AQA

AS
GEOGRAPHY
7036/2

Paper 2 Human geography and geography fieldwork investigation

Mark scheme

June 2023

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the typical performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

The notes for answers provide indicative content. Students' responses may take a different approach in relation to that which is typical or expected. It is important to stress that examiners must consider all a student's work and the extent to which this answered the question, irrespective of whether a response follows an expected structure. If in doubt the examiner should contact their team leader for advice and guidance.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Qu	Part	Marking guidance	Total marks

Section A

| 01 | 1 | **Which of the following statements describes a change to a place caused by an inward flow of money and investment?**

B This place was run-down in the 1980s but then wealthy people moved here and improved the old Victorian houses. | **1**
AO1 = 1 |

| 01 | 2 | **In which of the following do both pieces of data show the economic characteristics of a place using quantitative sources?**

D House price data from property websites and the Land Registry. \| Census data showing employment structure of the local population. | **1**
AO1 = 1 |

| 01 | 3 | **Outline how community or local groups play a role in creating place-meaning.**

Point marked

Award one mark for each relevant point with extra mark(s) for developed points (d). (1x3; 3x1 or 1x2+1) For example:

Notes for answers

• Community groups might take an active role in trying to portray a positive view or changing the perception of their place (1) to improve the local economy for example local musicians and businesses may promote a town through organising a music festival which attracts visitors to the area (1d) for example, the Knutsford Music Festival (1d)
• Community groups may promote a place as representing a particular way of living (1) e.g., eco-towns or sustainable communities (1d). For example, The Incredible Edible Todmorden community group has been integral in shaping place-meaning around sustainable local food growing (1d).
• Community groups may be involved in rebranding or regeneration projects (1) as they have 'insider' view and will be the people most affected by any proposed changes (1d). For example, residents' associations may contribute to local planning and place-making schemes (1d).

The notes for answers are not exhaustive. Credit any valid points. | **3**
AO1 = 3 |

01	4	**Analyse the data shown in Figure 1.**	**6** **AO3 = 6**
		AO3 – Analysis of quantitative data to show changes to population over time. Mark scheme **Level 2** (4–6 marks) **AO3** – Clear analysis of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence. **Level 1** (1–3 marks) **AO3** – Basic analysis or description of the data provided, making limited use of evidence in support. Basic or limited connection(s) between different aspects of the data and evidence. Notes for answers The question requires analysis of the quantitative data shown in the figure. • Overall, the population of London fell between 1939 and 1991, but it grew rapidly between 1991 and 2020. • The population of London fell by 1.7 million from a high of 8.5 million in 1939 to around 6.9 million in 1991. The fall was most pronounced in inner London where population reduced by almost a half in 50 years. • Population in Inner London started to fall earlier and by a greater amount than in Outer London where population initially grew and then stabilised at around 4.4 million from 1951-2001 • The 1930s was the last time the population of Inner London was larger than that of Outer London • London's population has grown by approximately 2.4 million since 1991 and hit a new high of around 9.2 million in 2020. Both Inner and Outer London have been growing steadily and there has been an increase in total population of 35% in 39 years. • The proportionate populations have remained at around 60% in Outer London and 40% in Inner London from 2001 to 2020. This is the complete reverse of the proportions for 1931. • Inner London's population of 3.7 million in 2020 remains well below the historic peak of approximately 4.9 million in 1931. 1951 was the last year when Inner London had a population the same as 2011. • Since 2001, the historic decline of inner London population has been reversed. • Inner London's population increased by approximately 500 000 between 2011 and 2020 to 3.7 million whilst Outer London increased by approximately 600 000 to 5.5 million. • Between 1991 and 2020 there was a similar increase in population for Inner London and outer London (1.2 million approximately). Credit any other valid approach.	

