no longer a region of surplus. • The north of China has more cities and so a bigger population meaning the need is greater. • The project is likely to be very expensive. • The farming in the north will be maintained which is important for maintaining high crop yields. • Cities will be protected from land subsidence which will prevent expensive repair costs. **AO4** • Figure 1c shows four/five new water routes in China. • Figure 1C shows a Western, Central and Eastern water route. • Figure 1c shows water being moved from the Yangtze River to the Yellow River. • Figure 1c shows water being moved from Danjiangkou to Beijing. • Figure 1c shows the south have experienced drought. • Figure 1C shows water routes taking water to bigger cities on the east coast.	

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
2(a)	**AO1 (1 mark)** D The answer cannot be A (wavelength), B (cause of wave), C (backwash).	**(1)**

Question number	Answer	Mark
2(b)(i)	**AO1 (1 mark)** D The answer cannot be A (weathering), B (deposition), C (longshore drift).	**(1)**

Question number	Answer	Mark
2(b)(ii)	**AO1 (1 mark)** Award one mark for any of the following: • Cave (1) • Arch (1) • Bay (1) • Stack (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
2(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark (AO1) for initial point and a further mark for development (AO2) up to a maximum of two marks. • Coastlines with hard rocks are more resistant to erosion (1) and will erode more slowly (1) • Coastlines with hard rocks erode more slowly (1) leading to the creation of headlands (1) • Coastlines with soft rocks are less resistant to erosion (1) and will have fast erosion rates (1) • Coastlines with soft rocks erode faster (1) leading to the creation of bays (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
2(c)	**AO2 (2 mark)/AO3 (2 mark)** Award 1 mark (AO3) for the identification of an advantage and disadvantage and a further mark for explanation (AO2) up to a maximum of two marks each. **Advantage:** Managed retreat is often cheaper (1) as hard sea defences (like sea walls) do not need to be maintained (1) Trees have been planted (1) which can increase biodiversity (1) Managed retreat encourages the development of salt marsh (1) these ecosystems provide a habitat for birds (1) A bird reserve has been built (1) which can increase tourism/recreation/visitors (1) **Disadvantage:** Managed retreat can reduce availability of farmland (1) which can put pressure on food supplies (1) Managed retreat can upset landowners (farmers) (1) and require compensation to be paid increasing costs (1)	

	The village could be at increased flood risk (1) which can increase damage to buildings (1) The trees might block the (sea) view (1) leading to decrease in house prices (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
2(d)	**AO2 (3 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • People will know what to do in the event of a flood (1) meaning they go to emergency centres (1) which reduce the social impacts (1). • People keep important documents upstairs (1) to ensure they are not damaged by flood water (1) increasing the ability to make insurance claims (1) • People are aware of the dangerous currents in fast flowing flood water (1) this means they do not cross (1) reducing the risk of being swept away (1). • Architects use knowledge to improve building design (1) reducing the risk of infrastructure damage (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
2(e)	**AO3 (1 mark)** Award one mark for the following: • Sand dunes (1)	**(1)**

Question number	Answer	Mark
2(f)	**AO1 (2 mark)/AO2 (2 mark)** Award 1 mark (AO1) for the identification of a reason and a further mark for explanation (AO2) up to a maximum of two marks each. • Overfishing in coral reefs (1) disrupts the food chain of the ecosystem (1). • Tourists often touch the coral (1) which kills the coral (1).	

	• Pollution from agricultural runoff (1) can reduce water quality (affecting coral growth) (1). • Climate change (1) can lead to coral bleaching (1). Accept any other appropriate response.	**(4)**
Question number	Answer	**Mark**
2(g)	**AO3 (4 mark)/AO4 (4 mark)** **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 the significance of different types of human activity on the destruction of mangrove environments. Candidates will need to be able to identify the different causes of destruction and consider which human activity is most destructive for these environments. **AO3** • Mangroves are most commonly found in SE Asia, they are valuable nurseries for fish and have high biodiversity. • They trap sediment and help to create new land. • Mangroves help reduce the impact of tropical cyclones on human populations. • Destruction of mangroves is caused due to aquaculture (of fish and shrimps) to provide a source of food for people. • Destruction of mangroves is caused by land reclamation to build hotels and amenities for tourists. • Destruction of mangroves is caused by agriculture as they add herbicides to increase crop yields. • Destruction of mangroves is caused by the demand for wood to building and as a source of fuel. • Not all destruction is caused by humans as erosion is a contributing factor caused by increasing severity of tropical cyclones and rising sea levels. • Mangroves are being protected in some areas as they can be an effective flood defence. **AO4** • In Vietnam the biggest cause of mangrove deforestation is for urban development. • In Myanmar the biggest cause for mangrove deforestation is rice farming. • In Indonesia the biggest cause for mangrove	

	deforestation is aquaculture. • Indonesia has a high percentage of mangrove regrowth. • It is clear that most mangrove deforestation is caused by human activity rather than erosion.	
		(8)

