GCE AS/A LEVEL

WJEC GCE AS/A LEVEL in GEOGRAPHY

APPROVED BY QUALIFICATIONS WALES

SPECIFICATION

Teaching from 2016

For award from 2017 (AS)
For award from 2018 (A level)

Version 2 March 2019

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

SUMMARY OF AMENDMENTS

Version	Description	Page number
2	'Making entries' section has been amended to clarify resit rules and the carry forward of NEA marks.	52

WJEC GCE AS and A LEVEL in GEOGRAPHY

For teaching from 2016
For AS award from 2017
For A level award from 2018

This specification meets the GCE AS and A Level Qualification Principles which set out the requirements for all new or revised GCE specifications developed to be taught in Wales from September 2016.

GCE AS and A LEVEL GEOGRAPHY (Wales)
SUMMARY OF ASSESSMENT

This specification is divided into a total of 5 units, 2 AS units and 3 A2 units. Weightings noted below are expressed in terms of the full A level qualification.

AS (2 units)

AS Unit 1: Changing Landscapes Written examination: 2 hours 24% of qualification — 96 marks
Section A: Changing Landscapes Choice between two themes, **either** Coastal **or** Glaciated Landscapes; two compulsory structured questions with data response **Section B: Tectonic Hazards** Three compulsory structured questions with data response

AS Unit 2: Changing Places Written examination: 1 hour 30 minutes 16% of qualification — 64 marks
Section A: Changing Places Two compulsory structured questions with data response **Section B: Fieldwork Investigation in Physical and Human Geography** Three compulsory structured questions with data response on fieldwork and the learner's own fieldwork investigation

A Level (the above plus a further 3 units)

A2 Unit 3: Global Systems and Global Governance Written examination: 2 hours 24% of qualification — 96 marks
Section A: Global Systems Water and Carbon Cycles: two compulsory structured questions with data response and one extended response question **Section B: Global Governance: Change and Challenges** Processes and patterns of global migration and global governance of the Earth's oceans: two compulsory structured questions with data response and one extended response question **Section C: 21st Century Challenges** One compulsory extended response question drawing on Units 1, 2 and 3 with resource material

A2 Unit 4: Contemporary Themes in Geography Written examination: 2 hours 16% of qualification — 64 marks
Section A: Tectonic Hazards One compulsory extended response question **Section B: Contemporary Themes in Geography** Select two optional themes from four: • Ecosystems • Economic Growth and Challenge: India or China or Development in Sub-Saharan Africa • Energy Challenges and Dilemmas • Weather and Climate Two essay questions, one on each chosen theme
A2 Unit 5: Independent Investigation Non-exam assessment: 3000 – 4000 words 20% of qualification — 80 marks
One written independent investigation, based on the collection of both primary data and secondary information

This is a unitised specification which allows for an element of staged assessment. Assessment opportunities will be available in the summer assessment period each year, until the end of the life of the specification.

Unit 1 and Unit 2 will be available in 2017 (and each year thereafter) and the AS qualification will be awarded for the first time in summer 2017.

Unit 3, Unit 4 and Unit 5 will be available in 2018 (and each year thereafter) and the A level qualification will be awarded for the first time in summer 2018.

Qualification Number listed on The Register:
GCE AS: 601/8484/X
GCE A level: 601/8455/3

Qualifications Wales Approval Number listed on QiW:
GCE AS: C00/0791/8
GCE A level: C00/0780/7

GCE AS and A LEVEL GEOGRAPHY

1 INTRODUCTION

1.1 Aims and objectives

The WJEC GCE AS and A level in Geography encourages learners to apply geographical knowledge, theory and skills to the world around them. In turn this will enable learners to develop a critical understanding of the world's people, places and environments in the 21st Century. Learners should be able to develop both knowledge and understanding of contemporary geographical concepts together with transferable skills that will enable them to progress to higher education and a range of employment opportunities.

The focus of the specification is to develop an enthusiasm for and competence in geography by using contemporary real-world contexts, from a range of specified spatial scales, and through engagement with and practical application of geographical skills and techniques in the field. This specification draws on both physical and human geography, explores people-environment interactions and encourages development of fieldwork at the local level to enable learners to pose enquiry questions.

