SPECIMEN ASSESSMENTMATERIAL

AS GEOGRAPHY

PAPER 2 HUMAN GEOGRAPHY AND GEOGRAPHY FIELDWORK INVESTIGATION

Mark scheme

Sample assessment material

V1.0

aqa.org.uk

2 June 2016

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 Assessment Writer.

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 average 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.

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	**Geographers talk about 'experienced places' and 'media places'. Which of the following statements about those places is true?** D	1 **AO1 = 1**

01	2	**Which of the following lists has endogenous and exogenous factors about a town in the correct columns?** C	1 **AO1 = 1**

01	3	**Name one place that you have studied.** **Name one artistic source (eg painting, song, text) and explain how it helped you to develop your knowledge and understanding of that place.** <u>Mark scheme</u> <u>Point marked</u> Award 1 mark for each relevant point with extra mark(s) for developed points (d). <u>Notes for answers</u> Responses may be based on the lived experience of the poet, artist, writer etc. They may consider the insights shown by the skills of the artist or writer and make specific references (in text) or details (in pictures) to features of the area. • eg The painting of the village centre by… shows the limited size and extent of the village in 1880 compared with the present day (1). • The housing is dominated by small terraced cottages, with a pub and church as the focus of activity (1). • The people depicted in the painting appear to be farmworkers, and the land surrounding the village is predominantly arable farmland (1) and there is no sign of the development of the housing estates, school and roads which are found in the same area today (1)(d).	3 **AO1 = 3**

01	4	**Using evidence from Figures 1a and 1b, analyse the main changes to the human geography of the area that have occurred in the period shown.** AO3 – Interpretation of, and comparison between, the two maps. Analysis of the changes which have taken place in the settlement's human characteristics over the period involved. <u>Mark scheme</u> **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 of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence. <u>Notes for answers</u> The question requires comparison between the two maps and analysis of changes which have taken place in the settlement's human characteristics over the period involved. Responses should analyse the changes in the human environment between 1899 and the present day, as depicted in the two maps. AO3 • During this period Cowley has become more built-up. In the north and west this is mainly grid pattern streets, suggesting terraced housing. • To the south, in Rose Hill, Littlemore and Blackbird Leys, the street pattern suggests post-1945 housing estates. • In the very south west corner there is a science park, stadium and school, showing quite different land uses. • In the east of Cowley are several large industrial buildings including the motor works. The industrial buildings are built alongside a new major dual carriageway road which appears to be part of a ring road around Oxford. • Further to the east, the area appears to be green belt (see footpath) so less change has occurred. However, Garsington has seen quite a lot of development, probably post-1945 housing, on the north west edge. • Horspath has also developed with growth along roads to the north and south east. The railway that used to run through Horspath now ends at the Cowley works. A line of pylons has been built across the green belt. • The Military College, Industrial School, Lunatic Asylum and several smithies have all gone since 1899.	6 **AO3 = 6**

01	5	**Name one source of quantitative data that you used to study your distant place.** **Evaluate the usefulness of that source in helping you to understand the place, by comparing it with the qualitative sources used to study that place.** AO1 – Knowledge and understanding of the chosen data source and of the qualitative sources with which the source is compared. Knowledge and understanding of the distant place chosen for study. AO2 – Application of knowledge and understanding by evaluation of the usefulness of the quantitative source and comparative qualitative sources, using appropriate evidence to support judgement. <u>Mark scheme</u> **Level 3** (7–9 marks) **AO1** – Demonstrates detailed knowledge and understanding of the chosen data source and of the qualitative sources with which the source is compared. **AO2** – Demonstrates detailed application of knowledge and understanding by evaluation of the usefulness of qualitative and quantitative sources. Judges their utility, synthesises information and uses appropriate evidence fully to support judgement. **Level 2** (4–6 marks) **AO1** – Demonstrates clear knowledge and understanding of the chosen data source and of the qualitative sources with which the source is compared. **AO2** – Demonstrates clear application of knowledge and understanding by evaluation of the usefulness of qualitative and quantitative sources. Judges their utility, partially synthesises information and uses some appropriate evidence to support judgement. **Level 1** (1–3 marks) **AO1** – Demonstrates basic knowledge and understanding of the chosen data source and/or of the qualitative sources with which the source is compared. **AO2** – Demonstrates basic application of knowledge and understanding by evaluation of the usefulness of qualitative and/or quantitative sources. Judges utility and uses limited evidence to support judgement.	9 **AO1 = 4** **AO2 = 5**

