GCSE

eduqas
Part of WJEC

WJEC Eduqas GCSE in

GEOGRAPHY B

ACCREDITED BY OFQUAL

TEACHER HANDBOOK

Teaching from 2016

wjec
cbac

This Ofqual regulated qualification is not available for candidates in maintained schools and colleges in Wales.

Contents

Aims of WJEC Eduqas GCSE (9-1) Geography B	1
Understanding the Assessment Objectives	3
Developing programmes of study for WJEC Eduqas GCSE (9-1) Geography B	6
Introducing Component 3	23
FAQs for fieldwork in WJEC Eduqas GCSE (9-1) in Geography B	26
The use of mathematics and statistics in geography	29
Useful Interactive Resources	33

Aims of WJEC Eduqas GCSE (9-1) Geography B

The overarching aims of this qualification are that learners should develop the ability to think 'like a geographer'. That is to say, learners will develop the skills necessary to conduct framed enquiries in the classroom and in the field in order to develop their understanding of specialised geographical concepts and current geographical issues. By following this specification learners will achieve the following objectives. They will develop the ability to think:

- creatively, for example, by posing questions that relate to geographical processes and concepts that include questioning about spatial pattern and geographical change
- scientifically by collecting and recording appropriate evidence from a range of sources, including fieldwork, before critically assessing the validity of this evidence and synthesising their findings to reach evidenced conclusions that relate to the initial aim of their enquiry
- independently by applying geographical knowledge, understanding, skills and approaches appropriately and creatively to real world contexts. In so doing they should appreciate that geography can be 'messy', i.e. that real geography does not always match typical or predicted outcomes.

WJEC Eduqas GCSE (9-1) in Geography B adopts a distinctive problem solving approach to the study of interactions between people and the environment. Learners should be given the opportunity to consider the points of view of those who have a vested interest when they are affected by contentious geographical change. Learners will become informed and reflective citizens when they consider a range of viewpoints, values and attitudes which are held by stakeholders on a number of key geographical issues. The problem solving approach is reflected especially in Component 2 and in Part C of Component 3.

WJEC Eduqas GCSE (9-1) in Geography B develops an enquiry approach to the study of geographical information, issues and concepts. It is based on the principle that geographical education should enable learners to become critical and reflective thinkers by engaging them actively in the enquiry process. Content is organised around key questions and learners should develop the ability to pose geographical questions of their own, whether this is during classroom based activities or fieldwork.

Figure 1 *Progression through geographical enquiry (based on an idea presented by Margaret Roberts, former senior lecturer at Sheffield University)*

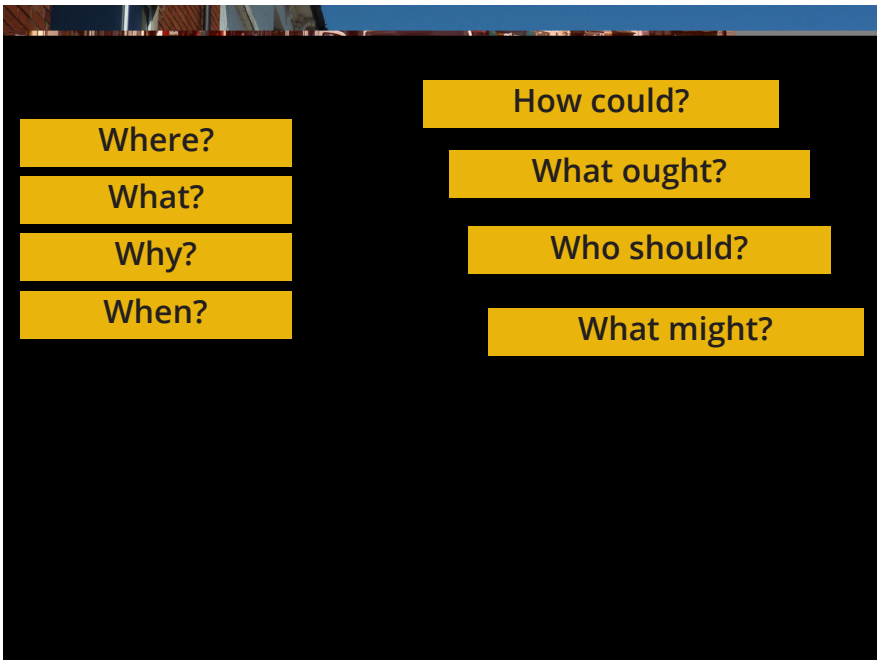
	Closed task	Framed enquiry	Independent enquiry
Questions	A task is presented. Questions are not explicit.	Enquiry questions are selected by teachers, but are explicit.	Students decide enquiry questions, framed by teacher input.
Data	Decisions about fieldwork procedure are made by teachers. Data is presented as authoritative evidence.	Decisions about fieldwork procedure are made largely by teachers. Data is presented as information to be interpreted.	Students are involved in key decisions about fieldwork procedure and data sources.
Making sense	Activities devised by teacher to achieve pre-determined objectives. Students follow instructions.	Methods of representation are open to discussion and choice. Analysis is independent.	Students independently analyse evidence and make decisions/reach conclusions.
Reflection	Predictable outcomes.	Students discuss what they have learnt; different outcomes.	Students consider the validity of evidence/reliability of data and methods.