The specification covers the required subject content at an appropriate level of rigour and challenge for a GCE A level qualification. The content is organised into the required core and non-core themes. At AS the non-core content is presented as one compulsory theme and at A2 as one compulsory theme and a series of optional themes based on contemporary issues in geography. These non-core themes allow for rigour and in-depth treatment and also provide flexibility for teachers to select themes to develop a course of study suited both to their and their candidates' interests and circumstances. The specialised concepts and geographical skills (quantitative and qualitative skills and approaches) as noted below in the aims and objectives are embedded in the core and non-core content.

The WJEC AS and A level in Geography requires learners to:

- develop their knowledge of locations, places, processes and environments, at all geographical scales from local to global across the specification as a whole
- develop an in-depth understanding of the selected core and non-core processes in physical and human geography at a range of temporal and spatial scales, and of the concepts which illuminate their significance in a range of locational contexts
- recognise and be able to analyse the complexity of people-environment interactions at all geographical scales, and appreciate how these underpin understanding of some of the key issues facing the world today

- develop their understanding of, and ability to apply, the concepts of place, space, scale and environment, that underpin both the national curriculum and GCSE, including developing a more nuanced understanding of these concepts
- gain understanding of **specialised concepts** relevant to the core and non-core content. These must include the concepts of causality, equilibrium, feedback, identity, inequality, interdependence, globalisation, mitigation and adaptation, representation, risk, resilience, sustainability, systems and thresholds
- improve their understanding of the ways in which values, attitudes and circumstances have an impact on the relationships between people, place and environment, and develop the knowledge and ability to engage, as citizens, with the questions and issues arising
- become confident and competent in selecting, using and evaluating a range of **quantitative and qualitative skills and approaches**, (including observing, collecting and analysing geo-located data) and applying them as an integral part of their studies
- understand the fundamental role of fieldwork as a tool to understand and generate new knowledge about the real world, and become skilled at planning, undertaking and evaluating fieldwork in appropriate situations
- apply geographical knowledge, understanding, skills and approaches in a rigorous way to a range of geographical questions and issues, including those identified in fieldwork, recognising both the contributions and limitations of geography
- develop as critical and reflective learners, able to articulate opinions, suggest relevant new ideas and provide evidenced argument in a range of situations.

1.2 Prior learning and progression

There are no prior learning requirements. Any requirements set for entry to a course following this specification are at the discretion of centres. It is reasonable to assume that many learners will have achieved qualifications equivalent to Level 2 at KS4. Skills in Numeracy/Mathematics, Literacy/English and Information Communication Technology will provide a good basis for progression to this Level 3 qualification.

This specification builds on the knowledge, understanding and skills established at GCSE and particularly aims to develop a deeper understanding of, and ability to apply, the concepts of place, space, scale and environment. Some learners may have already gained knowledge, understanding and skills through their study of geography at GCSE.

This specification provides a suitable foundation for the study of geography or a related area through a range of higher education courses, progression to the next level of vocational qualifications or employment. In addition, the specification provides a coherent, satisfying and worthwhile course of study for learners who do not progress to further study in this subject.

This specification is not age specific and, as such, provides opportunities for learners to extend their life-long learning.

1.3 Equality and fair access

This specification may be followed by any learner, irrespective of gender, ethnic, religious or cultural background. It has been designed to avoid, where possible, features that could, without justification, make it more difficult for a learner to achieve because they have a particular protected characteristic.

The protected characteristics under the Equality Act 2010 are age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex and sexual orientation.

The specification has been discussed with groups who represent the interests of a diverse range of learners, and the specification will be kept under review.

Reasonable adjustments are made for certain learners in order to enable them to access the assessments (e.g. candidates are allowed access to a Sign Language Interpreter, using British Sign Language). Information on reasonable adjustments is found in the following document from the Joint Council for Qualifications (JCQ): *Access Arrangements and Reasonable Adjustments: General and Vocational Qualifications.*

This document is available on the JCQ website (www.jcq.org.uk). As a consequence of provision for reasonable adjustments, very few learners will have a complete barrier to any part of the assessment.

1.4 Welsh Baccalaureate

In following this specification, learners should be given opportunities, where appropriate, to develop the skills that are being assessed through the Skills Challenge Certificate within the Welsh Baccalaureate:

- Literacy
- Numeracy
- Digital Literacy
- Critical Thinking and Problem Solving
- Planning and Organisation
- Creativity and Innovation
- Personal Effectiveness.