01	5	**Using Figure 2a, Figure 2b and your own knowledge, assess the extent to which the character of a place such as Ramsbottom may be influenced by its location.**	**9** **AO1 = 4** **AO2 = 5**
		AO1 – Knowledge and understanding of exogenous and endogenous factors that influence place character. **AO2** – Applies knowledge to the novel situation in Figures 2a and 2b to assess the extent to which the location of this place may influence place character. Mark scheme **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of factors contributing to the character of a place. **AO2** – Demonstrates detailed application of knowledge and understanding to the novel situation and the extent to which location may contribute to place character. Analysis and evaluation are detailed and well supported with appropriate evidence. Synthesises information to fully support a conclusion about to what extent location contributes to the character of this place. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of factors contributing to the character of a place. **AO2** – Demonstrates clear application of knowledge and understanding to the novel situation and the extent to which location may contribute to place character. Analysis and evaluation are clear and well supported with appropriate evidence. Synthesises information to support a partial conclusion about to what extent location contributes to the character of this place. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of factors contributing to the character of a place. **AO2** – Demonstrates basic application of knowledge and understanding to the novel situation and the extent to which location may contribute to place character. Analysis and evaluation are basic and supported with limited evidence Notes for answers The question requires an assessment of to what extent location may influence the character of a place. Evidence from Figures 2a and 2b should be used to support the response. **AO1** • Knowledge and understanding of endogenous factors which contribute to place character. • Knowledge and understanding of exogenous factors which contribute to place character. • Knowledge and understanding of the impact of connections on the character of a place.	

- Knowledge and understanding of how past and present processes of development can be seen to influence the social and economic character of places.
- Knowledge and understanding of factors contributing to the character of place in a local or distant place studied.
- Knowledge and understanding of other processes of development that can influence the economic or demographic character of a place, for example, flows of people.

AO2
- An evaluation of to what extent location (where this place is) has influenced the character of the place in Figure 2.
- Figure 2a and 2b show that this place is located in a rural area which is likely to influence the economic character with a focus on primary industry (farming and quarrying shown in Figure 2a) and a low-rise / low-density built environment.
- Location in a valley surrounded by steep hills may have limited growth and also influenced land-use. Pastoral farming and forestry can be seen in Figure 2a and quarrying is a direct result of local geology. Some may suggest that local stone characterises the built environment.
- Figure 2b indicates a location that is easily accessible by the local motorway network. This may encourage flows of people (commuters), tourists or flows of business / industry and influence the social, demographic and economic characteristics of this place.
- The buildings in Figure 2a suggest an industrial past which could be linked to location. The small mill (factory) is now a brewery which may be evidence for changing economic place characteristics that are less linked to location and more a result of external forces.
- Figure 2b suggests that Ramsbottom has merged with other settlements, Greenmount to the south and Holcombe to the north. This growth and expansion of the built environment along the main roads may have contributed to a changing place character.
- A conclusion should make a judgement about to what extent location may have influenced the character of this and/or another place Some may argue that location is the key factor as it has influenced both past and present economic activity which in turn has influenced land use and the built environment. Some may argue that location in terms of accessibility to communications links is likely to have influenced growth of the built-environment and changes to demographic and economic characteristics. Others may argue that location may have little influence on place character and other factors such as topography or external forces may influence place character to a greater extent.

Credit any other valid evaluation.

01	6	**Assess the extent to which past connections have shaped a local place you have studied.**	**20** **AO1 = 10** **AO2 = 10**
		AO1 – Knowledge and understanding of how past connections can shape a place. Knowledge and understanding of a local place and the importance of past connections and other factors in shaping this place. **AO2** – Assessment of to what extent past connections have shaped the local place studied. Notes for answers This question makes connections between different parts of the specification content on Changing Places, specifically linking the way that past connections shape place and other factors that have shaped a local place studied. Responses should focus on evaluating the importance of past connections in shaping the local place relative to other factors. **AO1** • Knowledge and understanding of the concept of place. • Knowledge and understanding of how past and present connections, within and beyond localities, shape places and embed them in the regional, national, international and global scales. • Knowledge and understanding of endogenous and exogenous factors contributing to the character of a place. • Knowledge and understanding of continuity and change in the nature of places and our understanding of place. • Knowledge and understanding of the impact of relationships and connections on place. • Knowledge and understanding of how external agencies may make attempts to influence or create specific place-meanings. **AO2** • An evaluation of to what extent past connection have been important in shaping the local place studied. • The way in which a place was connected in the past may strongly influence its character today. For example, during the industrial revolution, industrial cities such as Manchester were globally connected through the trade of goods produced and raw materials that were imported. These connections helped to shape them as 'industrial' cities and despite deindustrialisation, this is still an important aspect of place character today. • Regeneration or re-imaging of places by external agencies often uses past connections in the shaping of present-day place. For example, Docklands redevelopment at Canary Wharf retained some of the heritage of past connections as a port and centre of international trade, for example converted warehouses and dock basins are an integral feature of this place today. • Present day global connections may also shape places today. For example, Canary Wharf is a centre for the global financial sector with a high number of global companies which contribute to character of this place through the demographic and economic characteristics, land use, build-environment and infrastructure.	

