

GCSE



WJEC GCSE in GEOGRAPHY

APPROVED BY QUALIFICATIONS WALES

TEACHER HANDBOOK

Teaching from 2016

This Qualifications Wales regulated qualification is not available to centres in England.



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Aims of the WJEC GCSE Geography

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 GCSE Geography 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.

	Closed task	Framed enquiry	Independent enquiry
Questions	A task is presented. Questions are not explicit.	Enquiry questions are selected by teacher, 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 Progression through geographical enquiry (based on an idea presented by Margaret Roberts, former senior lecturer at Sheffield University)

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 (whether they be classroom based or fieldwork based) 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 200 marks available, 15 per cent (or 30 marks) will be an assessment of the recall of knowledge, whereas 35 per cent (or 70 marks) will be an assessment of the application of knowledge and understanding. Students will be better prepared for these 70 marks if they have been actively involved in framed enquiries.

Understanding the Assessment Objectives

The assessment objectives for WJEC GCSE Geography are:

AO1.1 Demonstrate knowledge of places, environments and processes at a variety of scales.

AO1.2 Demonstrate understanding of places, environments, concepts and interrelationships at a variety of scales.

AO2 Apply knowledge and understanding to interpret, analyse and evaluate geographical information and issues and to make judgements.

Question setters will apply elements of AO2 as follows:

Interpret means ascribing meaning to information, for example, the application of general knowledge and understanding of informal housing to ascribe meaning to a photograph of informal housing in a novel and unique context.

Analyse means deconstructing information and/or issues to find patterns, characteristics and connections to the candidate's wider geographical understanding. The candidate will articulate this through logical chains of reasoning.

Evaluate means weighing up (for example, strengths and limitations) information and/or drawing together (synthesising) disparate threads of an argument/issue.

Make judgements means making a decision and justifying it by applying wider geographical knowledge and understanding to the evidence available.

AO3 Select, adapt and use a variety of skills and techniques to investigate questions and issues and communicate findings.

Each full question within the sample assessment materials has a set assessment objective weighting. For example, question 1 in Unit 1 and Unit 2 will always be marked out of 28 and have 5 marks for AO1.1 and 9 marks for AO2. These weightings are shown in Figure 3.

	Unit 1			Unit 2		
	Q1	Q2	Q3/4	Q1	Q2	Q3/4
AO1.1	5	6	4	5	6	4
AO1.2	6	8	6	6	8	6
AO2	9	8	8	9	8	8
AO3	8	6	6	8	6	6
Accuracy		3			3	
Totals	28	31	24	28	31	24
TOTAL	83 (40%)			83 (40%)		

Figure 3 Assessment objective weightings in Units 1 and 2

Each sub-question (item) in the sample assessment materials targets one specific assessment objective. The following statements exemplify how each assessment objective is used.

Assessment objective 1.1 is used to target **knowledge** of aspects of subject content. As such, questions typically ask candidates to recall knowledge of locations, places, processes and environments at a variety of scales from local to global. Items tend to have low tariffs with a maximum of 4 marks. Questions may assess knowledge of key terms, such as the examples on page 6 of the sample assessment materials. One example of a 4 mark question can be seen on page 13 of the sample assessment materials, and its associated marking scheme on page 31, where knowledge of the process of migration is assessed.

Assessment objective 1.2 is used to target understanding of aspects of subject content. As such, questions typically ask candidates to demonstrate understanding of places, environments, concepts or interrelationships. Items in the sample assessment materials may be given a low tariff (2 or 4 marks) or require extended writing, in which case a tariff of 6 or 8 marks is given. One example of a low tariff question can be seen on page 6 of the sample assessment materials, and its associated marking scheme on page 26. A higher tariff (8 marks) example can be seen on page 52 of the sample assessment materials, and its associated marking scheme on page 75.

