Teacher Resource Bank

GCE Geography

Additional Sample Question:

- GEO4A :Geography Fieldwork Investigation

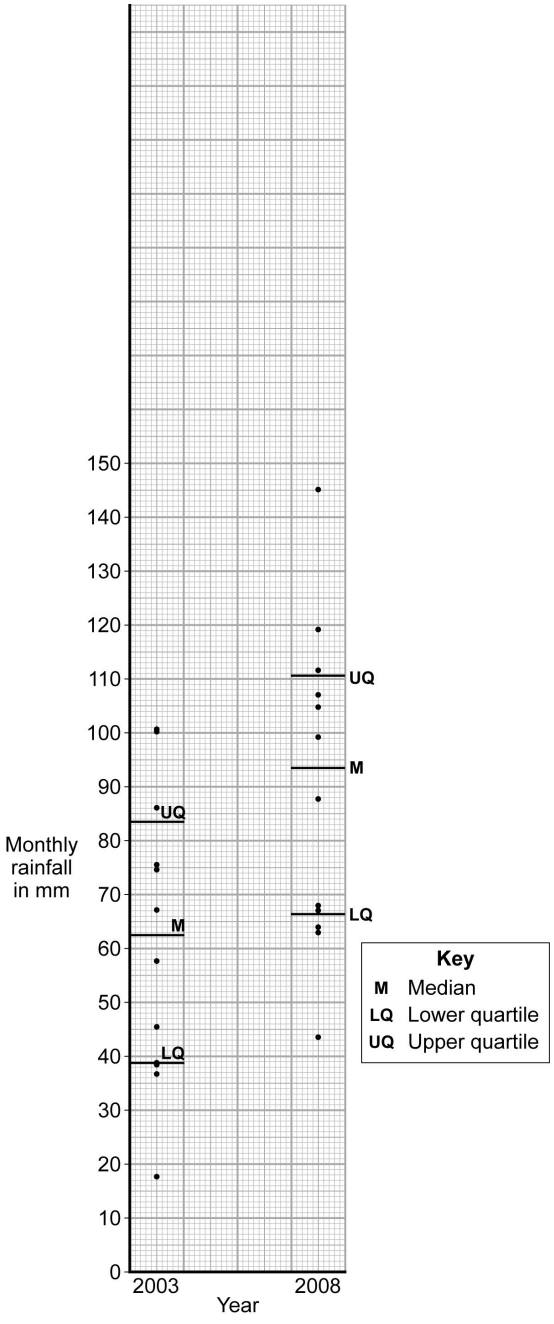
SECTION B

Answer the questions in the spaces provided

Total for this question: 20 marks

1 **Figure 1** shows monthly rainfall data collected daily at a school weather station in 2 separate years. The data for 2003 and the first 9 months of 2008 data was obtained as secondary data; the individual student investigation involved collecting the last 3 months data on a daily basis as primary data in the field to investigate rainfall variability.

Figure 1



1 (a) The median, upper quartile and lower quartile have been calculated and drawn on both graphs. The calculations are shown in **Figure 2**

Figure 2

	2003	2008
Median	62.45	93.55
Upper quartile	83.48	110.63
Lower quartile	38.9	66.3

Comment on the variability of rainfall for 2003 and 2008 using the information shown in **Figures 1** and **2**.

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(10 marks)

1 (b) Assess the usefulness of dispersion graphs and other relevant techniques to analyse such data collected in the field.

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(10 marks)

20

Version : 02/07/2009

General Certificate of Education

Geography 2030

GEO4A Geography Fieldwork Investigation

Specimen Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

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Registered address: AQA, Devas Street, Manchester M15 6EX *Dr Michael Cresswell Director General*

Mark schemes – layout and style
The mark scheme for each question will have the following format:
a) Notes for answers (nfa) – exemplars of the material that might be offered by candidates
b) Mark scheme containing advice on the awarding of credit and levels indicators.

Point marking and Levels marking
a) Questions with a mark range of 1-4 marks will be point marked.
b) Levels will be used for all questions with a tariff of 5 marks and over.
c) Two levels only for questions with a tariff of 5 to 8 marks.
d) Three levels to be used for questions of 9 to 15 marks.

Levels Marking – General Criteria
Everyone involved in the levels marking process (examiners, teachers, students) should understand the criteria for moving from one level to the next – the "triggers". The following general criteria are designed to assist all involved in determining into which band the quality of response should be placed. It is anticipated that candidates' performances under the various elements will be broadly inter-related. Further development of these principles will be discussed during Standardisation meetings. In broad terms the levels will operate as follows:

Level 1: attempts the question to some extent (basic)
An answer at this level is likely to:
- display a basic understanding of the topic
- make one or two points without support of appropriate exemplification or application of principle
- demonstrate a simplistic style of writing perhaps lacking close relation to the terms of the question and unlikely to communicate complexity of subject matter
- lack organisation, relevance and specialist vocabulary
- demonstrate deficiencies in legibility, spelling, grammar and punctuation which detract from the clarity of meaning.

