GradeMax



Mark Scheme (Results)

Summer 2018

Pearson Edexcel International Advanced Subsidiary

Geography (WGE02)

Unit 2: Geographical Investigations

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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.

Placing a mark within a level mark band

- The instructions below tell you how to reward responses within a level. Follow these unless there is an instruction given within a level. However, where a level has specific guidance about how to place an answer within a level, **always** follow that guidance.

- **2 mark bands**
  Start with the presumption that the mark will be the higher of the two.
  An answer which is poorly supported gets the lower mark.

- **3 mark bands**
  Start with a presumption that the mark will be the middle of the three.
  An answer which is poorly supported gets the lower mark.
  An answer which is well supported gets the higher mark.

- **4 mark bands**
  Start with a presumption that the mark will be the upper middle mark of the four.
  An answer which is poorly supported gets a lower mark.
  An answer which is well supported and shows depth or breadth of coverage gets the higher mark.

- Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

  i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear

  ii) select and use a form and style of writing appropriate to purpose and to complex subject matter

  iii) organise information clearly and coherently, using specialist vocabulary when appropriate.

Question Number	Answer	Reject	Mark
1(a)(i)	**AO2 (2 marks)** A = Sea wall, revetment, recurved wall. B = Rip rap, riprap, rip-rap, rock armour. NB: Answers must link correctly to A and B specifically. Mark answer correct even if it follows an incorrect one on the same line.	A = "gabions" B = "rocks" "rubble" "boulders"	**2**

Question Number	Answer	Mark
1(a)(ii)	**AO1 (2 marks)** Award **1** mark for explaining a coastal management decision and a further **1** expansion mark for explaining how that may lead to a conflict / explaining conflict between two or more groups. • A policy of no protection (e.g. managed retreat) because of low land value (1) could upset local land owners and / or householders in locations at risk (1). • A policy of soft engineering may be seen as not offering sufficient protection in comparison with hard engineering (1) to some players / people with high value property. (1) • Environmental groups may see hard engineering approaches as unsustainable (1) and potentially damaging or degrading the local coastal ecosystem (1). Accept other valid explanations.	**2**

Question Number	Indicative content
1(b)	**AO1 (6 marks) AO2 (2 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: **AO1** • Bedrock hardness / resistance is a control over recession rates, harder rocks have greater resistance to both erosion and weathering processes. • Bedrock structure and jointing: highly fractured rock is less resistant to erosion; faults provide a weakness increasing recession rates; concordant versus discordant structure affecting rates of erosion. • Other factors are relevant such as coastal management options, e.g. hold-the-line vs managed retreat will directly control local coastal recession rates.

	• The degree of coastal exposure, e.g. to wind, as well as aspect, fetch and wave type. • Sea level change (long and short term) can influence coastal recession by altering wave and tidal action. • Nature of the coast, e.g. balance of high energy (e.g. beaches) to low energy (e.g. salt-marshes) will affect coastal recession and relief. **AO2** • The density and direction of rock jointing is a profound control on both weathering and erosion rates. • The balance of erosion to subaerial processes will be controlled by a complex combination of factors such as land-use and climate as well as geology, wave type etc. In some locations, these controls will be very significant. • For most coastlines, waves are the main source of energy for geomorphic processes so might be seen as the most significant factor. • Rates of recession will vary significantly in time and space, even on a short stretch of coastline where rock types and structure can vary over short distances. • Other factors, e.g. choice of coastal management might be significant for some coastline and areas. NB Answers only considering lithology or structure are likely to be maximum Level 2.	
Level	Mark	Descriptor
Level 0	0	No acceptable response.
Level 1	1–3	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate. (AO1) • Understanding addresses a narrow range of geographical ideas. (AO1) • Understanding of geographical ideas lacks detail. (AO1) • Applies knowledge and understanding to geographical information/ideas, with limited logical connections/relationships. (AO2)
Level 2	4-6	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Understanding addresses a range of geographical ideas. (AO1) • Understanding of geographical ideas is not fully detailed and/or developed. (AO1) • Applies knowledge and understanding to geographical information/ideas logically to find some relevant connections/relationships. (AO2)
Level 3	7-8	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Understanding addresses a broad range of geographical ideas. (AO1)