Figure 1, based on an idea presented by Margaret Roberts, indicates the degree of independence (columns) of the student at each stage of the enquiry process (rows). The diagram represents a continuum between tasks that have been set by the teacher on the left and an enquiry process that is driven by the learner on the right. Learners will demonstrate progression if their enquiries are characterised by increasing independence as they move across the diagram from left to right.

Students working in the left-hand column may demonstrate competence in a number of geographical skills including data collection, recording and representation. But, since they have not been involved in making wider decisions about **what** to investigate, **why** they are investigating it and **how** to structure the enquiry, they will struggle to draw wider conclusions about how their enquiry relates to wider geographical concepts or processes. Furthermore, this limited involvement in the enquiry process means that the student has limited ability to evaluate the process of learning, and will therefore make limited progress next time they conduct a fieldwork enquiry.

The enquiry approach offers opportunities for meta-cognition. One of the values of the enquiry process has to be the evaluation of not only **what** was learned but also **how** it was learned, since this informs the next geographical enquiry. An enquiry approach requires learners to be able to identify issues and pose geographical questions. Figure 2 illustrates a useful classroom strategy.

Figure 2 *Structuring questions using 7 Ws and an H*



Traditionally, questioning begins with one of the 5 Ws. What, where, when and who will tend to prompt descriptive responses, whereas **why** will elicit explanation. 'Who' is perhaps neglected, but is a useful question opener. 'Who would be affected if this high street bank were to close?' 'Who makes decisions about managing parking in this street?'

In order to extend the 5 Ws, we should prompt learners to ask 'How?' How may lead to questions being asked about change over time. 'How has this High Street changed?' 'How could it be improved for shoppers?' This leads learners into thinking about alternative future geographies, as does 'What might?' Such questions result in a deeper level of enquiry than the traditional 5 Ws. The use of 'What ought?' opens another dynamic. It leads learners into considering the ethical dimensions of an issue. 'What ought to be done to improve pedestrian safety and access for those with disabilities?'

The value of adopting the enquiry approach to teaching and learning in GCSE Geography will become apparent when one considers the way in which knowledge and understanding will be assessed. Of the 240 marks available, 15 per cent (36 marks) will be an assessment of the recall of knowledge, whereas 35 per cent (or 84 marks) will be an assessment of the application of knowledge and understanding. Students will be better prepared for these 84 marks if they have been actively involved in framed enquiries.

Similarly, a popular urban fieldwork enquiry investigates the factors (or externalities) that affect quality of life. It would be feasible to design an enquiry that could be repeated every year that:

- includes the use of a transect through different urban environments
- measures the flow of traffic and associated noise levels at points along the transect
- uses a qualitative technique (such as bi-polar technique or questionnaires) so that perception of the environment can be analysed
- measures change over time by taking traffic flow readings at different times of day (to assess levels of commuting), or by comparing primary data with data collected in previous years.

Creating time for preparation and consolidation

The following model is recommended when planning the two fieldwork enquiries:

Step 1 Classroom preparation for the first fieldwork enquiry:

(a) Virtual trip to the field study area to give the learners some contextual understanding of place

(b) Encouraging learners to pose geographical questions for study on the field trip

(c) Discussing sampling strategies for collecting data on flows and/or qualitative data, for example, use of closed and open questions, Likert scale or bi-polar techniques and/or the use of transects

(d) Creating survey sheets.