1.5 Welsh perspective

In following this specification, learners should be given opportunities, where appropriate, to consider a Welsh perspective if the opportunity arises naturally from the subject matter and if its inclusion would enrich learners' understanding of the world around them as citizens of Wales as well as the UK, Europe and the world. Within this specification examples and case studies used for study should be set within Wales for Units 1 and 2 Changing Landscapes and Changing Places to give a Welsh context and Welsh perspective. Centres are encouraged to bring the context of Wales and the Welsh perspective into Unit 3 on Global Systems and Global Governance and Unit 4 Contemporary Themes in Geography as appropriate.

2 SUBJECT CONTENT

The subject content focuses on the dynamic nature of physical systems and processes in the real world, and on the interactions and connectivity between people, places and environments in both time and space. The core themes are divided into separate physical and human themes. The non-core content draws on both physical and human geography and also people-environment interactions. All themes integrate geographical skills, scale and specialised concepts. Appendix A lists the geographical skills relevant to this specification and identifies where these skills can be integrated.

Unit 1, Changing Landscapes, has three sections. In the first, learners will develop knowledge and understanding of physical geography, primarily at the local level, although wider scales are addressed where appropriate to the context. In the second section, learners will develop in-depth knowledge of Tectonic Hazards through study of selected physical and human processes, their linkages and the inter-relationships between people and environment. In the third section, Section C, the assessment will focus on application of knowledge and understanding to draw together elements from across the course.

In Unit 2, Changing Places, learners will develop knowledge and understanding of human geography in the first section, primarily at the local level, although wider scales are addressed where appropriate to the context. In the second section the focus is on fieldwork opportunities related to Changing Landscapes and Changing Places as the content of both provides a range of opportunities for physical and human geography fieldwork. The learner's own physical and human fieldwork investigations as well as general physical and human fieldwork skills will be assessed in this unit.

In order to fulfil these AS fieldwork investigations, fieldwork must be integrated into study. The fieldwork must cover both physical geography fieldwork and human geography fieldwork, and be undertaken through the equivalent of at least two days. Centres must verify that the required fieldwork has taken place. For learners to be able to apply their geographical skills, the specification focuses on the six-stage enquiry method for fieldwork investigations, which ranges from setting a research question to collecting and analysing data and producing written work on the stages of their investigation. Appendix C lists suggested opportunities for fieldwork to provide possible starting points.

In Unit 3 learners will develop knowledge and understanding of core content at the global level and in the third section the assessment will require application of knowledge and understanding to draw together elements from across the course.

In Unit 4 learners will develop a critical understanding and in-depth knowledge of selected non-core physical and human processes, their linkages and the inter-relationships between people and environment.

In order to fulfil fieldwork investigations at A2, fieldwork must be integrated into study. The fieldwork must cover both physical geography fieldwork and human geography fieldwork, and be undertaken through the equivalent of at least two days. In total learners undertake the equivalent of at least four days of fieldwork over the AS and A2 course. The fieldwork must be used to build a foundation for the non-exam assessment. The non-exam assessment is addressed in Unit 5 and consists of an independent investigation; it requires reflective, extended written research, based on an independently selected research question linked to the specification. Appendix C lists suggested opportunities for fieldwork to provide possible starting points.

Within the specification an introduction to each theme is followed by the required knowledge and understanding, which is set out in two columns. The focus of study is presented in the first column, with amplification of the geographical content in the second column. There is no hierarchy implied by the order in which the content is presented in each theme, but it reflects the order in which it will appear in the assessment.

The introduction to each theme presents a rationale of the content and details the specialised concepts central to each theme. The rationale will not be assessed. However, the assessment actively requires learners to demonstrate understanding of the specialised concepts. Knowledge and understanding of the specialised concepts helps learners to develop as critical and reflective learners with the capability to analyse, interpret and evaluate key geographical information and issues; this enables learners to think like geographers.