- Past connections may have helped to shape the cultural or social character of a place. For example, in the 20th century the UK experienced migration from Commonwealth countries and more recently as a result of connections with the EU. This has helped to shape the character of many places.
- Some places may not be shaped by past connections, for example, newly built settlements. Other places may be shaped more by their location or physical geography e.g., remote rural villages.
- A conclusion should make a judgement about the extent to which past connections has shaped the local place studied. The way in which a place has been connected in the past may strongly affect character in the present or a place may be shaped by a mix of past and present connections or other factors may be more important.
- Any view is acceptable, as long as it is supported with reasoned argument and illustrative examples and evidence.

Credit any other valid assessment.

Marking grid for Question 01.6

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes. • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Qu	Part	Marking guidance	Total marks

Section B

| 02 | 1 | **Suggest why it is good practice to evaluate sources of secondary data used in a geography fieldwork investigation.**

Point marked
Award one mark for a suggestion and one mark for development (d). (1x2 or 2x1). For example:

Notes for answers
• The data has been collected by someone else so the source needs to be checked to see how reliable and/or accurate it might be (1). For example, data collected by government sources such as ONS/IMD may be more reliable than some 'big data' which use 'crowd-sourced' data from social-media platforms (1d).
• Some qualitative sources may represent a particular 'view' of a place (1) and need to be analysed with this context in mind (1).
• It is important to look at sample size (1) or possible bias in the data (1) to ensure validity of use (1d).
• Some sources may be outdated (1) and need to be evaluated for their relevance or validity to the investigation (1d).

The Notes for answers are not exhaustive. Credit any valid points. | **2**
AO1 = 2 |

| 02 | 2 | **Suggest how Figure 3a, Figure 3b and Figure 3c could together be a useful planning tool for a fieldwork investigation.**

Point Marked
Award one mark for each suggestion of the usefulness of these maps for planning a fieldwork investigation. Allow an additional mark for a developed point (1d).
• These maps could be used to identify areas of the coastline where physical processes may be active, for example coastal erosion (1) and this could be useful to identify sites for investigation (1d).
• The maps show land and settlement has been lost to the sea over time and where this is most and least significant could inform choice of site (1) for a comparative investigation (1d).
• The maps could be used to identify sites for investigation where land use has changed (1), for example, areas of new housing (1d) or to identify suitable sites for investigation into changes to the local carbon or water cycle (1d).
• The maps indicate new patterns of land use, for example, the caravan park and changes to the built environment (1). This may help a student to plan surveys to investigate changing places or changes in economic structure of the area (1d). | **4**
AO3 = 4 |

12			

		• The maps would help to identify areas that have seen little change in land use where there has been continuity in place character (1). • The maps could be used to identify access routes or transect lines (1) or for assessing safety risks (1) when planning an investigation. Credit any other reasonable suggestions related to fieldwork in relation to the maps and the overlay.	

02	3	**Suggest how qualitative data collected from an interview can be analysed.** Point Marked Award one mark for any reasonable suggestion. Allow an additional mark for a developed point. (2x1 or 1x2) • The interview transcript can be annotated to identify and classify or categorise common themes or concepts (1). These can then be coded according to these themes / concepts (1d). • Codes may be formulated prior to data collection (1). • Qualitative data could be allocated quantitative values (1) • Responses to interviews could be categorised (1) and presented in bar graphs/pie charts or similar for comparative/visual analysis (1d) Credit other relevant suggestions.	**2** **AO3 = 2**