		• Understanding of the geographical ideas is detailed and fully developed. (AO1) • Applies knowledge and understanding to geographical information/ideas logically to find fully relevant connections/relationships. (AO2)

Question Number	Answer	Mark
2(a)(i)	**AO2 (2 marks)** Award **1** mark for each trend i.e. change over time. Maximum **2** marks. • Overall an increase in the house price index 1970 – 2015 for both countries (1). • UK has the steeper upward trend overall, reaching 500 in 2015 (1). • Canada has seen the slower / more gradual rate of index increase (1). • All house prices changes show marked fluctuations e.g. 2007/8 and 2015 (1). • Some evidence of cycles / peaks / spikes every 15-20 years for UK (1). Accept other overall trends in the data. Reject single data points i.e. no change over time. Data not required.	**2**

Question Number	Answer	Mark
2(a)(ii)	**AO1 (2 marks)** Award **1** mark for explaining a strategy / example and a further expansion mark that explains how ecological footprints are reduced, up to a maximum of **2** marks. • Cities e.g. Masdar, Abu Dhabi, are planned to operate on renewable electricity / energy which means that it will try to be carbon-zero (1) with lower pollution / carbon emissions from energy consumption (1). • City plans e.g. Tainjin, China have an emphasis on green transport, e.g. walking and bicycles (1) this has reduced diesel / petrol energy consumption from transport (1). • Large expanses of protected greenspace / parks (1) which sequester carbon and reduce per capita CO2 emissions (1). Credit other valid examples and ideas, either planned or already developed. Note: named eco-city not required for the marks.	**2**

<table>
<tr><th>Question Number</th><th colspan="2">Indicative content</th></tr>
<tr><td>2(b)</td><td colspan="2">AO1 (6 marks) AO2 (2 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:
AO1
• Large-scale urban regeneration infrastructure projects can be developed for different purposes and have a range of different design briefs.
• Example of large-scale infrastructure includes sporting events, expos and tourism development as tools for regeneration.
• Large-scale projects are often used as a catalyst for additional development and improvement. Often they are large cost and often part funded by the state, which carries a risk in the shorter and longer term.
• Sustainability may be an important aspect of some large-scale projects. It includes social, economic, political as well as environmental considerations, but there is much overlap between the ideas so often they cannot be considered as discrete.
• Urban regeneration can also be achieved at a smaller scale, using community based and localised schemes.
AO2
• Infrastructure projects are often focused around economic improvements, rather than environmental or social returns since some schemes are privately funded and shareholders want a return. Therefore, success is mixed depending on who is considering the measure.
• Criteria for ‘success’ include jobs, new housing, environmental improvements, improvements in services – but these may benefit some people more than others (newcomers versus existing residents).
• Regeneration through infrastructure may not benefit all individuals and groups within and area, so the “success” aspect can be met with mixed response depending on stakeholders and individuals.
• Smaller-scale regeneration projects focus on improving communities (housing, education and skills, employment opportunities) and increasing local representation. Such projects with more of a social focus are often significant tools in urban improvement. They may be more successful in some instances.</td></tr>
<tr><td>Level</td><td>Mark</td><td>Descriptor</td></tr>
<tr><td>Level 0</td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate. (AO1)
• Understanding addresses a narrow range of geographical ideas. (AO1)
• Understanding of geographical ideas lacks detail. (AO1)</td></tr>
</table>

		• Applies knowledge and understanding to geographical information/ideas, with limited logical connections/relationships. (AO2)
Level 2	4-6	Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Understanding addresses a range of geographical ideas. (AO1) • Understanding of geographical ideas is not fully detailed and/or developed. (AO1) • Applies knowledge and understanding to geographical information/ideas logically to find some relevant connections/relationships. (AO2)
Level 3	7-8	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Understanding addresses a broad range of geographical ideas. (AO1) • Understanding of the geographical ideas is detailed and fully developed. (AO1) • Applies knowledge and understanding to geographical information/ideas logically to find fully relevant connections/relationships. (AO2)