		Notes for answers The question requires the evaluation of a quantitative source of data used in the study of a distant place, comparing this source with qualitative sources used in studying the same place. AO1 • Knowledge and understanding of the chosen data source and of the qualitative sources with which that source is compared. The qualitative and quantitative sources should be specific to the chosen place. • Knowledge and understanding of the distant place (either in the UK or abroad) that has been chosen for study. • Credit relevant quantitative data from any source and from any time period, for instance census data, employment records, school catchment data, council tax records, land registry records. The census provides largescale, quantitative data, which has been used by national agencies to understand and plan for population growth and other demographic changes. The type of data source will depend on the location of the place, especially if situated beyond the UK. • Qualitative sources might include field observation, interviews with people who live in and have direct experience with local environments, narrative, descriptive, oral histories and interpretive sources, as well as field sketches, photographic and video evidence, artistic representation. AO2 • Application of knowledge and understanding to evaluate usefulness of the chosen quantitative source in studying local place. Older resources or those representing a more extended sequence of dates should tell more about the changes in the place. • Evaluation of the relative advantages of quantitative as opposed to qualitative sources. Composite quantitative data sources such as the census allow detailed objective information to be interpreted about a place, covering several social and economic dimensions. The data may be comprehensive, allowing comparisons to be made between places or parts of the same place. • Analysis of the ways in which qualitative information can complement numerical data, broadening the scope of the data to include people's experiences, perspectives and perceptions. It acknowledges the fact that human responses are often based on perception rather than externally-validated facts. • However, local and subjective knowledge may not be comprehensive, reliable or correct. People's perceptions and memories can be distorted, and interviewers' interpretations of what is said can be skewed. • Evaluation in the form of judging the utility, synthesising and comparing information about the two sources and coming to a	

		rational, evidence-based conclusion about the way that understanding of the place was built up. In reality the two types of source complement each other, and both may be essential to create a comprehensive picture of the place being studied.	

01	6	**Assess the extent to which the experiences of people living in a place that you have studied have been affected by the development of the area's infrastructure.** AO1 – Knowledge and understanding of the nature of the chosen place, the people who live there or who use that place and/ or of the economy of that place. Knowledge and understanding of the infrastructure of the place. AO2 – Analysis of connections between elements of the infrastructure and the way these affect both individuals and the community as a whole. Evaluation of the extent to which developments in infrastructure have influenced people's lives. <u>Notes for answers</u> The question makes connections between different parts of the specification content on Changing Places, specifically the linking of infrastructure development and people's lived experience of the chosen place. Responses should focus on an evaluation of the extent to which changes in infrastructure have influenced people's lives. AO1 • Knowledge and understanding of endogenous factors contributing to the character of place, particularly infrastructural developments. • The infrastructure of the place comprises the services essential to enable or enhance living conditions. It consists primarily of the large physical networks necessary for the functioning of a place. • Infrastructure includes communications such as roads, railways, canals, and/or airports. Other communications infrastructure may also be included, such as broadband and phone networks, along with services such as water supply, sewers and electrical grids. Provision of parks, public pools, schools, hospitals and libraries is also relevant. • Local, regional, national and international links might be considered, as well as past, present and proposed links. • Credit references to soft infrastructure such as the local education system, health care provision, local government, and law enforcement, as well as emergency services if relevant. • Knowledge and understanding of the local (or distant) place and the different groups that live there.	20 **AO1 = 10** **AO2 = 10**