02	4	**To what extent did health and safety considerations influence your choice of site(s) for primary data collection?** **AO1** – Knowledge of the fieldwork enquiry that was carried out. Knowledge and understanding of health and safety considerations and any mitigation of risks. Knowledge and understanding of why sites for primary data collection were selected. **AO2** – Application of knowledge and understanding to assess the extent to which health and safety considerations influenced the choice of site (s) for primary data collection. Mark scheme **Level 2 (4–6 marks)** **AO1** – Clear knowledge and understanding of health and safety considerations and mitigation of risks. Clear knowledge and understanding of reasons why sites were selected for primary data collection. **AO2** – Clearly applies knowledge and understanding of health and safety considerations to assess how far it influenced site selection for primary data collection. Clear assessment of the link between health and safety considerations and site selection, supported with evidence from the enquiry.	**6** **AO1 = 2** **AO2 = 4**

Level 1 (1–3 marks)

AO1 – Basic knowledge and understanding of health and safety considerations. Basic knowledge and understanding of reasons why sites were selected for primary data collection**.**

AO2 – Basic application of knowledge and understanding of health and safety considerations to assess how far it influenced site selection for primary data collection. Partial assessment of the link between health and safety considerations and site selection, supported with evidence from the enquiry.

Notes for answers
There is some requirement for description of health and safety considerations and factors that influenced the selection of sites for primary data collection used in the fieldwork enquiry. However, the emphasis is on how far health and safety considerations influenced the selection of sites.

AO1
Knowledge and understanding of:
- the fieldwork enquiry carried out
- health and safety considerations and risk assessments
- factors that influenced site selection for primary data collection.

AO2
- Assessment of how health and safety considerations may have influenced the selection of sites for primary data collection. For example, risk assessments prior to data collection may have identified risks and led to the modification of sites.
- Physical geography investigations may have considered, for example, the dangers of water, dense vegetation, topography and terrain, safe access to sites, personal safety etc. and led to modification of sites chosen for primary data collection.
- Human geography investigation may have considered, for example, traffic density, air quality, personal safety etc and this may have led to modification of sites for primary data collection.
- For some fieldwork investigations, health and safety considerations may have had more influence on types of data collection rather than choice of site. For example, a student may have chosen to do postal questionnaires rather than one to one interviews. It may be that sites remained the same, but sampling points were modified to avoid high risk in specific places.
- Health and safety considerations may be seen as less influential over choice of sites than other factors. For example, the aim of the investigation, chosen sampling strategy, ethical issues, ease of access etc.
- An overall sense of the extent to which health and safety considerations had an influence on site selection for primary data collection.

Credit any other valid approach.

02	5	**'Thorough planning always leads to reliable data collection in the field.'**	**9** **AO1 = 3** **AO2 = 6**
		With reference to your own experience, to what extent do you agree with this statement?	
		AO1 – Knowledge and understanding of the planning of the fieldwork investigation and data collected. Knowledge and understanding of the review of the enquiry. **AO2** – Application of knowledge and understanding of planning stage of the investigation and how it affected the data collected. Makes a direct link between planning and reliability of data collected.	
		<u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Detailed knowledge and understanding of the planning stage of the investigation. Detailed knowledge and understanding of the review of data collected. **AO2** – Detailed application of knowledge and understanding of the planning to evaluate how far this led to reliable data being collected. Makes a direct link between planning and a review of data collection.	
		Level 2 (4–6 marks) **AO1 –** Clear knowledge and understanding of the planning stage of the investigation. Clear knowledge and understanding of the review of data collected. **AO2** – Clear application of knowledge and understanding of the planning to evaluate how far this led to reliable data being collected. Makes a clear link between planning and a review of data collection.	
		Level 1 (1–3 marks) **AO1 –** Basic knowledge and understanding of the planning stage of the investigation. Basic knowledge and understanding of the review of the data collected. **AO2** – Basic application of knowledge and understanding of the planning to evaluate how far this led to reliable data being collected. Makes a basic link between planning and a review of data collection.	
		<u>Notes for answers</u> There is some requirement for knowledge and understanding of the planning of the investigation, but the emphasis in this question is on applying knowledge and understanding of the planning to evaluate how far this had contributed to reliable data collection.	
		AO1 Knowledge and understanding of: • the different stages of the enquiry process • the planning and preparation stage of the investigation • the aim of the investigation • secondary sources of data used in the investigation • how planning informed data collection • other factors that may have affected primary data collection	

- the review of the enquiry.