Step 2 *Conduct the first fieldwork.*

Step 3 Consolidate learning of the first fieldwork enquiry by:

(a) Collating and tabulating results

(b) Representing the results using a variety of different graphical or cartographical techniques

(c) Drawing conclusions

(d) Relating understanding of the unique field study site to the learners' wider understanding of UK geography/concepts

(e) Evaluating the strengths and limitations of the methods used to collect and represent the data

(f) Considering ways of improving this fieldwork enquiry

(g) Asking questions about how and where the methodology/concept could have been explored in different environments to the locations visited.

Step 4 Preparing for the second fieldwork enquiry. This will mean repeating step 1 for the new field trip. If it is appropriate to use, for example, qualitative data in the second field trip, then learners will have the opportunity to reflect on their use of qualitative data during their preparation for this trip. In this way, the enquiry process becomes cyclical, as shown earlier in Figure 5.

FAQs for fieldwork in WJEC Eduqas GCSE (9-1) in Geography B

1 What does the specification mean when it says that the fieldwork has to be conducted in contrasting environments?

There is an expectation that learners should experience both human and physical fieldwork. For example, if one fieldwork were to focus on the physical processes of a river or coastline, then the other fieldwork experience should investigate human geography set in an urban or rural context. Of course, many high quality fieldwork experiences investigate the interaction between human and physical geography. The following titles illustrate this approach:

How should coastal communities on the North Norfolk coastline be protected from sea level rise?

What are the positive and negative impacts of tourism on the economy and environment of Castleton in Derbyshire?

Which land uses in Shrewsbury are most vulnerable to river flooding?

Our top tip would be that if schools organise one fieldwork experience that investigates human-physical interactions, then you will have a free choice for the second fieldwork experience: it could be **either** physical **or** human.

2 Can I use the school grounds to do one or both of my fieldwork enquiries?

No. The regulations require you to use contrasting environments outside of the classroom or the school grounds for the two fieldwork enquiries. However, there is no reason why you cannot use the school grounds for other fieldwork opportunities in addition to the two required by the regulations. You might use the school grounds in preparation for one of your fieldwork enquiries – to prepare students, for example, in the use of transects in the field.

3 Do I have to offer two days of fieldwork to my students?

No, not necessarily. The requirement is that learners experience two fieldwork experiences in contrasting environments, but time limits are not given. In theory, two fieldwork experiences could be achieved in a number of different ways. WJEC wants teachers to have complete flexibility and autonomy in the logistical arrangements for their fieldwork. There are different models, for example:

1. One day of fieldwork in which the set methodology is used in the morning and the set concept is investigated in the afternoon. This model clearly has least impact on curriculum time, but it doesn't allow learners to reflect on their first fieldwork experience before applying what they have learned during the second field trip.

2. Two separate days of fieldwork, in which the same methodological approach is taken, with a gap of a few days or weeks between the two trips. The advantage of this model is that learners will be able to evaluate the first field trip and use this experience to prepare for the second one.

3. A residential field trip of two or more days. A residential trip would also allow time for evaluation of the first fieldwork and preparation for the second in the evening.

4 I understand that I have to focus on a set methodology. Will it be ok to use other methods of data collection, for example, transects or the measurement of flows, in the second field trip?

Yes. The focus of the assessment is on the six stages of the enquiry process (described on page 19 of the specification). One of these is evaluation (stage six), so WJEC recommends that you use the set methodology in both fieldwork enquiries so that learners can develop and consolidate their understanding of this methodology. However, it would also be fine to use any other methods of data collection during either field trip if they are relevant to the context of your enquiry.

5 Do we need to spend any time in class before and after each field trip?

It is important to remember that the learners will be assessed on their understanding of the six stages of the enquiry process (described on page 19 of the specification) during Parts A & B of Component 3. It is important to give learners sufficient time to develop their understanding of each of these stages. This will inevitably mean using some classroom or homework time to prepare for and consolidate their learning for each field trip. As mentioned under FAQ 2, you might decide to use the school grounds as part of the preparation phase before taking students on fieldwork outside of the school grounds.