Assessment objective 2 is used to target **application** of knowledge and understanding. As such, questions that target AO2 require candidates to **apply** their wider geographical understanding of concepts, processes or interactions to a specific context provided by the stem of the question or stimulus material. This context will provide an opportunity to assess the candidates' ability to apply their knowledge and understanding to:

- tackle novel situations, by applying their prior knowledge and understanding to **interpret and analyse** information about a specific locality which is presented to them for the first time in the examination
- develop material beyond pure conceptual understanding when they develop lines of argument to **evaluate and make judgements** on a geographical problem or issue that is presented in the examination. For example, developing lines of argument that appraise advantages and disadvantages of a strategy, or that evaluates the sustainability of one or more options where an evaluation of advantages and disadvantages or sustainability is not clearly signalled in the specification
- synthesise links between different areas of knowledge and understanding, and apply this understanding to analyse novel information that requires a decision. Questions which require analysis and problem solving will naturally target all four elements of AO2.

A range of tariffs have been used to target AO2 in the sample assessment materials and these include questions that require extended writing. Some questions will ask candidates to ascribe meaning to a photograph taken in a context that will be novel to them. An example can be seen on page 14 of the sample assessment materials, and its associated marking scheme on page 32. Other questions require the analysis of information before a decision can be made. An example can be seen on page 21 of the sample assessment materials, and its associated marking scheme on page 37.

Suitable ways to target AO2 with your own students might be to use the following openings when posing questions during classroom activities:

1. Analyse the impacts on ...
2. Weigh up the advantages/disadvantages of ...
3. Discuss the points of view of ...
4. What are the limitations of ...?

5. To what extent do you agree?
6. Which is the best option?
7. Justify your decision/choice.
8. What are the costs and benefits?
9. How might things change in the future?
10. What might be the consequence?
11. What ought to happen ...?
12. Who should ...?

Assessment objective 3 is used to target **skills and techniques** in the investigation of questions and issues. Question setters will apply elements of AO3 as follows:

- (a) **Select** – skills/techniques will be assessed by questions that require candidates to either choose an appropriate mathematical and statistical technique to process/present information or justify their selection, or both.
- (b) **Adapt** – skills/techniques will be assessed by questions that require candidates to describe ways in which a mathematical/statistical technique could be adapted, for example, in order to add greater clarity to the representation.
- (c) **Use** – skills/techniques will be assessed by questions that require candidates to use mathematical/ statistical techniques to interpret a map/graph, process information from a table, or present data graphically or cartographically. The full list of mathematical and statistical skills that will be assessed over a number of consecutive exam series is given in Appendix A on page 33–34 in the specification. For example, candidates may be asked to:
 - interpret patterns, trends, correlations, or relationships shown on a variety of maps and graphs
 - calculate mean, IQR, or mode in tables of data
 - complete maps or graphs
 - use scale and grid references on OS maps
 - draw or interpret cross-sections.

Communicate findings will be assessed in questions targeting AO3 that require longer responses. In such questions, examiners will make judgements about the coherence and quality of written communication and the correct use of geographical vocabulary where appropriate.

Assessing Writing

The quality of writing will be assessed through two separate strands:

- (i) Communicating and organising
- (ii) Writing accurately.

- (i) **Communicating and organising** will be assessed in items that have a tariff of 6, 8 or 10. The definitions below clarify what is meant by the terminology in the descriptors used in the sample assessment materials.

Meaning – to have clarity the text must be legible. The meaning of statements should be clear and not require rereading to make sense.

Purpose – the response should take into account what is required by the question. For example, evaluation requires consideration of pros/cons or the justification of a decision may be assisted by arguments. A suitable tone is adopted for reporting on scientific investigation in Unit 3.

Structure – well-planned responses have an overall structure with use of paragraphs to indicate portions of the response such as introduction, main arguments and conclusion. Chains of reasoning provide a logical structure within paragraphs. Signposting links sections together and is used to assist the reader.