Question Number	Answer	Mark
3(a)	**AO3 (4 marks)** Award **1** mark for identifying a how the question was developed and a further expansion marks up to a maximum of **4** marks. Nature of question, title or hypothesis will vary depending on the location as well as the context of the investigation. • Identification of a local change that has taken place (1) and designing an investigation to understand causes / threats / impacts (1). • Use of a model e.g. bid rent model / plant succession (1) used as a basis for comparing a real world situation to theory (1). • Use of secondary data sources to identify issues / change (1) which could be the basis for an investigation (1). • Literature surveys reviewed (1) to understand more about a location and the issues to be investigated (1) • Use of maps / satellite images showing the proposed study area (1) and to identify specific sampling sites (1) • Use of forums/social media identifying local problems / conflicts (1) that could be investigated further / used as a basis for pilot studies (1) Note the question / hypothesis is just to provide a context for the investigation and the subsequent parts that follow. There is no separate credit for this.	**4**

Question Number	Answer	Mark
3(b)	**AO3 (3 marks)** Award **1** mark for explanation of ICT linked to analysis and a further expansion mark up to a maximum of **2** marks. Nature of the ICT and usage / analysis will vary depending on the location as well as the context of the investigation. • GIS was used to generate a large-scale city map, used to locate possible sites (1) and this helped determine the sampling strategy allowing for reliable data collection and subsequent analysis (1). • A historical map of the coast (1930's) was found on an internet archive site and allowed us to see the former position of the coastline (1). This helped us analyse coast recession and coastal erosion risk over the last 100 years (1). • ArcGIS Online was used to determine the travel times in a city. (1) This helped us analyse how congestion changes at different times of the day. (1). • A spreadsheet was used to filter and then sort the fieldwork data (1). This helped us begin the process of analysis and remove outliers before further processing of the data (1). • Use of Excel, or similar, to produce graphs and charts (1) to begin the process of comparison and analysis (1) Credit other acceptable explanations.	**2**

Question number	**Answer**
3(c)	**AO3 (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** Content depends on students' choice of research question. Secondary data / sources include the following ideas: • Used to find out more about the population / people of an area, e.g. local census statistics, supporting primary data findings. • Secondary information was used in determining the historical context of the area, providing comparative context • Secondary data / sources was used to contextualise and challenge primary fieldwork data. • Secondary data / sources can be used to give baseline data, e.g. to work out rates of coastal recession using oral histories. • Views of people on change – Newspapers, magazines – contrasted with primary data collection. • Photographs – changing scene, compared to own photos. • May explain that secondary data led to more reliable / more valid conclusion (or challenged primary data conclusions).

	Nature of responses will be heavily dependent on the context of the fieldwork and the environment in which it was undertaken. However, examiners should reward for detailed clear and specific data and information which are supported with depth and detail in terms of factual accuracy and realism linked to conclusions. **NB:** Expect a strong link to conclusions for 6 marks.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–2**	• Limited understanding of the relationships between geographical questions and the background information, geographical context and research question (AO3) • Uses a limited range of fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Limited evidence of an ability to draw conclusions and the evaluation is simplistic, limited to one stage in the route to enquiry. (A03)
Level 2	**3–4**	• Some understanding of the relationship between the background information, geographical context and research question (AO3) • Uses some fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Some evidence of an ability to draw conclusions and the evaluation is relevant, but restricted to one or two stages in the route to enquiry. (A03)
Level 3	**5–6**	• A full understanding of the relationship between the background information, geographical context and research question (AO3) • Evaluates fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Clear evidence of an ability to draw conclusions and the evaluation is full, across a number of stages in the route to enquiry. (A03)

Question number	Answer
3(d)	**AO3 (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. **Indicative content guidance** Content depends on students' choice of research question. Design and methodology could include some the following: • Design includes elements of sampling and frequency for different fieldwork methods. • Locational considerations, especially precise details of sites, or transects and sampling locations. • Design may also include temporal decision-making, e.g. when it is safe or appropriate to collect data and information which is likely to be most accurate and or reliable. • Methods may consider the balance of primary or secondary data and information, as well as reflection on quantitative and qualitative approaches. • Methods could include the design of specific methods e.g. questionnaires, interviews, EQS etc and comments on ease of analysis, reduction in subjectivity due to good design. • 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. Note: the focus for this particular question means that the bullets 1 + 2 in the Levels descriptors **below** are most relevant to the desired response.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Limited understanding of the relationships between geographical questions and the background information, geographical context and research question (AO3) • Uses a limited range of fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Limited interpretation, analysis based on the data / information collected. (AO3) • Limited evidence of an ability to draw conclusions and the evaluation is simplistic, limited to one stage in the route to enquiry. (A03)
Level 2	**5–8**	• Some understanding of the relationship between the background information, geographical context and research question (AO3)