The assessment of fieldwork is worth 15% of the total assessment package (and the assessment of the application of the conceptual framework to a wider UK scale is worth a further 15%). WJEC recommends that learners spend about 18 hours on preparation and consolidation of their understanding of the fieldwork element. When added to the time taken for the field trip itself, this represents a little over 20% of the total 120 Guided Learning Hours for the whole qualification.

6 Do learners need to write up a fieldwork report?

Learners will need to understand how to process and present data, analyse trends, draw conclusions and identify strengths and weaknesses in their fieldwork. One way to consolidate this learning would be to encourage learners to write up a traditional fieldwork report. However, this is not essential. An alternative approach would be to encourage students to compile a fieldwork portfolio which would represent the process of the full enquiry rather than be a finished product in itself. If so, it could be more informal and sketchy than a traditional fieldwork report and include items such as:

- notes, sketches or photographs taken during the fieldtrip
- collated tables of results
- examples of data representation (which do not necessarily need to be complete) with notes on their limitations and strengths.

Teachers will need to decide whether writing up a full report is the best way for learners to prepare for Component 3, or whether a more process-driven portfolio is the better model.

7 Does the first fieldwork just focus on methods of data collection? Can I create a full enquiry which follows all six stages of the enquiry process?

You can do either. You could:

(a) focus on the sampling techniques and other skills required for data collection. For example, in a cycle where qualitative data is the set methodological framework, you may be able to quickly carry out two or three qualitative methods, for example, a bi-polar survey, a Likert scale survey and a short questionnaire

(b) conduct a full enquiry using all six stages of the enquiry process that uses the set methodology for that cycle as the source of its primary data. WJEC recommends this second approach as the assessment may assess any part of the full enquiry process described on page 19 of the specification.

8 Will all of the questions in Parts A & B of Component 3 be about the learners' own experience of fieldwork?

No. Some questions will be about the learners' own experiences of fieldwork. However, the examination paper will also contain several sub-questions (or items) that assess the learners' ability to apply their understanding of fieldwork in a new geographical context. This is because the prime assessment objective weighting in the assessment of fieldwork is AO3. Indeed, Parts A & B of Component 3 do not contain any AO1 or AO2 questions.

For example, the sample assessment materials include questions about the methodology of measuring flows set in a coastal context and others set in an urban context. Learners will need to appreciate that the assessment requires them to apply their understanding of the enquiry process rather than of the context itself. So, during the consolidation phase, it would be sensible to discuss how the methodological approach used to frame the enquiry (or both enquiries) would be similar in at least one other context. This is a further reason to support the view that each fieldwork enquiry (remembering that each must take place in a contrasting environment) should include the same methodological approach (see Question 4), as this will provide a wider preparation for the examination itself.

The use of mathematics and statistics in geography

GCSE Geography is an excellent deliverer of numeracy across the curriculum. Students need to be familiar with the complete range of mathematical and statistical techniques that are listed in Appendix A on pages 27–28 of the specification. These include some skills of numeracy that may not be commonly used in geography classrooms at GCSE. A guide to some of these is given below.

2.1 Measures of central tendency, spread and cumulative frequency

Central tendency

Central tendency is a measure of where a number lies in comparison with other values in a set of data. A measure of central tendency is a value that attempts to describe a set of data by identifying the central value of that set. *For example, calculation of a mean from several readings of a river's velocity is a measure of central tendency.*

Measures of central tendency are useful for comparing two sets of data. *For example, the modal class of pebble sizes could be used to compare the sizes of two samples of pebbles taken from different sites on the same river.*

Central tendency is measured using mean, median or mode (modal class). The word average is often used as a generic term for all three measures of central tendency – although most people tend to equate average with mean.

Mean is the sum of all the values in a data set, divided by the number of values.

Median is the midpoint of a distribution. The same number of values is above and below the median value. When there is an even number of values, the median is the mean of the two middle values.

Mode is the most frequently occurring value in a data set. Frequency tables can be used to show the mode (or most popular value or group of values) of a set of data. Modal class is the most frequently occurring group of data in a data set.