Level 2: answers the question (well/clearly)
An answer at this level is likely to:
- display a clear understanding of the topic
- make one or two points with support of appropriate exemplification and/or application of principle
- give a number of characteristics, reasons, attitudes ("more than one") where the question requires it
- provide detailed use of case studies
- give responses to more than one command e.g. "describe and explain.."
- demonstrate a style of writing which matches the requirements of the question and acknowledges the potential complexity of the subject matter
- demonstrate relevance and coherence with appropriate use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, grammar and punctuation which do not detract from the clarity of meaning.

Level 3: answers the question very well (detailed)
An answer at this level is likely to:
- display a detailed understanding of the topic
- make several points with support of appropriate exemplification and/or application of principle
- give a wide range of characteristics, reasons, attitudes, etc.
- provide highly detailed accounts of a range of case studies
- respond well to more than one command

- demonstrate evaluation, assessment and synthesis throughout
- demonstrate a sophisticated style of writing incorporating measured and qualified explanation and comment as required by the question and reflecting awareness of the complexity of subject matter and incompleteness/ tentativeness of explanation
- demonstrate a clear sense of purpose so that the responses are seen to closely relate to the requirements of the question with confident use of specialist vocabulary
- demonstrate legibility of text, and qualities of spelling, grammar and punctuation which contribute to complete clarity of meaning.

1(a)	**Notes for answers**	*(10 marks)*

This involves an assessment of both dispersion graphs for 2003 and 2008 (as shown on Figure 1). Dispersion graphs show the visual distribution of data for a location over a period of time. Greater ranges of data show the variability of the phenomenon. In this case, the two graphs can be compared, showing that 2003 has a lower amount of rainfall when compared with 2008.

Measures of dispersion (central tendency) are also shown (Figure 1) and the values given (Figure 2). These are the mean, median, upper quartile and lower quartile and the interquartile range.

The median is the middle point of a range of data, arranged in size order. It is an actual number, unless there is an even number of points, in which case it is the average of the middle two points, as in this case. The calculation is (n + 1)/2.

1. The lower quartile is the quarter point from the bottom of the rank order and the upper quartile is the three quarter point from the bottom of the rank order (lower quartile is (n + 1/4) from bottom of rank order and upper quartile is 3(n + 1/4)

2. The interquartile range shows the dispersion of the set of values around the median and is the difference between the upper and lower quartiles. 50% of all values in the distribution fall within the range. The smaller the interquartile range, the more the values are grouped around the median. The quartile deviation is the IQR/2.

3. In the case of Figure 1, the values of the median, upper and lower quartiles are greater for 2008, but the IQR is virtually the same (44.58 to 44.33, thus showing that the variability of rainfall for the two years is very similar, despite the very different totals.

The candidate can suggest any point that is well argued.

Level 1 (0-4 marks)
There is a basic description of the graphs and what they are used to show. There will be little reference to the figures or to the usefulness of the measures of dispersion in presenting the data. There will be straightforward expression.

Level 2 (5-8 marks)
There will be a clear summary and commentary on the graphs in presenting the data. This may be minimal at the lower end of the band, with clearer reference to Figure 1 and/or 2 at the upper end of the band. Reference to the graphs will be clear and explanatory, and there will be comment on the role of the measures of dispersion. Expression will be competent.

Level 3 (9-10 marks)
There will be a detailed summary and commentary on the dispersion graphs as well as the measures of dispersion, including specific reference to Figures 1 and 2. There will be a detailed assessment of the variability of rainfall as shown in the figures. Expression will be detailed and sophisticated.

1(b)	**Notes for Answers**	***(10 marks)***
AO	Dispersion graphs are ideal for showing the range of ranked data. In this case, the range of the two graphs can be easily compared. In addition, the data can be analysed by the calculation of the mean, median, the upper and lower quartiles and the interquartile range and a direct comparison made. This dispersion information collected in the field and the measures of central tendency then calculated can then be compared both with each other and with similar data from secondary sources. Other techniques that can be used to analyse this type of data include standard deviation, which shows the dispersion of data around the mean (a high SD indicates a wide spread, whereas a low SD indicates the data is clustered around the mean) and the standard error ($SD/\sqrt{n}$). This identifies the confidence level of the sample mean. Graphically, a histogram, frequency polygon and cumulative frequency curve can be used to show the data, as well as the dispersion graph. These additional techniques can be employed to further enhance the analysis of the data collected in the field, which could be of any ordinal type, though the most common are river flow and meteorological data. **Level 1 (1-4 marks)** There is a basic description of the dispersion graphs. There will be little reference to the usefulness of the dispersion graphs and no reference to other relevant techniques to show the data. Field work references will be minimal. There will be straightforward expression. **Level 2 (5-8 marks)** There will be a clear assessment of the usefulness of dispersion graphs for analysing these data. There will be some awareness of other relevant techniques, which could be either statistical or graphical, and references to fieldwork will be present, but inconsistent. Expression will be competent. **Level 3 (9-10 marks)** There will be a detailed summary of the usefulness of dispersion graphs for analysing the data. There will be detailed reference to other relevant techniques, both statistical and graphical. There will be a well argued assessment. Expression will be detailed and sophisticated.	