Level	Mark	Descriptor
		• Uses some fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Interpretation and analysis based on the data / information collected form part of the response(AO3) • Some evidence of an ability to draw conclusions and the evaluation is relevant, but restricted to one or two stages in the route to enquiry. (A03)
Level 3	**9–12**	• A full understanding of the relationship between the background information, geographical context and research question (AO3) • Evaluates fieldwork research skills and techniques to obtain information that may link to, but not support, the investigation of the research question. (AO3) • Critically considers the role of interpretation, analysis based on the data / information collected. (AO3) • Clear evidence of an ability to draw conclusions and the evaluation is full, across a number of stages in the route to enquiry. (A03)

Question Number	Answer	Mark
4(a)(i)	**AO3 (1 mark)** Award **1** mark for each idea. Maximum **1** mark. • shows a walkway which could be slippery, especially after rain (1). • have plants and animals which sting, bite, give skin reactions, thorn injuries (1). • shows photos of plants which can cut legs, especially if students are wearing shorts (1). • unstable dunes – potential for breaks and sprains (1). • appears to be a hot climate (Spain) which presents a risk of heat stroke, dehydration, sun-burn during summer especially (1). • Large / uninhabited area so getting lost (1) Accept other possibilities if linked to Figure 3a.	**1**

Question Number	Indicative content	Mark
4(a)(ii)	**AO3 (3 marks)** Award **1** mark for explanation of risk management linked to linked to the resource and further expansion marks up to a maximum of **3** marks. • Students should wear trousers (or similar) minimising the risk from cuts to legs (1) caused by coarse grasses in the picture (1) and should keep legs covered throughout the time in the dunes (1). • GIS might show areas of steep dunes where falls could occur (1) so students can be told to avoid these areas	**3**

	when working (1) and use less steep pathways to access the dune (1). • Sun-screen lotion can be applied to skin at regular intervals therefore reducing the risk of sun-burn (1) in exposed coastal locations (1) where there is limited sun / shade protection. • Students advised not to touch any unknown animals which may bite (1) reduce the risk of infection or other harmful effect (1) which may lead to the need for hospital treatment/ carry first aid at all times. (1). Credit other valid ideas.	

Question Number	Answer	Mark
4(b)(i)	**AO3 (2 marks)** 1 mark for correct addition / total • Total = 359 (1) • OR shows addition of numbers calculation (1) 1 mark for correct answer (mean) • Mean = 35.9 or 36 (1)	**2**

Question Number	Answer	Mark
4(b)(ii)	**AO3 (2 marks)** Award **1** mark for explanation of a reason and a further expansion mark up to a maximum of **2** marks. • A large number of sites means that the reliability of the fieldwork data can be judged (1) as the consistency in the results can be measured / tested statistically (1) / reduces impact of anomalous results (1). • There were a large number of students in the fieldwork group so it was quick to collect a large amount of data (1) over a wide spatial area (1). • Some statistical tests require a large sample size / larger sample increases reliability (1) such as Chi-squared / Spearman (1). • There was thought to be considerable variation in the sediment sizes so 10 sites would identify the variation (1) and allow analysis to find out more about the accuracy of the sample / accuracy of the average sediment size (1).	**2**