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)** C Answer cannot be A (feature of a volcano), B (feature of a volcano), D (feature of a tropical storm)	**(1)**

Question number	Answer	Mark
3(b)(i)	**AO1 (1 mark)** B Answer cannot be A (definition of eye wall), C (definition of air pressure), D (definition of eye).	**(1)**

Question number	Answer	Mark
3(b)(ii)	**AO1 (1 mark)** Award one mark for any of the following: • Deaths (1) • Injury (1) • Damaged buildings (1) • Closed airports (1) • Choking from ash/gas (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
3(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark (AO1) for initial point and a further mark for development (AO2) up to a maximum of two marks. • Risk assessments can determine the probability and scale of an event occurring (1) which can encourage governments to invest in earthquake proof buildings (1). • Risk assessments can identify population at most risk (1) which can ensure response plans take account of most vulnerable groups (e.g. elderly/young) (1) which reduces risk of injury/death (1). • Risk assessments determine location of areas most at risk from tsunami wave (1) which show local governments where to build flood protection (1) to reduce social/economic impacts (1).	

	Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
3(c)	**AO2 (3 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • The Richter scale (1) measures the magnitude of an earthquake (1) on a logarithmic scale (1). • The Richter scale (1) measures the amount of energy released by the earthquake (1) using a seismograph (1). • The Mercalli scale (1) looks at the impacts of an earthquake (1) on a increasing scale from 1-12 (1). • The Moment Magnitude Scale (1) measures the energy released by an earthquake (1) based on the amount of rock movement along the fault (1). • Seismometers (1) measure the energy from the earthquake (1) when a weight moves due to vibrations (1) Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
3(d)	**AO2 (2 mark)/AO3 (2 mark)** Award 1 mark (AO3) for the identification of a characteristic of a tropical cyclone and a further mark for explanation (AO2) up to a maximum of two marks each. • Areas of warm ocean/water (1) cause air to rise/areas of low pressure (1). • There are thunderstorms (1) because the clouds are tall in height (1). • There is rainfall (1) because of thunderstorms being present (1). • The eye is calm (1) because the winds are deflected by Coriolis force (1). • The eye wall is most violent (1) because of the strong winds created (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
3(e)	**AO3 (1 mark)** Award one mark for the following: • Crater (1)	**(1)**

Question number	Answer	Mark
3(f)	**AO1 (2 mark)/AO2 (2 mark)** Award 1 mark (AO1) for the identification of a physical and social factor and a further mark for explanation (AO2) up to a maximum of two marks each. **Physical:** • Being an area of low-lying land (1) makes the likelihood of flooding (from storm surges) increase (1) • Being located between the tropics (1) increases vulnerability as the sea is warm enough for tropical cyclones to form (1) • Being located on the coastline (1) as this is where cyclones will make landfall and be at their strongest (1) **Social:** • Having a population with lots of very elderly people (1) increases vulnerability as they need help to evacuate (1) • Having a very young population (1) can increase vulnerability as they need help to evacuate (1). • Having a poorly educated population (1) means they will not know what to do/where to go when a cyclone hits (1). • Not planning for evacuation (1) can increase the risk of injury/death (1) Accept any other appropriate response.	**(4)**
Question number	Answer	**Mark**
3(g)	**AO3 (4 mark)/AO4 (4 mark)** **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 the significance of different plate margins in causing hazards. Candidates will need to be able to identify the different scale of hazards caused at different plate margins and consider the most dangerous plate margin to live near. **AO3** • Volcanic eruptions at divergent plate margins are often low explosivity, with mainly lava eruptions. The lava is often runny and flows quickly. However, these shield volcano eruptions are often more frequent. • Volcanic eruptions at convergent plate margins are often more explosive. Where composite volcanoes form resulting in eruptions which include pyroclastic flows, lahars, lava, volcanic bombs. These eruptions are often less frequent. • Earthquakes at convergent plate margins are often quite high magnitude due to 'stuck/slip' faults. These lead of high amounts of pressure building between earthquakes making the magnitude bigger when the fault ruptures. • Earthquakes at transform plate margins are often high magnitude due to the 'stuck/slip' nature of the faults. • Earthquakes at divergent plate margins are often low magnitude resulting in little/no damage to human property/life. **AO4** • Iceland is located on a divergent plate margin resulting in low explosivity eruption. • Nepal is located on a convergent plate margin between two continental plates and experienced a 7.8 magnitude earthquake. • The Tonga eruption was fairly explosive (VEI 5) due to it being at a convergent plate margin. • The New Zealand earthquake had a magnitude of 7.8 as its located on both transform and convergent plate margins.	
		(8)

