Unit 2 – Mark scheme

Question number	Answer	Mark
1(a)(i)	**AO2 (2 marks)** • A = stump (1) • B = headland or cliff (1) Do no not allow 'arch' for B.	**(2)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (2 marks)** Award **1** mark for identifying a physical process and a further **1** expansion mark to explain how that process has formed the rock arch. • Hydraulic action (1) is where air is trapped in joints and cracks of the headland and is then explosively released, weakening the cliff, causing erosion (1) • Abrasion (1) is where small fragments of rock and sand over time wear away hard rock surfaces acting much like sandpaper (1) • Sub-aerial weathering (1) is a linked process where rock is disintegrated in-situ by chemical or mechanical processes (1) Do not accept solution as the process is not valid in Figure 2.	**(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: • sustainable policies are those which encourage a softer and more long-term approach to coastal management • examples (low impact) include beach nourishment, beach profiling and dune stabilisation as well as various types of strategic retreat • sustainable policies accommodate, copy or work alongside natural systems and processes • policies can be both holistic and integrated • it is often management via an integrated coastal management plan, ICZM or similar, taking into account a large unit of coast, which is a systems-based approach. AO2: • perhaps the most important advantage of sustainable management is that it is designed to cope with future threats (increased storm events, rising sea levels) yet its implementation can lead to local conflict • schemes which might require flooding of sections of coast, or creating new coastal buffers are often the most controversial as there is intergenerational discord with the present generation losing out to future generations.

Level	Mark	Descriptor
	0	No rewardable material.
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, making 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, making 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, making relevant connections/relationships. (AO2)

Question number	Answer	Mark
2(a)(i)	**AO2 (2 marks)** Award **1** mark for each characteristic of the settlement in Area A. Maximum **2** marks. High density/tightly packed (1) • Low rise (1) • Unplanned/random pattern (1) • Poor quality (or similar) (1)	**(2)**

Question number	Answer	Mark
2(a)(ii)	**AO1 (2 marks)** Award **1** mark for identifying a socio-economic process/cause and a further expansion mark, up to a maximum of **2** marks each. • Inequality is caused by lack of access to services (e.g. education, employment etc.) (1) and in poorer parts of the world inequality can be very profound in terms of differences in housing stock (1) • Poverty linked to lack of access to sanitation can create environmental problems such as local pollution (air, water, sea) (1) as well as linked social problems in the form of lack of access to healthcare, high incidence of disease etc. (1) • Rapid rural-urban migration as people seek opportunity (1) causes overcrowding and a lack of affordable/planned housing stock (1) Accept any other processes linked to the image, e.g. globalisation.	**(2)**

Question number	Indicative content
2(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: • social problems are linked to pollution levels (NOx etc.), plus stress of journeys, congestion, slowness, cost, health etc. • problems will vary depending on context of the urban environment, i.e. large developing world city vs world city vs smaller city etc. • in some cities there are thresholds in pollution levels, e.g. safe limits set by governments and WHO etc. and these may be exceeded leading to problems • in many cities land is at a premium which puts increasing pressure on green spaces and interconnecting wildlife corridors • traffic infrastructure can 'constrict' wildlife populations and prevent them seeking out new territory • there is overlap into environmental problems in terms of pollution degrading the quality of the environment and reducing biodiversity and spaces for plants and animals • good public transport provision will normally reduce some problems. AO2: • as well as the level of management the level of the problems will be determined by the human geography of the urban area particularly the population structure as less resilient groups/communities, i.e. old, young, poor, etc. will have greater impacts on them • other key factors include the physical geography of the urban area as it may prevent pollution gases from dispersing; or the natural dust/particulates (e.g. Dubai) may extend the problems.

Level	Mark	Descriptor
	0	No rewardable material.
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, making 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, making 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, making relevant connections/relationships. (AO2)

Question number	Answer	Mark
3(a)	**AO3 (4 marks)** Award **1** mark for identifying a purpose and a further expansion mark up to a maximum of **2** marks each. The purpose of the investigation is really about an understanding of why the investigation was actually undertaken in the first place. It will be likely linked to: • help to frame geographical theory, concepts and possible issues (1) or to challenge or to compare in the light of findings (1) • it will also give a wider idea of understanding in relation to the nature of the topic (1) and therefore improve geographical knowledge about the topic/area of interest (1) • a better understanding the locality in greater depth (1), or at a time of day when, for example different processes may be occurring which may not usually be seen/observed or measured (1) • gives an improved understanding of the context and nature of the physical/human processes operating (1), which helps to boost prior knowledge. (1) Do not credit the methodology of what was actually done. Note; the 'research question is just to provide a context for the investigation and the subsequent parts that follow.	**(4)**