- (ii) **Writing accurately** takes into account the candidate's use of specialist language. It also takes into account the accuracy of the candidate's spelling, punctuation and grammar. This assessment is restricted to specific items (one item in each unit). The descriptors for writing accurately are printed in the mark scheme for each relevant item. In applying these descriptors, learners may only receive marks for responses that are in the context of the demands of the question; that is, where learners have made a genuine attempt to answer the question.

Developing programmes of study for WJEC GCSE Geography

WJEC is aware that schools in Wales have various amounts of curriculum time in which to deliver GCSE Geography. Some schools use a two week timetable (two hours in one week and three hours in the other week) and deliver the course over two years. If no curriculum time were lost, this would equate to about 160 Guided Learning Hours (GLH). In reality, of course, some time is lost due to mock examinations, work experience etc., so this is probably nearer to 140 GLH. Some schools begin delivery of their GCSEs in the summer term of Year 9 which creates an extra 28 GLH.

WJEC recognises that the responsibility for planning the delivery of the specification is very much down to individual geography departments. As such, the ideas that follow are only suggestions. They are provided so that subject leaders have some guidance on the number of hours that might be spent delivering each key idea without running out of time.

Some basic maths to divide up the specification

The following table represents the amount of time you might spend on each theme depending on the total amount of curriculum time you have available.

School A has two hours per week and delivers the specification over two years (five terms) so has around 120 GLH.

School B has five hours per fortnight and delivers the specification over two years so has around 140 GLH.

School C has five hours per fortnight and starts delivery of the specification in the summer term of Year 9 (six terms) so has around 168 GLH.

Units 1 and 2 are each worth 40% of the assessment package. Unit 3 (NEA on fieldwork) is worth 20% of the overall assessment package. The following timings have been roughly based on these pro rata weightings. In each example in Figure 4, it has been assumed that fieldwork has been added to Theme 1 and Theme 2.

	School A (120 GLH)	School B (140 GLH)	School C (168 GLH)
Theme 1	28	32	39
Theme 2	28	32	39
Theme 3/4	12	15	17
Theme 5	20	23	28
Theme 6	20	23	28
Theme 7/8	12	15	17
Total	120	140	168

Figure 4 Recommended number of hours per theme

Example Programme of Study 1

The first exemplar Programme of Study is based on a school that has two hours per week (120 Guided Learning Hours of curriculum time) at GCSE. However, they begin their GCSE in the summer term of Year 9 which creates an additional 28 hours of study time.

Themes have been mixed up so that students in each year group get a variety of physical and human geography. The UK and developing world place studies are also mixed up.

Term	Approx hours	Theme
Summer Y9	26	Theme 3 Theme 5 Key Idea 5.1
Autumn Y10	28	Theme 5 Key Ideas 5.2, 5.3 and 5.4
Spring Y10	22	Theme 2 Key Ideas 2.1 and 2.2 Rural/urban fieldwork
Summer Y10	26	Theme 2 Key Idea 2.3 and Theme 6 Key Ideas 6.2 and 6.3
Autumn Y11	28	Theme 1 Rivers/coastal fieldwork
Spring Y11	22	Theme 6 Key Ideas 6.1 and 6.4 Theme 7

Example Programme of Study 2

The second exemplar Programme of Study is based on a school that has 140 Guided Learning Hours of curriculum time at GCSE which is delivered over two years. This represents the average amount of time in which GCSE Geography in Wales seems to be delivered.

In this example, the school has opted for Options 4 and 7.

Programme of Study for Year 10 (80 hours)

Content from the specification has been re-structured, so that most of the UK geography is delivered in Year 10 allowing the school to deliver **two** opportunities for fieldwork in contrasting environments during this year.