		• Knowledge and understanding of historical developments in the chosen place relating to developments in communication, buildings, power supplies and other infrastructure. AO2 • Evaluation of the ways that infrastructure may affect different people and groups, with reference to gender, age, level of education, employment type (or unemployment), ethnic group and length of residence or work in that place. • Responses might examine, for example, the effects of improved communication links on employment patterns, leisure activities, shopping, access to education and social amenities. Clearly the effects of these developments will vary between different groups in the community. • Impacts of development of infrastructure may be largely positive. For instance the built environment may be upgraded in an urban neighbourhood by finding new uses for old and often empty buildings, or clearing them away to make way for new ones, with associated upgrading of water supply, sewers, electrical grids and telecommunications. Old warehouses may be converted into luxury apartments and flats. Communications may be improved, allowing swifter access to other parts of the city. New industries and services might locate in the area so there are more jobs, leisure and entertainment provision, thus improving lived experience of place. Brownfield sites may be redeveloped, re-using space and saving land in the process. Infrastructural changes may lead to re-imaging or changing the reputation of a city or an area by focusing on a new identity/function. • Allow for negative impacts of infrastructure on people's lives and on communities. For instance infrastructural developments in rural-urban fringe areas may cause expansion of suburbanised villages, greater commuting, increasing house prices, closure of local services, decline in bus services, more traffic congestion, negative environmental consequences. • Credit possible effect of changes in soft infrastructure such as the local education system, health care provision, and law enforcement. Crime prevention strategies and investment in better health care may lead to improved quality of life. • Analysis of connections between elements of the infrastructure and the way these affect both individuals and the community as a whole • Assessing the extent to which people's experiences have been affected by changes in infrastructure might include references to the way that these effects have varied over time and assessing how they might change in alternative possible futures. • Conclusion may emphasise the significance of infrastructural developments in causing change in people's lives, considering	

		both positive and negative impacts.	

Marking grid for Question 1.6

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.

Section B

02	1	**Explain why some form of sampling is almost always used when students are carrying out fieldwork to collect data for a geographical investigation.** Mark scheme Point marked Award 2 marks for knowledge and understanding of processes. (AO1) Notes for answers This will involve learned knowledge and understanding of the specification and of the fieldwork carried out. • In reality there is simply not enough time/energy/money/equipment/access to suitable sites to measure every single item or site within the area being studied (1). • Sampling in geography is important in order to limit the amount of information collected, but also to be representative of the whole population/to be statistically valid (1).	2 **AO1 = 2**

02	2	Study **Figure 2**, an aerial photograph of an area where a geographical investigation is to be undertaken. Using evidence from the photograph, explain why this area is suitable for a variety of geographical investigations. Point marked Award one mark for points of explanation. Allow additional mark for developed points (d). • A range of physical and human environments is evident in this area, so a variety of themes for investigation can be studied (1), such as:	4 **AO3 = 4**

		• Physical: beach transect/longshore drift survey/cliff erosion/local ecosystem/infiltration rates and river catchment studies/micro-climate (max 1) (d). • Human: tourism/ place of origin of visitors/ traffic flows/land use/ pollution/environmental quality/housing differences/place studies (max 1) (d). • The area covers a sizeable area so the scale provides potential for much variety (1). • Assuming safety precautions are taken, particularly in coastal areas, the area appears to be low to medium risk for undertaking fieldwork (1). • The area is generally accessible, with coastal footpaths and a network of roads, particularly close to and within the settlement (1).	

02	3	**State, using evidence from Figure 2, two appropriate hypotheses or questions for geographical investigation in this area. One should be based on physical geography. The other should be based on human geography.** <u>Point marked</u> The hypotheses or questions chosen should be appropriate to the area/location shown in the photograph and suitable in scale for AS level study. Allow 1 mark for each hypothesis. • eg Physical geography: How do longshore drift and wave action affect contrasting sections of coast? (1) or Longshore drift and wave action have contrasting effects on different sections of coast (1). • eg Human Geography: To what extent does environmental quality vary in…? or Environmental quality varies over short distances in the coastal town of… (1).	2 **AO3 = 2**

02	4	**Explain how the investigation helped you develop your geographical understanding of the place studied.** AO1 – Knowledge and understanding of the investigation process and aims, as well as its outcomes. AO2 – Application of knowledge and understanding to show how the findings of the study have helped develop geographical understanding of place	6 **AO1 = 2** **AO2 = 4**

Mark scheme

Level 2 (4–6 marks)

AO1 – Clear knowledge and understanding of the findings of the study. Appropriate knowledge and understanding of the characteristics of place and how this has been developed as a result of the study.

AO2 – Clearly applies knowledge and understanding to interpret findings of the study. Interprets findings to suggest how these have supported the wider fieldwork aims by linking directly to improved understanding at the study site.

Level 1 (1–3 marks)

AO1 – Basic knowledge and understanding of the findings of the study. Appropriate knowledge and understanding of the characteristics of place and how this has been developed as a result of the study.

AO2 – Basic application of knowledge and understanding to findings of the study. Limited interpretation of findings to suggest how these have supported the wider fieldwork aims. Basic links to improved understanding at the study site.