Question number	Answer	Mark
3(b)	**AO3 (2 marks)** Methods chosen will depend on the nature of the data, e.g. spatial, non-spatial, qualitative, quantitative, etc. Below is an example. Award **1** mark per relevant choice of method used to analyse fieldwork and a further expansion mark, up to a maximum of **2** marks. For example: • initial analysis included scatter graphs to visually explore the strength of relationship between pedestrian flow and rateable land values (1), this technique was chosen as it would allow us to see if a further test, e.g. Spearman's rank should also be used to calculate an RS value to test a hypothesis (1) • calculation of upper and lower quartiles from the beach sediment data (1), allowed us to look at the spread and clustering within the stone–length data. (1) Do not accept: it was easy to use, quick, best method, etc.	**(2)**

Question number	Indicative content
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 candidates' choice of research question. Results and conclusions should include the following: • the nature of initial research to inform the context of the enquiry as well as the identification of an appropriate topic to study through the route to enquiry • design of sampling framework: number of sites, spacing, sample sizes, sampling method, plus methodology: equipment, operator error etc. This impacts on both the range and quality of data and in turn has effects upon the nature of the results and the validity of conclusions • appropriate data analysis should be used as a tool(s) to interrogate the results and help take meaning from the data, including measures of validity and reliability. This can include primary and secondary data as well as quantitative and qualitative techniques • conclusions should be clearly explained and substantiated with appropriate links to the results presented and analysed. 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 location-specific findings which are supported with depth and detail in terms of factual accuracy and realism.

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. (AO3)

Level	Mark	Descriptor
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. (AO3)
Level 3	**5–6**	• A full understanding of the relationship between the background information, geographical context and research question. (AO3) • Uses and appropriate range of 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. (AO3)

<table>
<tr><th>Question number</th><th>Indicative content</th></tr>
<tr><td>3(d)</td><td>
This is an example of a route to enquiry:
<table>
<tr><td>1</td><td>Initial research and setting up the context for the investigation</td></tr>
<tr><td>2</td><td>Sampling framework and design</td></tr>
<tr><td>3</td><td>Data presentation – limitations of graphical types, cartographic techniques etc.</td></tr>
<tr><td>4</td><td>Data analysis – issues with the tools, applicability of (small) data set; temporal and spatial limitations</td></tr>
<tr><td>5</td><td>Conclusions – strength and security of what was found in relation to the aims</td></tr>
</table>
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 candidates' choice of research question. Evaluation should include the following:
• the nature of initial research to inform the context of the enquiry as well as the identification of an appropriate topic to study through the route to enquiry
• design of sampling framework: number of sites, spacing, sample sizes, sampling method, plus methodology: equipment, operator error etc. This impacts on both the range and quality of data and in turn has effects upon the accuracy of the results and the validity of conclusions
• the efficacy of data presentation aids aspects of interpretation and meaning in the results; poor selection of presentation methods can mislead or skew the message from the data/information
• appropriate data analysis should be used as a tool(s) to help take meaning from the data, including measures of validity and reliability. This can include quantitative and qualitative techniques
• conclusions should be clearly explained and substantiated with appropriate links to the results presented and analysed
• a full evaluation of the whole investigation should reference all stages of the route to enquiry and recognise that geographical meaning should be cautiously interpreted. Each stage can be a potential source of enquiry error, and that some stages/processes can have greater impact on the outcome than others.
</td></tr>
</table>

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Shows evidence that fieldwork investigation skills used may not have been fully appropriate or effective for the investigation of the geographical questions/issue. (AO3) • Considers the fieldwork investigation process/data/evidence, with limited relevant connections and/or judgements. (AO3) • Argument about the investigation is simplistic and/or generic.(AO3)
Level 2	**5–8**	• Shows evidence that fieldwork investigation skills used were largely appropriate and effective for the investigation of the geographical questions/issue. (AO3) • Critically considers the fieldwork investigation process/data/evidence in order to make some relevant connections and valid judgements. (AO3) • Argument about the investigation may have unbalanced consideration of factors, but is mostly coherent. (AO3)
Level 3	**9–12**	• Shows evidence that fieldwork investigation skills used were appropriate and effective for the investigation of the geographical questions/issue. (AO3) • Critically considers the fieldwork investigation process/data/evidence in order to make relevant connection and judgements that are supported by evidence. (AO3) • Argument about the investigation includes balanced consideration of factors and is fully developed and coherent. (AO3)