Key questions	Commentary	Hours
1.1.1	Distinctive landscapes in Wales	5
1.1.2	<p>Learners need to understand the difference between the wider landscape and the smaller elements within it, which include landforms. The focus of this could be for learners to develop their understanding of place and its unique qualities. A more detailed understanding of landforms and processes is required later, so it is important to keep this introduction brief. Schools are encouraged to upload images of their local landscape to the Distinctive Landscapes website.</p> <p>For many schools this may be a very short overview of the landscapes of Wales, for example, areas of upland, lowland, major rivers etc., followed by a brief consideration of one smaller geographical area which could be local to the school. The same area could be used when teaching about either river or coastal landforms later.</p> <p>Some schools could use this as an opportunity for fieldwork into leisure use and management – exploring concepts of honeypots and carrying capacity.</p> <p>Distinctive Landscapes of the UK This website allows your centre to submit photographs of the urban or physical landscape of your school's local area. As more centres submit photographs we will build a photographic resource for teaching about landscapes that will be searchable by both key word and/or map location. Taking the photographs will allow your students to engage with the geographical concept of place and provide opportunities for your students to discuss which landscape elements make the local area distinctive.</p>	
1.1.3		

1.2.1(river)	River processes and change	5
1.2.2(river)	<p>Learners must study examples of landforms that are located in Wales. Learners will need to understand the key processes that are responsible for river landforms listed in the specification.</p> <p>When studying the factors that affect rates of landform change required by key question 1.2.2, they may study examples from Wales or elsewhere in the UK. For example, to illustrate seasonal variation in discharge learners could study the Somerset Levels floods of 2014.</p>	
5.2.2	Weather and climate of the UK	5
	A short unit to support the understanding of flooding that follows, and potentially allow a micro-climate study for schools that want to teach fieldwork related to weather.	
1.3.1	Flooding and river management	8
1.3.2	Learners must understand the movement of water through the drainage basin and be able to analyse hydrographs.	
1.3.3	Examples of river management can be from within Wales (for example, the management of the Afon Wnion at Dolgellau) or elsewhere in the UK (for example, the dredging of the River Tone in the Somerset Levels).	
2.1.1	Urban-rural change in Wales and the UK	12
2.1.2	Examples for Key Idea 2.1 must be taken from within Wales, whereas examples for Key Idea 2.2 may be taken from Wales or elsewhere in the UK.	
2.2.1		
2.2.2	This topic provides many opportunities for fieldwork and study of the area that is local to the school.	
2.2.3	Concepts such as place, sustainable communities and sphere of influence are key to understanding the issues presented here. Learners should be given the opportunity to develop a deeper understanding of sustainability by the application of Egan's Wheel.	
	Human geography fieldwork	8
	<p>This school chooses to provide an opportunity for fieldwork in a retail context focussing, for example, on one of the following:</p> <ul style="list-style-type: none"> • the quality of the high street retail environment • identity/place through a 'clone-town' study • retail location and change. 	

1.2.1 (coast)	Coastal process and change	5
1.2.2 (coast)	<p>Learners must study examples of coastal landforms that are located in Wales. Learners will need to understand the key processes that are responsible for coastal landforms listed in the specification.</p> <p>When studying the factors that affect rates of landform change required by key question 1.2.2, they may study examples from Wales or elsewhere in the UK. For example, to illustrate rapid rates of erosion learners could study the North Sea Coast of England.</p>	
5.3.2	Sand dune ecosystems	4
	A short topic on sand dune ecosystems to link with coastal deposition.	
	Physical geography fieldwork	8
	This school uses sand dunes as an opportunity for fieldwork – using transects to investigate succession through a sand dune ecosystem and/or the success of a management scheme.	
5.2.1	Extreme weather	6
	Linking atmospheric circulation to pressure systems – cyclones and drought. Study of cyclones will support the following coastal management topic.	
4.1.1	Coastal management	14
4.2.1	<p>Examples for this theme may be taken from anywhere in the UK and/or abroad. Time could be saved by choosing overlapping examples from both key question 1.2.2 and key question 4.2.2. For example, the East Riding of Yorkshire (Holderness) or North Norfolk could be used for both. A global dimension will be achieved by looking at vulnerability of communities in the Low Elevation Coastal Zone (LECZ), for example, on deltas such as the Ganges or Niger. The topic could end with a study of coastal barrages (such as the proposed tidal barrage at Swansea) to cover key question 5.4.1.</p>	
4.2.2		
5.4.1		

Programme of Study for Year 11 (60 hours)

The programme of study in Year 11 takes a global view.