Examples and case studies selected for study by centres to exemplify the content must be contemporary, that is within the last two decades, unless an historical context is useful for a time dimension, which also informs the present context. Specifically examples and case studies used for study should be set within Wales for Units 1 and 2, Changing Landscapes and Changing Places. Centres are encouraged to bring the Wales context into Unit 3 on Global Systems and Global Governance and Unit 4, Contemporary Themes in Geography, as appropriate. Case studies and examples are not listed throughout this specification; instead learners are expected to demonstrate independent learning through the selection of examples and case studies. These examples and case studies should enable learners to develop knowledge and understanding of place, context and scale to reinforce the specialised concepts. Where case studies and examples are specified this is to highlight a context appropriate to the content.

2a. The place of fieldwork in the specification

Geographical fieldwork is defined as applying specific geographical knowledge, understanding and skills to a particular and real out-of-classroom context. In total, the equivalent of at least of two days of geographical fieldwork must be undertaken as required in the subject content at AS and a further two days at A level, making a total of the equivalent of a least four days. At AS and A2 the fieldwork must be based on both physical geography and human geographical processes and spread across the course.

Overall, this fieldwork will enable learners to develop:

- the required geographical skills including the collection of field data
- the required knowledge and understanding of the six stages of enquiry process central to this specification (as below), which will underpin the requirements in Unit 5, the independent investigation. The independent investigation may be based on either the human or physical geography themes in Units 1, 2 and 3 or the optional themes in Unit 4.

One or more of these fieldwork days must directly provide the starting point for the independent investigation in Unit 5, as shown in the diagram below.

<table>
<tr><th>AS</th><th colspan="2">A Level</th></tr>
<tr><td>Two days equivalent on physical and human geography fieldwork collecting field / primary data and developing geographical skills; assessed in Unit 2</td><td>Two days equivalent on physical and human geography fieldwork collecting field / primary data and developing geographical skills, which can lead into and contribute to Unit 5, as below</td><td>A further study may be chosen linked to another fieldwork investigation, which must include field / primary data</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">Unit 5: A Level non exam assessment
Independent investigation</td></tr>
</table>

A suitable starting point for the fieldwork is in studying Unit 1, Changing Landscapes with either coastal or glaciated landscapes and Unit 2, Changing Places. In each the focus is at the local scale, which is appropriate for fieldwork. Appendix C lists specific opportunities to develop appropriate fieldwork. Geographical skills appropriate to fieldwork should be selected from Appendix A.

The six stages of the enquiry process

The enquiry process forms the framework for application of the fieldwork and geographical skills. Knowledge and understanding of the six stages will be developed overall through the fieldwork and each of the days undertaken may focus on some of the aspects of the six stages; that is all the geographical skills involved in the enquiry process need not be undertaken on the fieldwork days. The aim should be to build by the end of the four days of fieldwork a holistic understanding of the six stages.

Sequence and enquiry questions	**Geographical skills**
1. Context and planning – what is the geographical enquiry process?	Prepare to investigate a geographical question in the field; make and justify decisions on the task including data collection methods and how to use them; define and refine the research question(s) that underpin the context of the field investigation; risk and ethical issues
2. Data collection – how is data and information (evidence) collected?	Acquire field data (primary) and relevant literature (secondary data / information) pertinent to the research question; observe and record in the field and understand the theory / context for the research question, using quantitative and qualitative methods and primary and secondary data / information
3. Presentation and display – how is the collected data and information presented?	Process a range of field and any relevant secondary data / information using quantitative and qualitative methods in order to lead to appropriate analysis
4. Analysis and interpretation of findings – how can the evidence be analysed?	Interrogate (interpret and analyse) data / information from field (primary) sources and, as relevant, secondary data / information; describe patterns, trends, relationships; apply knowledge and understanding of geographical knowledge, concepts and processes and theory to specific evidence collected to understand field observations
5. Conclusion – what conclusions can be drawn and how do these relate to the initial aim of the enquiry?	Synthesise findings to draw conclusions based on evidence and theoretical research
6. Evaluation of the whole investigation – what evaluative techniques should be applied to the enquiry process?	Critically reflect on every stage of the whole investigation in order to appreciate the strengths and limitations of the primary and secondary data, links to original question*;* note strengths and limitations (accuracy, validity and reliability) and anomalies and / or errors or misuse of data; evaluate the methodology including, if relevant, sampling techniques; suggest improvements for further research

To prepare for each of their fieldwork activities, learners should be given opportunities to:

- pose geographical questions
- consider appropriate data collection methodologies
- design survey strategies before they go on field visits.