Notes for answers

There is some requirement for knowledge and understanding of the methods undertaken, but the emphasis in this the question is on applying knowledge and understanding to make judgments, evaluate and analyse aspects of the fieldwork investigation.

AO1

- Knowledge and understanding of the different stages of the enquiry process.
- Knowledge and understanding of the conceptual basis of the investigation, links to geographical theory, the results and final outcomes
- Characteristics of the place studied, including its physical and human features. Selected endogenous and exogenous factors affecting the character of the place as relevant to the investigation, for instance the location, topography, relief and drainage, land use, built environment, infrastructure, demographic and economic characteristics

AO2

- Application of knowledge and understanding to interpret the impact of the study in developing geographical understanding of the place. Assessment of any aspect of geographical understanding of the specific place investigated can be credited.
- Similarly, any stage in the investigation process, (such as

		secondary research, observation and recording of field data, evaluation and reflection) may help to give an appreciation of the type of place being studied. • Application of knowledge and understanding to show how the findings of the study have further developed geographical understanding of place. The investigation may provide insight into the physical characteristics of the place, or may yield information about the land use, built environment and infrastructure. • Depending on the nature of their investigation, responses may focus on the demographic, economic or cultural aspects of the place. Urban studies may give information about social inequalities, patterns of land use and changes in commercial activity over time. A study of a coastal landscape may reveal details of its physical setting, its topography, accessibility and physical landforms. • Accept explanations which focus on how specific methods of investigation may help in understanding the nature of a place. For example, questionnaires may indicate people's perception of place, land use studies may show the range of economic activities, and field sketching/photo annotation may help to show variation in the landscape and built up area.	

02	5	**Evaluate the success of your data collection methods and explain how you would make use of an opportunity to revisit the location to develop your enquiry further.** AO1 – Knowledge of the fieldwork enquiry that was carried out, specifically the data collection methods and the location(s) visited AO2 – Evaluation of the effectiveness of the data collection methods and their application during the enquiry process. Application in a new context (the revisit to the location) to revise or extend the enquiry. <u>Mark scheme</u> **Level 3** (7–9 marks) AO1 – Detailed knowledge and understanding of the data collection methods used in the enquiry process. AO2 – Detailed evaluation of methods to assess their utility and reliability. Rational conclusions reached as to how the work could have been improved and/or taken forward in future, thus developing a new situation and set of circumstances from the original enquiry. **Level 2** (4–6 marks)	9 **AO1 = 3** **AO2 = 6**

		AO1 – Clear knowledge and understanding of the data collection methods used in the enquiry process. AO2 – Clear evaluation of methods to assess their utility and reliability. Partial conclusions reached as to how the work could have been improved and/or taken forward in future, thus developing a new situation and set of circumstances from the original enquiry. **Level 1** (1–3 marks) AO1 – Basic knowledge and understanding of the data collection methods used in the enquiry process. AO2 – Basic evaluation of methods to assess their utility and reliability. Basic conclusions reached as to how the work could have been improved and/or taken forward in future. <u>Notes for answers</u> The question requires an evaluation of the effectiveness of the methodology used in relation to the fieldwork investigation carried out by the candidate and consideration of possible rationale for revisiting the location for further work. AO1 • Knowledge and understanding of the fieldwork enquiry carried out, specifically the purpose of the enquiry, details of the data collection methods and their justification. • Familiarity with the location visited including details of data collection sites. • Knowledge and understanding of the process of data collection within the enquiry sequence, including the purpose of observation and recording of field data relevant to the topic under consideration, selection of quantitative and qualitative techniques, the justification of practical approaches adopted in the field. • Awareness of strategies for ensuring accuracy and reliability such as timings, frequency of observation, duration and sampling strategies. • Knowledge and understanding of the process of evaluation within the enquiry sequence, including the critical examination of field data in the light of methods adopted and improvements to methodology. AO2 • Evaluation of the effectiveness of data collection methods and their application during the enquiry process. • Evaluation of the effectiveness of methods may be linked to logistical problems. There may be issues with accuracy of data collection techniques, unrepresentative sampling, inadequate	