Key questions	Commentary	Hours
5.1.1	Climate change	6
5.1.2	<p>The core content of the specification focuses entirely on the evidence for climate change and the causes of climate change. There is no need to consider impacts (as these are required by optional Theme 8), so this topic may be delivered quite quickly. The global scale of this topic is also followed in the ecosystem and inequality topics that follow.</p>	

5.3.1	Ecosystems	10
5.3.2	Learners must study the tropical rainforest ecosystem and one other biome, for example:	
5.4.2	<ul style="list-style-type: none"> • Tropical coasts (mangroves and coral reefs) – affected by development of tourism and overfishing 	
5.4.3	<ul style="list-style-type: none"> • Savanna ecosystem – affected by poor land use/farming which results in land degradation/desertification • Tundra – affected by oil/gas exploration and climate change. 	
2.3.1	Global Cities	8
2.3.2	A study of two global cities, i.e. cities that are connected by the process of globalisation to cities in other parts of the world through trade, finance, the media or flows of people. Learners should	
2.3.3	<p>develop an understanding of the regional and national context of each city. Therefore, it would be sensible to choose cities that are located in the same countries used in the study of Theme 6 or a UK global city such as Cardiff.</p> <p>For example, Mumbai could be chosen as a global city, and India used as the NIC in Theme 6. Alternatively, schools could choose Johannesburg as their global city and South Africa as their chosen NIC.</p>	
6.1.1	Global inequalities	8
6.2.1	Key Idea 6.1 should be a brief introduction. The Gapminder website created by Hans Rosling provides suitable video clips and is an	
6.2.2	<p>excellent source of up-to-date development data.</p> <p>Careful choice of MNC will allow links to be made between Wales/UK and the selected NIC. For example, TATA which has plants in Wales, England and India.</p>	
6.4.1	Regional development	6
6.4.2	To consolidate learning of place, it would be sensible to provide a brief overview of regional inequality within the same country as was	
6.4.3	<p>chosen for economic development topic, for example, India or South Africa.</p> <p>The UK North/South divide (key question 6.4.2) is related to key question 2.2.1, so could be taught earlier.</p> <p>Study of one major infrastructure project which could be:</p> <ul style="list-style-type: none"> • Integrated transport system for Cardiff and South Wales Valleys • Newport relief road • HS2. 	

6.3.1	Water resources and management	8
6.3.2	<p>It would be possible to reduce the number of different place studies by using Lesotho/South Africa, or Indian examples of water management projects at a variety of scales. For example:</p> <p>Micro-scale – fog harvesting</p> <p>Regional scale – water transfer schemes such as Lesotho to Johannesburg.</p>	
7.1.1	Social development	14
7.2.1	The indicators should be examined briefly before going into more depth in key question 7.2.1.	
7.2.2	To keep the number of place studies to a minimum, schools could focus on places that have been used elsewhere in the programme of study such as India and South Africa. Other useful examples of health and education issues can be found in countries such as Kenya and Malawi.	

Introduction to Unit 3

WJEC had three main aims when developing Unit 3:

- That centres would offer quality fieldwork opportunities to engage learners in the **whole** enquiry process. These opportunities need to be embedded in the teaching and learning programme
- For all learners to move towards independent fieldwork while being supported in a teacher designed framework. This will allow progression towards A level fieldwork
- For learners to relate the unique experiences of local scale fieldwork to their wider understanding of broad geographical concepts.