Question Number	Indicative content	Mark
4(b)(iii)	**AO3 (4 marks)** Award **1** mark for explanation of a graphical technique and a further expansion mark up to a maximum of **2** marks. Award **1** mark for explanation of a cartographic technique and a further expansion mark up to a maximum of **2** marks. **Graphical** • They could use a combination of line graphs and bar charts to allow several variables to be plotted on one graph (1) which would allow comparison between changes in variables (1). • They could use two separate graphs, e.g. line graph and a bar chart which are stacked on top of each other, using the same horizontal X-axis (distance) (1) which would allow comparisons (1). NB graph could be pebble size + shape (scattergraph) or sediment characteristic versus site distance (e.g. bar chart) **Cartographic** • They could use located proportional circles / bar charts / symbols onto a large-scale base map with mini bars / other symbols for sediment roundness (1) which would allow the user to easily see changes in frequency of the data (1). • They could use GIS to present the data which would allow comparisons by colour coding the roundness (1) and using proportional circles for size, geo-spatially located (1). NB requires locational element + visual representation. Credit other valid ideas. NB for cartographic, there must be some mention of mapping / use of maps.	**4**

Question Number	Answer	Mark
5(a)(i)	**AO3 (1 mark)** Award **1** mark for each idea. Maximum **1** mark. • a very busy road which would be difficult for people to cross during fieldwork (1) • 4a shows fast-moving traffic which presents a risk (1) • the amount of traffic means there may be poor air quality from the vehicle pollution (1) • appears to be a hot climate which presents a risk of heat stroke, dehydration, sun-burn (1) • Photo taken from a height, so fall risk (1) Accept other valid ideas if linked to Figure 4a.	**1**

Question Number	Indicative content	Mark
5(a)(ii)	**AO3 (3 marks)**	**3**

	Award **1** mark for explanation of risk management linked to linked to the resource and further expansion marks up to a maximum of **3** marks. • Students could also use a pedestrian crossing in 4a so that this would be a safe location (1) at which a crossing can be made (1) and reduce the risk from traffic injury (1); wear hi-vis clothing to increase visibility to drivers (1); cross the road carefully (stop, look, listen) (1). • In this hot climate carrying a hat, water and or sun protection (1) would reduce risks of dehydration (1) as well as problems from sun-burn (1). • Carry out fieldwork in the cooler times of the day (1) which reduces the risk of heat stroke, dehydration (1) therefore making the fieldwork safer (1). Credit other valid ideas linked to Figure 4a.	

Question Number	Answer	Mark
5(b)(i)	**AO3 (2 marks)** 1 mark for correct addition / total • Total = 359 (1) • OR shows addition of numbers calculation (1) 1 mark for correct answer (mean) • Mean = 35.9 or 36 (1)	**2**

Question Number	Answer	Mark
5(b)(ii)	**AO3 (2 marks)** Award **1** mark for explanation of a reason and a further expansion mark up to a maximum of **2** marks. • A large number of sites means that the reliability of the fieldwork data can be judged (1) as the consistency in the results can be measured / tested statistically (1) / reduces impact of anomalous results (1). • There were a large number of students in the fieldwork group so it was quick to collect a large amount of data (1) over a wide spatial area (1). • Some statistical tests require a large sample size / larger sample increases reliability (1) such as Chi-squared / Spearman (1). • There was thought to be considerable variation in the number of SUVs so 10 sites would identify the variation (1) and allow analysis to find out more about the accuracy of the sample (1). Accept other valid ideas.	**2**

Question Number	Indicative content	Mark
5(b)(iii)	**AO3 (4 marks)** Award **1** mark for explanation of a graphical technique and a further expansion mark up to a maximum of **2** marks. Award **1** mark for explanation of a cartographic technique and a further expansion mark up to a maximum of **2** marks.	**4**

	Graphical • They could use a combination of line graphs and bar charts to allow several variables to be plotted on one graph (1) which would allow comparison between changes in variables (1). • They could use two separate graphs, e.g. line graph and a bar chart which are stacked on top of each other, using the same horizontal X-axis (distance) (1) which would allow comparisons (1). NB graph could be vehicles per minute + SUVs (scattergraph) or vehicle characteristic versus site distance (e.g. bar chart) **Cartographic** • They could use located proportional circle onto a large-scale base map with mini bars for sediment roundness (1) which would allow the user to easily see changes in frequency of the data (1). • They could use GIS to present the data which would allow comparisons by colour coding the vehicles / minute (1) and using proportional circles for number of SUV, geo-spatially located (1). NB requires locational element + visual representation. Credit other valid ideas.	