AO2
- Application of knowledge and understanding to evaluate to what extent planning led to reliable data collection.
- Planning suitable sites may have ensured that a large enough sample of data was collected for it to be reliable. Planning the suitability of sites may also have helped to avoid bias in the data and that data collection could be repeated to improve reliability if necessary.
- Planning a sampling strategy would help to ensure reliable representation of the parent population. Planning would also help to ensure that the sampling strategy could be applied in the field and there would be access to sampling points.
- Planning the equipment for a fieldwork investigation would help to ensure that accurate data was collected in the field.
- Planning pilot surveys would help to ensure that survey tools would collect data as expected in relation to the hypothesis.
- Planning might include the use of secondary data that could be compared to any data collected and used as a 'check' for reliability of primary data.
- Planning was more or less useful for reliable data collection for a variety of reasons relating to their own investigation.
- Despite careful planning, data collection in the field may have been disrupted by human error, equipment failure, weather, footfall, health and safety issues and risk assessments etc.
- Data may have become more reliable as plans were altered in the field by adapting to difficult site conditions or other factors.
- The sampling strategy or equipment may have been more important for ensuring data reliability.

Credit any other valid approach.

| 03 | 1 | **Suggest why the student decided to collect data using a systematic sample.**

Point marked

• Taking samples at fixed intervals from the town centre is easy and simple way to test a hypothesis about change over distance (1).
• Systematic sampling can achieve good coverage of the study area (1) while providing a representative sample of data (1).
• Systematic sampling reduces bias (1) as the points are pre-determined.
• It is more straightforward to calculate sampling points using a map (1) and to execute data collection accurately (1d).
• The sample is spread evenly over the whole distance (1) and avoids the clustering of points that may occur with random sampling (1d).

Credit any other valid points. | **2**
AO3=2 |

| 03 | 2 | **Suggest how the student could present the data in Figure 6 to help show the relationship between distance from the town centre and the percentage of shops.**

Point marked
• The student could have plotted a scatter graph (1) by using distance on the x axis against the percentage of shops on the y axis (1d) in order to draw a line of best fit (1d) to determine if there is a positive or negative correlation (1d).
• The student could have over-lain percentage bars or proportional circles (1) onto the sketch transect (1d) to show change with distance from the town centre (1d).
• The student could draw a simple percentage bar graph for each sample point (1).
• The student could present the data as a line graph (1) to visually display the relationship between distance and the percentage of shops and identify general trends or anomalies (1d)
• The data could be presented as a kite diagram (1).

Credit any other valid points. | **2**
AO3 = 2 |

03	3	**Complete the calculation of R_S in Figure 7 to two decimal places and use Figure 8 to interpret these findings.**	**4** **AO3 = 2**

Point marked
1 mark for accurate completion of the table
1 mark for accurate R_s
2 marks for interpretation.

Sampling Point	Distance from town centre (m)	Rank of distance	Shops (%)	Rank of % shops	d	d^2
1	500	10	60	2	8	64
2	1000	9	45	3	6	36
3	1500	8	25	4	4	16
4	2000	7	10	7.5	-0.5	0.25
5	2500	6	5	**9**	**-3**	**9**
6	3000	5	20	5	0	0
7	3500	4	15	6	-2	4
8	4000	3	10	7.5	-4.5	20.25
9	4500	2	70	1	1	1
10	5000	1	0	10	-9	81

$\sum d^2 =$ **231.5**

$6 \times \sum d^2 =$ **1389**

$$R_s = 1 - \frac{6 \sum d^2}{n^3 - n}$$

$$= 1 - \frac{1389}{990}$$

$$= 1 - 1.40$$

$$R_s = -0.40$$

- Accurate completion of the row for sampling point 5 to d^2 (1)
- Accurate completion of R_s calculation (1)
- The R_s co-efficient is not statistically significant either at 95% or 99% confidence level (1) suggesting that the data tabulated in Fig 6 does not reliably support the hypothesis (1d).
- The student's hypothesis can be rejected/null hypothesis accepted (1)
- There is a weak negative correlation (1)

| 03 | 4 | **The student concluded that his data collection and processing had enabled him to reliably test his hypothesis and meet the aim of his enquiry.**

Using Figures 4, 5, 6, 7 and 8, to what extent do you agree?