		or rudimentary equipment, unwillingness of people to participate in surveys, selection of times and locations, organisational aspects such as poor team work with unallocated roles, unreliability of method in targeting the question or hypothesis. • Credit suggestions for improvements to methodology such as the use of more sophisticated and accurate digital equipment, more rigorous sampling techniques, repeating measurements at different times or for longer periods, piloting questionnaires and other methods allowing for reflections and modifications to data collection techniques to ensure quality and accuracy of data collected, greater emphasis on qualitative data methods. • In suggesting possible reasons for revisiting the location, responses may focus on improvements to methods and/or sampling, new study sites, perhaps involving different time frames, repeating the study, or a new line of enquiry arising out of the findings of the original study. • The evaluation of the data collection methods might show them to have been successful. In that case, an opportunity to revisit the site would allow the candidate to extend and develop his/her enquiry. To do this the same or similar techniques could be used but in a different temporal or spatial context, to develop the depth of the enquiry. On the other hand, new techniques could be tried to develop the breadth of study. • If the evaluation of the techniques shows that they had been unsuccessful, the revisit might concentrate on improving or modifying the techniques, or on improving the way that the students carried out those techniques. • The evaluation could be less clear-cut. This might mean that slight modification was needed but also that the enquiry could be extended by using additional techniques.	

03	1	**Complete the calculation of Rs (show your working).** Allow 1 mark for each stage in the calculation. 6.25 (1 mark) 44.5 and 267 (1 mark) 0.27 (1 mark) 0.73 (1 mark) See below for fully completed table:	4 **AO3 = 4**

Sample distance from site		Rank of distance	Yes %	Rank Yes %	d	d^2
Area	(km)	R1		R2	(R1–R2)	
1	4.5	9	56	7	2	4
2	3.5	7	38	4	3	9
3	2.5	5	14	**2.5**	**2.5**	**6.25**
4	1.5	3	12	1	2	4
5	0.5	1	14	2.5	–1.5	2.25
6	1.0	2	47	5	–3	9
7	2.0	4	53	6	–2	4
8	3.0	6	58	8	–2	4
9	4.0	8	61	9	–1	2
10	5.0	10	70	10	0	0

$\sum d^2 =$ **44.5**

$6 \times \sum d^2 =$ **267**

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

$$= 1 - \frac{\textbf{267}}{990}$$

$= 1 -$ **0.27**

$=$ Rs **0.73**

03	2	**How confident can you be that the student's hypothesis, 'People are more pleased with the factory closure as distance from the old factory site increases' is supported by the data?** <u>Mark scheme</u> • There is a 95% certainty that there is a significant correlation (1)...and that this correlation is positive (1). • This suggests that people closest to the factory are not happy to see the factory closed and vice versa (1).	2 **AO3 = 2**

03	3	**Draw a best fit line of the graph, Figure 7.** Mark scheme • If the best fit line is drawn accurately, with the same number of points on either side of the line, allow 2 marks. • If the best fit line is drawn approximately with an uneven number of points on either side of the line, allow 1 mark.	2 **AO3 = 2**

03	4	**To what extent does the evidence in Figures 3, 4 and 7 support this hypothesis?** AO3 – Use of a range of data to synthesise and draw aspects of the study together. Analysis and evaluation of data in order to draw meaningful conclusions from the evidence provided. Mark scheme **Level 3** (7–9 marks) **AO3** – Detailed use of data from the enquiry which is analysed and evaluated to construct sound arguments and draw valid conclusions. Detailed evidence of drawing together different elements of the study in order to support the response. **Level 2** (4–6 marks) **AO3** - Data from the enquiry is analysed and evaluated clearly to construct arguments and draw conclusions. Clear evidence of drawing together different elements of the study in order to support the response. **Level 1** (1–3 marks) **AO3** – Basic use of data from the enquiry which is analysed and evaluated to construct limited arguments and draw basic conclusions. Basic evidence of drawing together different elements of the study in order to support the response. Notes for answers The question requires an evidenced-based summary and conclusion, evaluating the link between the two variables stated in the initial hypothesis. AO3 • Uses a range of data available from the information provided to synthesise and draw aspects of the study together into an overall conclusion • There is a clear trend supporting the hypothesis, with the BFL clearly trending from bottom left to top right.	9 **AO3 = 9**

		• However the correlation is not strong as very few points are actually close to the BFL. In fact there is an upper trend line and a lower trend line, both of which support the hypothesis although the link is weak. One or more other factors appear to be involved. • Credit the idea that people living on one side of the town (1–5) are less pleased with the closure than people living on the other side (6–10) so the hypothesis can be developed accordingly. • Consideration of possible reasons for that difference. For instance it may be that winds from the west blew fumes towards areas 6–10 and so the benefits of closure were greater for people living in that area. • On the other hand it may be that the factory drew a higher proportion of workers from housing in areas 1–5 so people in this area were more likely to have lost jobs due to the closure. • Other explanations might be offered. Any such explanation might lead to a development of the original hypothesis. • Overall conclusion may emphasise that whilst the association between the two variables is clear and that the hypothesis is generally substantiated by the evidence, close inspection of the data reveals that other factors are relevant in explaining the anomalous readings.	