Question number	Answer	Mark
4(a)(i)	**AO3 (4 marks)** Award **1** mark per relevant piece of information from Figure 3a/3b and a further development mark of how this can help plan their investigation, up to **2** marks each. • Figure 3a shows how vegetation and other characteristics vary spatially, i.e. from sea to land (1), this might mean that they need to take a series of measurements across the dune in order to understand the spatial aspect (1) • Knowledge of ecology in Figure 3a (1) might give a focus for particular specialist recording equipment (1)/visit to a university department to help them plan (1) • Figure 3a might help them to understand that plants/biodiversity/soil etc can be influenced by other factors, e.g. micro-climate (1), so they would need to use equipment to measure these e.g. thermometer, anemometer etc (1)/use secondary local weather data (1) • Figure 3b might make them think that the model is inaccurate (1), so they might consider setting up a comparison experiment(s) in another similar coastal ecosystem (1)/get different secondary data for that area (1) • Figure 3b might make them think that seasonal variations may have an impact on species (1), which helps them to further understand patterns (1) e.g. seasonal variation caused by changing temperatures, rainfall etc.	**(4)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (3 marks)** Award **1** mark for identifying a problem associated with secondary data and a further **2** expansion marks, up to a maximum of **3** marks each. • Its only for a short amount of time (1), so therefore in might be unreliable (1) and there is no indication of if this data forms part of a 'usual' pattern for this time of year (as you can see if it is an anomaly) (1) • There if no information about how the data is collected (1), so this means there must be questions about who collected it (1) and the quality of their equipment/machines/sampling frequency/accuracy etc. (1) Accept any other problems associated with secondary data and associated justification/exemplification of points.	**(3)**

Question number	Answer	Mark
4(b)(i)	**AO3 (2 marks)** • axes (x) and height (approximately) correct (1) • proportions/divisions (approximately) correct based on the data (after calculation of missing entries in the columns) (1)	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO3 (3 marks)** Award **1** mark for identifying a reason why the data may be unreliable and a further **2** expansion marks, up to a maximum of **3** marks each. • It only has a limited number of categories for age (1), for example age does not go down less than 15 years (1), so people below this age range do not have their age recorded which can introduce bias (1) • It only has a limited number of categories for activity (1), so there may be activities that can't be recorded (1), so people doing something different do not have their activity recorded which can introduce bias (1) • The survey is only conducted on one day (1), so this may not be representative of visitors to the beach as a whole/small sample. (1) Without further data you couldn't comment on reliability or degree of bias (1) • No information about how respondents were selected in the questionnaire (1), or whether some were excluded from the sample/refused to answer (1), which will impact on the outcomes and introduce bias (1) Accept any other explanations if feasible based on the data in Figure 3c.	**(3)**

Question number	Answer	Mark
5(a)(i)	**AO3 (4 marks)** Award **1** mark per relevant piece of information from Figure 4a/4b and a further development mark of how this can help plan their investigation, up to **2** marks each. • Figure 4a shows how pollution varies temporally, i.e. over the course of a day (1), this might mean that they need to take a series of measurements over a 24hr period or similar in order to understand the temporal aspect (1) • Knowledge of different pollutants in Figure 4a (1) might give a focus for particular specialist recording equipment (1)/visit to a university department to help them plan (1) • Figure 4a might help them to understand that pollution levels can be influenced by other atmospheric/weather conditions (1), so they would need to use equipment to measure these as well, e.g. thermometer, anemometer etc (1)/use secondary local weather data (1) • Figure 4b might make them think that pollution levels can very spatially (1), so they might consider setting up a comparison experiment(s) in another part of town (1)/get different secondary data for that area (1) • Figure 4b might make them think that seasonal variations may have an impact on pollution levels (1), which helps them to further understand patterns (1) e.g. seasonal variation caused by amount of dust/local winds.	**(4)**

Question number	Answer	Mark
5(a)(ii)	**AO3 (3 marks)** Award **1** mark for identifying a problem associated with secondary data and a further **2** expansion marks, up to a maximum of **3** marks each. • Its only for a short amount of time (1), so therefore in might be unreliable (1) and there is no indication of if this data forms part of a 'usual' pattern for this time of year (as you can see if it is an anomaly) (1) • There if no information about how the data is collected (1), so this means there must be questions about who collected it (1) and the quality of their equipment/machines/sampling frequency/accuracy etc. (1) Accept any other problems associated with secondary data and associated justification/exemplification of points.	**(3)**

Question number	Answer	Mark
5(b)(i)	**AO3 (2 marks)** • axes (x) and height (approximately) correct (1) • proportions/divisions (approximately) correct based on the data (after calculation of missing entries in the columns) (1)	**(2)**

Question number	Answer	Mark
5(b)(ii)	**AO3 (3 marks)** Award **1** mark for identifying a reason why the data may be unreliable and a further **2** expansion marks, up to a maximum of **3** marks each. • It only has a limited number of categories for age (1), for example age does not go down less than 15 years (1), so people below this age range do not have their age recorded which can introduce bias (1) • It only has a limited number of categories for activity (1), so there may be activities that can't be recorded (1), so people doing something different do not have their activity recorded which can introduce bias (1) • The survey is only conducted from one place/over one day (1), so this may not be representative of visitors to the city as a whole/small sample. (1) Without further data you couldn't comment on reliability or degree of bias (1) • No information about how respondents were selected in the questionnaire (1), or whether some were excluded from the sample/refused to answer (1), which will impact on the outcomes and introduce bias (1) Accept any other explanations if feasible based on the data in Figure 4c.	**(3)**