AO3 – Use a range of information and techniques to synthesise and draw aspects of the study together. Evaluation of data collection and data processing in relation to the aim of the investigation.

Mark scheme
Level 3 (7–9 marks)
Detailed use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Detailed evidence of drawing together different elements of the study in order to support the response.

Level 2 (4–6 marks)
Clear use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Clear evidence of drawing together different elements of the study in order to support the response.

Level 1 (1–3 marks)
Basic use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Basic evidence of drawing together different elements of the study in order to support the response.

Notes for answers
• The student had a clear sampling strategy and simple data collection method that was appropriate to test the hypothesis and the use of statistical testing arguably increases the confidence in the findings. However, broader presentation, analysis and interpretation of the results may have supported narrow statistical analysis and identified geographical patterns in the data.
• There appears to be a mismatch between the hypothesis / data collected and the aims and objectives. The hypothesis focuses only on percentage of retail, whereas the aims and objectives were to investigate changing land use. A more detailed survey of the percentage of different categories of buildings would have yielded data that would support these wider aims and objectives.
• There is a lack of clarity about how the percentage of retail was calculated at each point and this may have affected the accuracy and reliability of results recorded. The use of other data at each point, such as photographs or field notes may have increased supported the student's estimates recorded.
• The size of the sample may be questioned. The student only surveyed 10 points. This is adequate to test for R_s but some may argue that a larger sample would have enabled the hypothesis to be tested more reliably. | **9**
AO3 = 9 |

- There was a large distance between sampling points and, as the sketch diagram indicates, this may have missed some key changes in land use. More sampling points, at shorter distances may have also enabled the hypothesis to be tested more reliably. In addition, the student only surveyed one side of the town and N, S E W transects may have increased reliability of findings. Sampling point one should have been 0 m on the transect.
- The use of secondary data sources could have helped the student meet the aims and objectives of the study. For example, OS maps, Goad maps and photographs.
- Overall, the student has collected and processed some data that would be useful for testing the hypothesis. However, there are questions about how far this meets the broader aims and objectives of the enquiry. There are also questions about the accuracy and reliability of how the data was collected and recorded. The data processing would enable the hypothesis to be tested but more could have been done to enable a more detailed geographical analysis in relation to the hypothesis and much more could have been done to meet the wider aims and objectives of the enquiry.

Credit any other valid approach.

04	1	**Suggest why the student decided to collect data using a systematic sample.** Point marked • Taking samples at fixed intervals from the high-tide line is easy and simple way to test a hypothesis about change over distance (1). • Systematic sampling can achieve good coverage of the study area (1) while providing a representative sample of data (1). • Systematic sampling reduces bias (1) as the points are pre-determined. • It is more straightforward to calculate sampling points using a map (1) and to execute data collection accurately (1d). • The sample is spread evenly over the whole distance (1) and avoids the clustering of points that may occur with random sampling (1d). Credit any other valid points.	**2** **AO3=2**

04	2	**Suggest how the student could present the data in Figure 11 to help show the relationship between distance from the high-tide mark and the percentage of marram grass.** Point marked • The student could have plotted a scatter graph (1) by using distance on the x axis against the percentage of marram grass on the y axis (1d) in order to draw a line of best fit (1d) to determine if there is a positive or negative correlation (1d). • The student could have over-lain percentage bars or proportional circles (1) onto the sketch transect (1d) to show change with distance from the high-tide line (1d). • The student could draw a simple percentage bar graph for each sample point (1). • The student could present the data as a line graph (1) to visually display the relationship between distance and the percentage of marram grass and identify general trends or anomalies (1d) • The data could be presented as a kite diagram (1). Credit any other valid points.	**2** **AO3 = 2**

04	3	**Complete the calculation of R_S in Figure 12 to two decimal places and use Figure 13 to interpret these findings.**	**4** **AO3 = 4**

Point marked
1 mark for accurate completion of the table
1 mark for accurate R_s
2 marks for interpretation.