In considering and collecting appropriate raw data / information collected in the field (primary data / information) learners should be guided to observe and record by:

- taking measurements and surveys, including questionnaires, observations and interviews
- making images, including field sketches and photographs
- obtaining raw census material
- obtaining information from GIS.

Data collected in the field is often referred to as primary data and involves such quantitative skills as measurements, and qualitative skills as observations and interviews.

Learners should also be guided towards sampling techniques, coding, timing and frequency as appropriate. In order to understand the theoretical or comparative context of their research question(s) learners also need to be guided to collect secondary information as appropriate. This is data that has already been processed in published materials. More details follow in Unit 5 of this specification.

After their various fieldwork activities, learners should be given opportunities to:

- consider appropriate methods of data / information presentation
- reflect on their fieldwork findings by processing data
- analyse patterns and trends and draw conclusions
- evaluate techniques and the various fieldwork activities.

The exercise of collecting and analysing field data and reflecting on the fieldwork as a whole provides the preparation necessary for the completion of the final sections in the written independent investigation in Unit 5.

Centres will be required to verify that the prescribed fieldwork for each learner has taken place. See Section 3.3 for the verification arrangements for fieldwork.

2b. The place of geographical skills in the specification

Geographical skills should be addressed in all units, not as a separate theme or topic. Learners must be introduced to an approximately equal balance of quantitative and qualitative skills across the specification as a whole, although the balance between the two will vary depending on the theme. Details in Sections 2.1 and 2.2 specify the particular geographical skills that must be addressed in each theme. Appendix A identifies where these skills can be integrated.

Learners are required to:

- understand the nature and use of different types of geographical information, including qualitative and quantitative, primary and secondary, images, factual text and discursive / creative material, digital data, numerical and spatial data and innovative forms of data, including crowd-sourced and 'big data'
- collect, analyse and interpret such information, and demonstrate the ability to understand and apply suitable analytical approaches for the different information types
- undertake informed and critical questioning of data sources, analytical methodologies, data reporting and presentation, including the ability to identify sources of error in data and to identify the misuse of data.

For qualitative data, learners must demonstrate the following skills:

- use and understand a mixture of methodological approaches, including using interviews
- interpret and evaluate a range of source material including textual and visual sources
- understand the opportunities and limitations of qualitative techniques such as coding and sampling, and appreciate how they actively create particular geographical representations
- understand the ethical and socio-political implications of collecting, studying and representing geographical data about human communities.

For quantitative data, learners must demonstrate the following skills:

- understand what makes data geographical and the geospatial technologies (e.g. GIS) that are used to collect, analyse and present geographical data
- demonstrate an ability to collect and to use digital, geo-located data, and to understand a range of approaches to the use and analysis of such data
- understand the purposes and difference between the following and be able to use them in appropriate contexts: descriptive statistics of central tendency and dispersion
- descriptive measures of difference and association, inferential statistics and the foundations of relational statistics, including (but not limited to) measures of correlation and lines of best fit on a scatter plot
- measurement, measurement errors, and sampling.

2.1 AS UNITS

Unit 1

Changing Landscapes
Written examination: 2 hours
24% of qualification
96 marks

This unit is divided into two sections: A and B.

SECTION A – Changing Landscapes

In this section there is a choice between **either:**

1.1 Coastal Landscapes **or**
1.2 Glaciated Landscapes

Scale in this section is fundamentally at the local level, but includes a wider region to put the local level into context; it also emphasises linkages between local and regional and extends to national and international.

SECTION B – Tectonic Hazards

The questions in this section focus on physical and human geography and the inter-relationships between people and environment.

Scale in this section covers local to global as appropriate to the context.

Geographical skills

In Section A, Changing Landscapes, learners should use quantitative approaches including developing observation skills, measurement and geo-spatial mapping skills, together with data manipulation and statistical skills applied to field measurement. Qualitative approaches may be used if appropriate.

Appendix A identifies where these skills can be integrated.

In Section B, Tectonic Hazards, learners are expected to apply the stipulated geographical skills acquired through the study of Section A, Changing Landscapes in Unit 1 and Section A, Changing Places in Unit 2, where appropriate. Appendix A illustrates the required skills and where they can be integrated into these two units.