In order to prepare for Unit 3, learners should:

- experience fieldwork in **two** contrasting environments (one physical and one human) that are outside the school grounds
- experience teaching and learning that covers the whole enquiry process described on page 23 of the specification
- have time to prepare for and consolidate their learning. WJEC recommends that, if you are teaching with the minimum 120 Guided Learning Hours for the whole GCSE, preparation and consolidation for fieldwork occupy about 18 hours in total.

The enquiry process

In Unit 3, learners will be assessed on their ability to apply knowledge and understanding of the **whole** enquiry process, described on page 23 of the specification, to two contrasting fieldwork experiences. It is important to engage learners with each of the six stages of the enquiry process (shown in Figure 5), as assessment will focus on more than one of these stages.

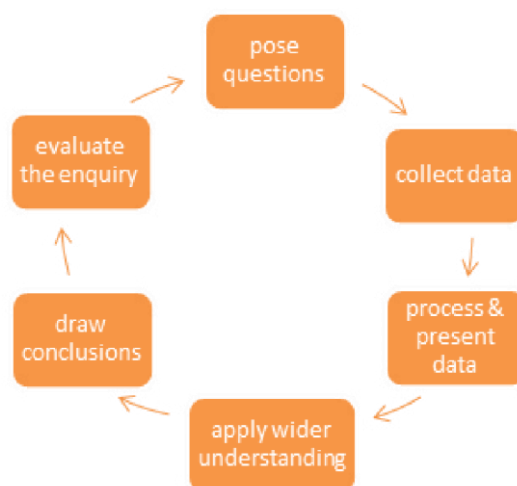


Figure 5 The cyclical nature of the enquiry process means that evaluation of the first fieldwork experience should help inform the development of the second fieldwork experience

Approaches to fieldwork

Learners must be given the opportunity to experience fieldwork in **two** contrasting environments (one physical and one human) that are outside the school grounds.

In at least one of these fieldwork enquiries, learners should incorporate a specific methodological approach (such as the use of transects) to their fieldwork. It is up to teachers who are designing the fieldwork to decide whether this methodological approach is used in one or both fieldworks. Clearly there is an advantage in adopting the same methodology on both occasions, as learners will have the opportunity to consider the strengths and limitations of this approach and demonstrate progression by applying their understanding during the second fieldwork. In addition, at least one fieldwork enquiry must investigate a specific geographical concept.

WJEC will publish the set methodological approach and the set conceptual framework for fieldwork at least two years in advance of Year 11 taking their award. The methodological approaches are described on page 25 of the specification. The conceptual frameworks are described on pages 26–27 of the specification. Each is illustrated with possible examples of fieldwork enquiries located in various human and physical environments. Further teacher guidance on the set approaches will be published annually on the WJEC website. A summary of the approaches to fieldwork is given in Figure 6.

Methodological approaches	Conceptual frameworks
Use of transects	Place
Change over time	Sphere of influence
Qualitative surveys	Cycles and flows
Geographical flows	Mitigating risk
	Sustainability
	Inequality

Figure 6 Summary of the WJEC set approaches to fieldwork

The sample assessment materials illustrate a year in which the set methodology is use of **transects** and the set conceptual framework is **inequality**.

One way to approach GCSE fieldwork in the new specification is to design one enquiry that incorporates all four methodologies. WJEC recognises that many geography teachers in Wales enjoy fieldwork set in the context of a river, and enquiries that investigate downstream changes are particularly popular. So, it would be possible to design a full enquiry (based on the six stages of the enquiry process on page 23 of the specification) into downstream changes that:

- includes the use of transects to create cross-sectional profiles of the river bed, or which uses transects across a point bar to collect sediment samples
- measures the flow of the river
- uses a qualitative technique (such as environmental quality index or the annotation of field sketches or photographs).

If the enquiry is repeated in subsequent years, and data is kept from one year to the next, then change over time can also be examined by comparing primary data to historic records of data collected by the school. Change over time can also be investigated using historic photographs or maps.