Measures of spread

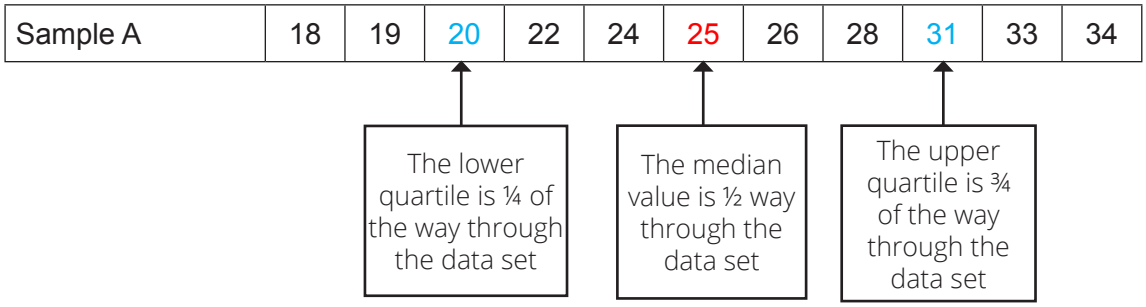
Measures of spread (or dispersion) describe how similar or varied the values are for a particular set of data. *For example, when investigating sizes of pebbles in a river, a measure of how similar or varied the sizes are within one sample.*

Measures of spread are also useful for comparing sets of data. *For example, when investigating pebbles which appear to have been sorted by longshore drift on a beach, a measure of how similar or varied the sizes are between contrasting samples at each end of the beach.*

Range is a measure of the spread of data values – it is the difference between the highest and lowest value in a data set.

Interquartile range is another measure of the spread of data. It can be found by drawing cumulative frequency diagrams which represent a 'running total' of the frequencies. On the diagram, draw horizontal lines to represent ¼, ½ and ¾ of the total frequency. Then read estimates of the lower quartile (¼), median (½) and upper quartile (¾) from the horizontal axis. The interquartile range is the difference between the lower and upper quartile.

In small data sets, the interquartile range can be found by putting the data set into rank order. *For example, interquartile range could be used to measure the degree of sorting in samples of pebbles taken from a beach or river:*



The interquartile range for sample A = upper quartile – lower quartile
= 31 – 20
= 11

2.2 Calculating percentage increase or decrease and understand the use of percentiles

Percentage increase or decrease can be used to describe a change in a variable. *For example, percentage increase or decrease in population over a period of time.* It can be calculated from values given in text, a table or read from a graph.

Percentiles indicate the value below which a given percentage of observations in a set of data fall. *For example, the 20th percentile of a data set of sizes of pebbles found in a river is the value below which 20% of the pebbles are found.*

Histograms can be used to illustrate grouped data that has been sorted into class intervals of equal width using bars to represent the data. The base of each bar, on the horizontal axis, represents each class interval and the height of the bar, on the vertical axis, represents the frequency of each class interval. The shape of a histogram can show if the data is normally distributed (symmetric about the central value and approximately bell shaped) or skewed (non-symmetric about the central value).

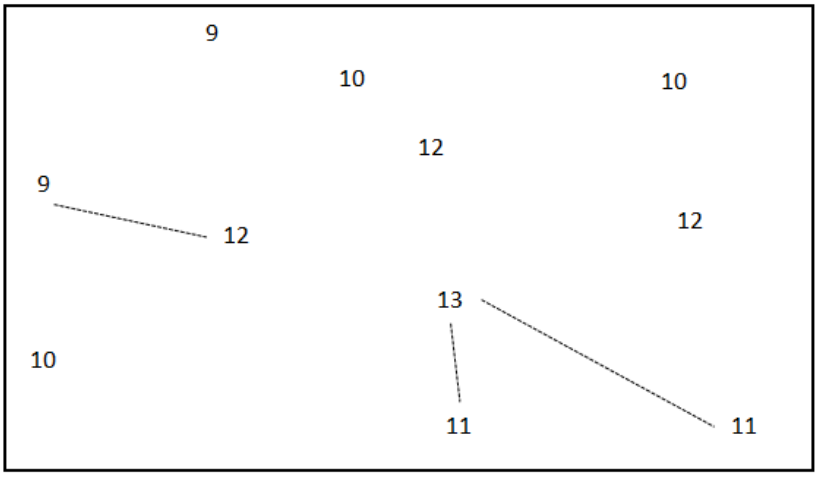
2.3 Describing relationships in bivariate data

Geography enquiries often look for the connection between two sets of data*. For example, is the infant mortality rate connected to a country's GNI?* Testing whether two sets of data are related can be done using a scatter graph, with one variable on each axis. The vertical axis should be used to plot the **dependent variable**. Variations within this data set depend on variations in the other data set. In this example, the dependent variable is infant mortality. The horizontal axis is used for the **independent variable**. In this example, the independent variable is GNI.