Sampling Point	Distance from high tide-mark (m)	Rank of distance	Marram grass (%)	Rank of % marram grass	d	d^2
1	20	10	60	2	8	64
2	40	9	45	3	6	36
3	60	8	25	4	4	16
4	80	7	10	7.5	-0.5	0.25
5	100	6	5	**9**	**-3**	**9**
6	120	5	20	5	0	0
7	140	4	15	6	-2	4
8	160	3	10	7.5	-4.5	20.25
9	180	2	70	1	1	1
10	200	1	0	10	-9	81

$\sum d^2 = $ **231.5**

$6 \times \sum d^2 = $ **1389**

$$R_s = 1 - \frac{6\sum d^2}{n^3 - n}$$

$= 1 - \dfrac{\textbf{1389}}{990}$

$= 1 - $ **1.40**

$R_s = $ **−0.40**

- Accurate completion of the row for sampling point 5 to d^2 (1)
- Accurate completion of R_s calculation (1)
- The R_s co-efficient is not statistically significant either at 95% or 99% confidence level (1) suggesting that the data tabulated in Fig 6 does not reliably support the hypothesis (1d).
- The student's hypothesis can be rejected/null hypothesis accepted (1)
- There is a weak negative correlation (1)

04	4	**The student concluded that her data collection and processing had enabled her to reliably test her hypothesis and meet the aim of her enquiry.**	**9** **AO3 = 9**

Using Figures 9, 10, 11, 12 and 13, to what extent do you agree?

AO3 – Use a range of information and techniques to synthesise and draw aspects of the study together. Evaluation of data collection and data processing in relation to the aim of the investigation.

Mark scheme
Level 3 (7–9 marks)
Detailed use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Detailed evidence of drawing together different elements of the study in order to support the response.

Level 2 (4–6 marks)
Clear use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Clear evidence of drawing together different elements of the study in order to support the response.

Level 1 (1–3 marks)
Basic use of information about the enquiry which is used to evaluate how far data collection and processing were useful for testing the hypothesis and meeting the aim of the enquiry. Basic evidence of drawing together different elements of the study in order to support the response

Notes for answers
- The student had a clear sampling strategy and simple data collection method that was appropriate to test the hypothesis and the use of statistical testing arguably increases the confidence in the findings. However, broader presentation, analysis and interpretation of the results may have supported the narrow statistical analysis.
- There appears to be a mismatch between the hypothesis / data collected and the aims and objectives. The hypothesis focuses only on percentage of one species, marram grass whereas the aims and objectives were to investigate changing species diversity. Therefore, the data collected is unlikely alone to meet these wider aims and objectives of the investigation.
- The student needed to do a more refined survey of species diversity in order to meet the aims and objectives. For example, identifying and recording the percentage of different species at each sampling point.
- There is a lack of clarity about how the percentage of marram grass was calculated at each point and this may have affected the accuracy and reliability of results recorded. She appears to have recorded percentage of marram grass as a percentage of the metre square rather than as a percentage of the total species in that square. This could be problematic, for example, at sampling points where there was little total vegetation within 1 metre^2 but a wide variety of species.

- The use of 1m quadrats at each point may have increased accuracy of recording. Also, the use of other data at each point, such as photographs or field notes could have been used to check recordings made in the field.
- The size of the sample may be questioned. The student only surveyed 10 points. This is adequate to test for R_s but some may argue that a larger sample would have enabled the hypothesis to be tested more reliably. In addition, there is no suggestion of repeat testing or testing at different times of the year to increase reliability of data collected.
- There was a considerable distance between sampling points and, as the sketch diagram indicates, this may have missed some key changes in species diversity. More sampling points, at shorter distances may have also enabled the hypothesis to be tested more reliably. In addition, the student only surveyed one transect and further transects along the dunes may have increased reliability of findings.
- The use of secondary data sources could have helped the student meet the aims and objectives of the study. For example, OS maps, aerial photographs, species identification sheets etc.
- Overall, the student has collected and processed some data that would be useful for testing the hypothesis. However, there are questions about how far this meets the broader aims and objectives of the enquiry. There are also questions about the accuracy of how the data was collected and recorded. The data processing would enable the hypothesis to be tested but more could have been done to enable a more detailed analysis in relation to the hypothesis and much more could have been done to meet the wider aims and objectives of the enquiry.

Credit any other valid approach.