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 qualitative data, for example, use of closed and open questions, Likert scale or bi-polar techniques.
- 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.

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 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 GCSE Geography

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. 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.

3. I understand that I have to focus on a set methodology (in the first cycle, this will involve the collection of qualitative data). 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 23 of the specification). One of these is evaluation (stage six), so WJEC recommends that you use qualitative data (in the first cycle) in the second field trip too 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.

4. 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 23 of the specification) during their NEA report, which will be written during the second part of the autumn term of Year 11. 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. The assessment of fieldwork is worth 20% of the total assessment package. 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 about 20% of the total 120 Guided Learning Hours for the whole qualification.

5. 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 during Phase 1 of the NEA (Phase 1 is described on page 29 of the specification). However, this is not essential. A fieldwork portfolio could 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 field trip
- 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 Phase 2, or whether a more process-driven portfolio is the better model.

6. Does the first fieldwork just focus on methodology? 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 by the methodology. If so, 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 qualitative data 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 23 of the specification.

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 33–34 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

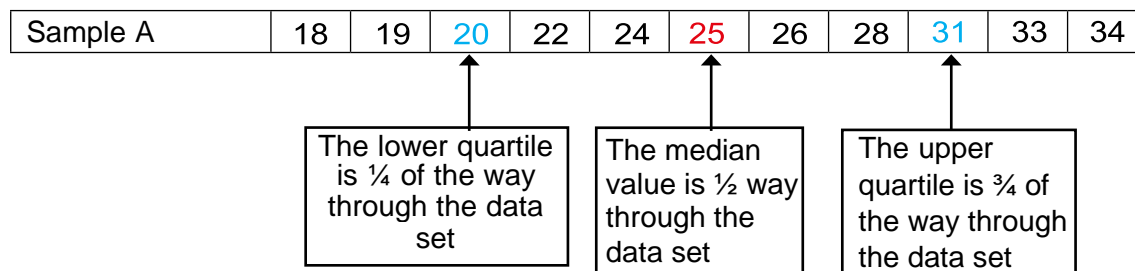
Measures of spread (or dispersion) describe how similar or varied the values are for a particular set of data. *For example, when investigating sizes of pebbles in a river, a measure of how similar or varied the sizes are within one sample.*

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 $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of the total frequency. Then read estimates of the lower quartile ($\frac{1}{4}$), median ($\frac{1}{2}$) and upper quartile ($\frac{3}{4}$) 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).

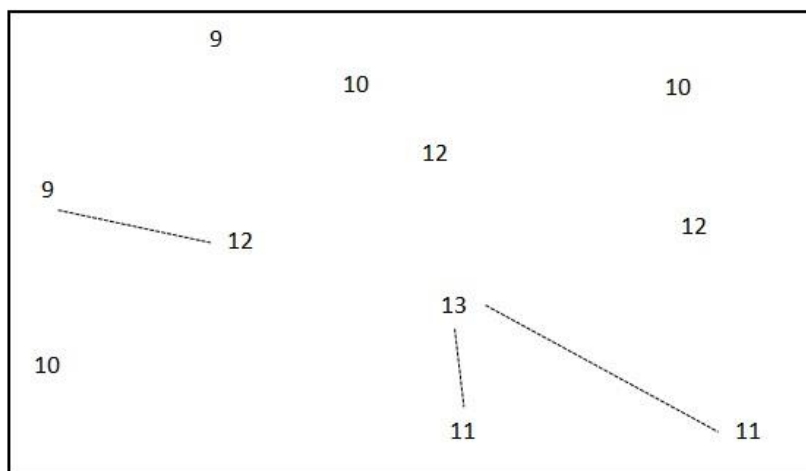
2.3 Describing relationships in bivariate data

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.

Useful Interactive Resources

WJEC > Geography > GCSE

Educational Resources > Geography

Distinctive Landscapes of the UK