The plots can then be examined to see if there is positive, negative or no correlation. If there is correlation, a **line of best fit** can be drawn on the graph to represent the correlation. The line of best fit does not join up the scatter points, but simply follows their general trend. There should be the same number of scatter points on each side of the line of best fit.

To **interpolate** means to find values between given points in a data set. *For example, using a line graph which shows the population of a country in ten year intervals and using it to estimate values in between those years.*

Interpolation may be used to estimate a value on an isoline map. In the example below, values for temperature in a microclimate study of the school grounds have been plotted. The process of interpolation may be used to plot isotherms at two degree intervals. A line can be drawn between the locations at which a reading of 10° was recorded. All points along this line represent 10°. A second line can be drawn between the locations at which a reading of 12° was recorded. All points along this line represent 12°. Interpolation becomes necessary along each of the dotted lines shown on the map. For example, a temperature of 10° can be interpolated one third of the way along the dotted line between 9 and 12. Similarly a temperature of 12° can be interpolated one half of the way along the dotted line between 11 and 13.



To **extrapolate** means to project a trend forward in order to estimate a value. ***For example, use a line graph showing the population of a country, and extend it to estimate future population.***

2.4 Identifying weaknesses in statistical presentation of data

Learners should be aware of the strengths and weaknesses of the presentational techniques that are described on pages 27–28 of the specification. Some of these are suggested in Figure 7 – learners could be encouraged to extend this understanding.

Figure 7 *Strengths and weaknesses of data presentation techniques*

Technique	Strengths	Weaknesses
Bar charts	Simple to construct and read. Effective for showing discrete (non-continuous) data, for example, GNI in selected countries.	Can be difficult to represent data that covers a very large range.
Line graphs	Simple to construct and read. Effective for showing continuous data, for example, temperature readings on a climate chart.	Can be difficult to construct and read if values are large and the variation in data is relatively small and accuracy is required. Not suitable for discrete data.
Pie charts	Visually effective for representing percentages of the whole, and for making comparisons between two or more pie charts. Widely used so easily understood.	Difficult to read values from pie charts with accuracy. Not particularly effective when there are a large number of small sectors in each pie.
Scatter graphs	Visually effective for representing the relationships (correlations) in bivariate data where one variable is dependent on the other. Closeness of the scatter points to a line of best fit gives some visual indication of the degree of dependency (or strength of correlation) between the variables.	Can be difficult to determine whether relationships are positive or negative if the scatter points are not close to a line of best fit, or if each axis is significantly different in length. The strength of a suspected correlation cannot be measured without use of a statistical test (Spearman's Rank Correlation Coefficient).
Proportional circles	Useful technique for representing absolute data where there is a large range of values. Proportional pie charts are capable of representing both the absolute value of the whole and percentages. This makes them potentially more useful than pie charts for making comparisons.	Difficult to construct and read the scale for proportional circles. Not widely used so may be misunderstood by many.
Choropleths	Effective way of representing groups of data and their changing patterns over space, for example, GNI for different countries, or deprivation indicators across the wards of an urban area. The use of density shading is a visually effective technique to represent values.	Spatial patterns can be concealed if too few groups of data are chosen for the choropleth. Spatial patterns can be generalised if too few spatial areas are available to plot the choropleth. Choropleths conceal variations within the boundaries of each area of the map. Groupings can be made systematically where the data range is relatively small, or by percentiles where the data range is larger. This may not be clear to the reader.
Flow-line maps	Effective way of representing flow patterns over space, for example, flows of commuters or migrants.	Difficult to construct and read the scale for proportional arrows/flow lines.
Located bars/pie charts	Effective way of representing absolute values of discrete data (using located bars) or percentage data (using located pie charts) over space. May be combined with another cartographic technique such as a choropleth.	The position of the located symbol may obscure important data on the base map. Located bars may begin in one area of the map and end in another, creating confusion for the reader.

LINKS

Useful Interactive Resources

Eduqas > Geography > GCE /GCSE

Educational Resources > Geography