4	1	**Complete the calculation of Rs (show your working).** Allow 1 mark for each stage in the calculation. 20.25 (1 mark) 124.5 and 747 (1 mark) 0.755 (1 mark) 0.245 (1 mark) See below for fully completed table:	4 **AO3 = 4**

Sample site	Rank altitude	Infiltration time	Rank time	d	d^2
Altitude (m)	R1	(secs)	R2	(R1–R2)	
155	1	55	8	–7	49
150	2	33	6	–4	16
145	3	28	5	–2	4
140	4	26	4	0	0
135	5	22	3	2	4
130	6	20	**1.5**	**4.5**	**20.25**
125	7	20	1.5	5.5	30.25
120	8	40	7	1	1
115	9	82	9	0	0
110	10	120	10	0	0

$\sum d^2 =$ **124.5**

$6 \times \sum d^2 =$ **747**

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

$$= 1 - \frac{\textbf{747}}{990}$$

$= 1 -$ **0.755**

$=$ Rs **0.245**

04	2	**How confident can you be that the student's hypothesis, 'The rate of infiltration will be faster on the high land than it is on the lower land that is on or close to the flood plain' is supported by the data?** <u>Mark scheme</u> • The correlation is not significant at even the 95% level (1). • ... and therefore the hypothesis cannot be accepted (1).	2 **AO3 = 2**

04	3	**Draw a best fit line on the graph, Figure 12.** Mark scheme • If the best fit line is drawn accurately, with the same number of points on either side of the line, allow 2 marks. • If the best fit line is drawn approximately, with an uneven number of points on either side of the line, allow 1 mark.	2 **AO3 = 2**

04	4	**To what extent does the evidence in Figures 8, 9 and 12 support the hypothesis?** AO3 – Use of a range of data to synthesise and draw aspects of the study together. Analysis and evaluation of data in order to draw meaningful conclusions from the evidence provided. Mark scheme **Level 3** (7–9 marks) **AO3** – Detailed use of data from the enquiry which is analysed and evaluated to construct sound arguments and draw valid conclusions. Detailed evidence of drawing together different elements of the study in order to support the response. **Level 2** (4–6 marks) **AO3** – Data from the enquiry is analysed and evaluated clearly to construct arguments and draw conclusions. Clear evidence of drawing together different elements of the study in order to support the response. **Level 1** (1–3 marks) **AO3** – Basic use of data from the enquiry which is analysed and evaluated to construct limited arguments and draw basic conclusions. Basic evidence of drawing together different elements of the study in order to support the response. Notes for answers The question requires an evidenced-based summary and conclusion, evaluating the link between the two variables stated in the initial hypothesis. AO3 • Uses a range of data available from the information provided to synthesise and draw aspects of the study together into an	9 **AO3 = 9**

		overall conclusion. • There is a clear trend reflected in the data plot. The graph shows an approximate U-shaped curve. • This is because the low flat land close to the river shows very slow infiltration but the high, gently sloping land on the upper valley side also has fairly slow infiltration. • The fastest rates of infiltration are recorded at the intermediate points on the transect, which also happen to have steeper slopes. • Thus the initial hypothesis 'The rate of infiltration will be faster on the high land than it is on the lower land that is on or close to the flood plain' is only partially supported by the evidence. • Credit the idea that the land near the river is on a flood plain which is probably an area where water accumulates and so the soil is highly saturated. The land on the hill top is also fairly flat and so run-off will be slow. • The land on the hill top may also be an area of peat accumulation and as peat holds water, it may also be close to saturation. • The steepest slopes will have more rapid run-off and so the soil is likely to be better drained and less saturated. • Other explanations might be offered. Any such explanation might lead to a development of the original hypothesis. • Overall conclusion may emphasise that the association between the two variables is unclear and that the hypothesis is too simplistic Other geographical factors are relevant in explaining the anomalous readings.	

2 June 2016