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 mark)** Award 1 mark for identifying a relevant data presentation type and a further mark for development up to a maximum of two marks. • Used pie charts (1) to show sediment shape data (1) • Used bar graphs (1) to show sediment size data (1) • Used land use map (1) to show different geology (1) Accept any other acceptable response.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • Using data from other investigations carried out along the same river could be unreliable (1) as we do not know how accurately the previous groups collected the data (1) making comparisons to own data inaccurate (1). • Using topographic maps of the drainage basin could be difficult to identify the exact location of the study sites (1) meaning the incorrect geology could be identified (1) making comparing data sets unreliable (1). Accept any other acceptable response.	**(3)**

Question number	Answer	Mark
4(c)	**AO3 (2 marks) / AO4 (2 marks)** Award 1 mark for the identification of an improvement and a further mark for explanation up to a maximum of two marks each. • Use a calliper (1) to measure the size of pebbles to avoid errors (1). • Ensure the tape measure is pulled straight (1) when measuring width of channel to ensure length recorded is correct (1). • Ensure the same person uses the clinometer (1) at every site to reduce errors in angle recorded (1). • Ensure a group of students agree the shape of pebbles (1) as judgement is subjective (1). • Take more measurements (1) to reduce the influence of anomalies (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
4(d)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • The river gradient decreased (1) as vertical erosion decreases (1) and lateral erosion increases in the middle/lower course (1). • The pebble shape became more rounded (1) as a result of attrition (1) as you travel downstream (1). • The velocity increased downstream (1) because more tributaries join the main channel (1) increasing the volume of water (1). • Channel width increases (1) as lateral erosion increases (1) at sites further downstream (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(e)	**AO3 (4 mark)/AO4 (4 mark)** **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 evaluating the reliability of the students conclusions. Candidates will need to be able to identify the limitations in the methods and conclusion reached in the investigation and decide how this affects the validity of the conclusion reached. **AO3** • The Bradshaw model suggests that discharge and velocity in a river increase downstream. • Random sampling may not ensure that there is enough variation in sites chosen to fully represent changes along a rivers long profile. • The data was collected during spring which would mean unreliable results as discharge and velocity change during the year. • Students did not repeat measurements meaning averages could not be calculated which can increase the influence of anomalies on their results. • Students should have visited the river at different	

	times of year to get more accurate data about width and velocity. • The students should have collected data on depth of river. • The students conclusion does not fit the Bradshaw model suggesting there is an error making their conclusion less reliable. **AO4** • The three sites along the river are all located close together (likely all in the middle course). • Site 2 has the widest width and highest velocity. • Site 1 has the narrowest width and lowest velocity. • Site 3 is closest to the lower course (lowlands) but has a smaller width and lower velocity.	
		(8)

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 mark)** Award 1 mark for identifying a relevant data presentation type and a further mark for development up to a maximum of two marks. • Used pie charts (1) to show sediment shape data (1) • Used bar graphs (1) to show sediment size data (1) • Used land use map (1) to show different geology (1) Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
5(b)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • Using data from other investigations carried out along the same stretch of coastline could be unreliable (1) as we do not know how accurately the previous groups collected the data (1) making comparisons to own data inaccurate (1). • Using geology maps of the coastline could be difficult to identify the exact location of the study sites (1) meaning the incorrect geology could be identified (1) making comparing data sets unreliable (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
5(c)	**AO3 (2 marks) / AO4 (2 marks)** Award 1 mark for the identification of an improvement and a further mark for explanation up to a maximum of two marks each. • Use a calliper (1) to measure the size of pebbles to avoid errors (1). • Ensure the tape measure is pulled straight (1) when measuring the distance between ranging polls to ensure distance recorded is correct (1). • Ensure the same person uses the clinometer (1) at every site to reduce errors in angle recorded (1). • Ensure a group of students agree the shape of pebbles (1) as judgement is subjective (1).	

	• Take more measurements (1) to reduce the influence of anomalies (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
5(d)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • The pebbles were more rounded at one end of the beach (1) as they were more exposed to attrition (1) when being carried along the coast by longshore drift (1) • The largest sediment was nearest the cliff (1) because it falls from the cliff (1) and is not exposed to erosion during high tide (1) • The sediment at one end of the beach was largest (1) getting smaller due to erosion (1) as sediment has been transported along the beach by longshore drift (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
5(e)	**AO3 (4 mark)/AO4 (4 mark)** **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 evaluating the reliability of the students conclusions. Candidates will need to be able to identify the limitations in the methods and conclusion reached in the investigation and decide how this affects the validity of the conclusion reached. **AO3** • Pebble size gets smaller from one end of the beach to the other in the direction of longshore drift due to attrition. • Pebble shape should get rounder from one end of the beach to the other in the direction of longshore drift due to increased time spent in the water leading to	

	more attrition. • Random sampling may not ensure that there is enough variation in sites chosen to fully represent changes along the stretch of coastline. • The data was collected during spring which could impact reliability as the beach may have experienced beach replenishment before the tourist season. • Different students could have categorised the shape of the sediment which could have lead to variation in what was classed as angular. • There is no detail about how many pebbles were measured at each site or how they were chosen. • Students should have visited the beach at different times of year as winter storms and beach replenishment can influence sediment data. • The students conclusion does not show the expected relationship between processes and sediment size/shape. **AO4** • The three sites along the Italian coastline are all very close to one end of the sediment cell. • Site 2 has the smallest sediment size and 80% of pebbles are angular but is not closest to the start of the sediment cell. • Site 1 has the joint biggest sediment size and 70% of pebbles as angular. • Site 3 has the same sediment size as site 1 but this site has the same percentage of angular pebbles (70%) as site 1.	
		(8)

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 mark)** Award 1 mark for identifying a relevant data presentation type and a further mark for development up to a maximum of two marks. • Used pie charts (1) to show results of closed questions in questionnaire (1) • Annotated photographs (1) of before and after the cyclone (1) • Used land use map (1) to show human and physical areas (1) Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
6(b)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • Using data from other investigations carried during previous storms could be unreliable (1) as we do not know how accurately the previous groups collected the data (1) making comparisons to own data inaccurate (1). • Using newspaper articles can be less accurate as they often report an individual's perspective (1) which do not give the full details of the event making comparing data unreliable (1).	

	Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
6(c)	**AO3 (2 marks) / AO4 (2 marks)** Award 1 mark for the identification of an improvement and a further mark for explanation up to a maximum of two marks each. • Ask open questions (1) to ensure all opinions are fully represented (1) • Ensure weather recording equipment is calibrated (1) to ensure accurate data is recorded (1) • Ensure data in weather diary is recorded daily (1) to ensure only one days rainfall is recorded (1) • Place the rain gauge in an open area (1) to avoid a false reading (1) • Take more measurements (1) to reduce the influence of anomalies (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
6(d)	**AO3 (2 marks) / AO4 (1 mark)** Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • As air pressure decreased there was more rainfall (1) because air is rising (1) leading to evaporation and cloud formation (1) • Local people living in areas with better quality housing (1) have a more positive hazard perception (1) because the buildings are less likely to be damaged (1). • Sites closest to the coast had higher rainfall levels (1) than sites more inland because of evaporation (1) as air moves over the ocean leading to more rainfall (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
6(e)	**AO3 (4 mark)/AO4 (4 mark)** **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 evaluating the reliability of the students conclusions. Candidates will need to be able to identify the limitations in the methods and conclusion reached in the investigation and decide how this affects the validity of the conclusion reached. **AO3** • The risk mapping suggests that areas that have higher vulnerability will experience the worst weather conditions. • Random sampling may not ensure that there is enough variation in sites chosen to fully represent differing levels of risk in areas at risk of tropical cyclones. • The data was collected during March which is outside the tropical cyclone season for this part of the world meaning weather is often less extreme. • Students did not repeat measurements meaning averages could not be calculated which can increase the influence of anomalies on their results. • Students should have ensured they collected data before and after an extreme weather event. • The students conclusion does fit the expected relationship between air pressure and rainfall. **AO4** • The three sites are all located on the east coast in central Vietnam. • There are no areas away from the coast investigated. • Site 2 has the highest amount of rainfall and the lowest air pressure. • Site 1 and 3 have the same amount of rainfall. • Site 1 and 3 have the same air pressure.	
		(8)

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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