SECTION A – Changing Landscapes

Either 1.1: Coastal Landscapes

This optional theme involves the study of coastal landscapes developed by the interaction of winds, waves and currents and the sediment supply from terrestrial and offshore sources. Study takes place within a systems framework, focusing on spatial and temporal variations in the geomorphological processes that operate within coastal landscapes and how the flows of energy and movement of materials combine to create specific landforms on rocky, sandy and estuarine coastlines. Scale in this theme is fundamentally at the local level but includes a wider region to put the local into context. Some content moves beyond the local to the global to embrace a variety of landscapes not evident in Wales and the UK, for example the study of mangrove coastlines.

The impact of human activity as a factor causing change within coastal landscape systems will also be studied.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts:** causality (linking processes to landforms and landscapes), equilibrium (related to dynamic equilibrium), feedback (the process by which the coastal system responds to changing inputs and outputs), interdependence (the relationship between human activity and coastal landscape systems), mitigation (related to coastal management), adaptation (related to shoreline plans), risk (in the context of the impact of extreme weather events associated with anthropogenic climate change on coastal processes and landforms), resilience (related to coastal management), systems (especially coastal sediment budgets), and thresholds (a factor that complicates the self-regulation of the coastal system: when crossed, it sets irreversible changes in motion).

Focus	Geographical content
1.1.1 The operation of the coast as a system	• The coastal system including inputs, outputs, stores and transfers of energy and materials • Terrestrial and offshore supplies of sediment • Coastal sediment cells • Dynamic equilibrium in the coastal system and zone of rapid changes
1.1.2 Temporal variations and their influence on coastal environments	• Diurnal tides, offshore and onshore currents • Constructive and destructive wave types and their characteristics and seasonal variations
1.1.3 Landforms and landscape systems, their distinctive features and distribution	• High energy coastal environments and associated erosional landforms and landscape systems including rocky coastlines • Low energy coastal environments and associated depositional landforms and landscape systems including sandy coastlines and estuarine coastlines
1.1.4 Factors affecting coastal processes and landforms	• Fetch, wave type, wave orientation, wave refraction and reflection • Lithological factors of mineral composition, hardness and solubility of rocks • Structural geology including bedding, dip, joints, folding and faulting
1.1.5 Processes of coastal weathering, mass movement, erosion and the characteristics and formation of associated landforms	• Sub aerial processes of weathering (physical, chemical and biotic) and mass movement including landslides, slumps and rock falls • Marine erosional processes of hydraulic action, abrasion (corrasion), corrosion and attrition • Characteristics of coastal landforms including cliffs, headlands and bays, cave-arch-stack-stump sequence and wave-cut platforms, geos and blowholes both for Wales and the UK and beyond

Focus	Geographical content
1.1.6 Processes of coastal transport and deposition and the characteristics and formation of associated landforms	• Processes of coastal transport of solution, suspension, saltation and traction including longshore drift • Processes of coastal deposition result from reduced energy levels including flocculation and sediment sorting • Characteristics of coastal landforms including beaches, spits, bars, tombolos and cuspate forelands both for Wales and the UK and beyond
1.1.7 Aeolian, fluvial and biotic processes and the characteristics and formation of landforms in coastal environments	• Action of wind and associated landforms of sand dunes • Action of fluvial processes in estuarine environments and associated landforms of tidal flats, salt marshes and micro-features of channels and rills • Action of biotic processes and associated development of coral reefs and mangrove coastlines
1.1.8 Variations in coastal processes, coastal landforms and landscapes over different time scales	• Process and landform changes in seconds: high energy storm events and rapid mass movement processes causing changes in cliff profiles • Seasonal process and landform changes: seasonal changes in beach profiles associated with seasonal variations in wave types • Process and landform changes over millennia: either eustatic or isostatic changes in sea level and their impact on one landform
1.1.9 Coastal processes are a vital context for human activity	• Positive impacts of coastal processes on human activity including the growth of tourism • Negative impacts of coastal processes on human activity including economic and social losses associated with coastal erosion • Case study of one management strategy to manage the impacts of coastal processes on human activity
1.1.10 The impact of human activity on coastal landscape systems	• Positive impacts of human activity on coastal processes and landforms including management and conservation • Negative impacts of human activity on coastal processes and landforms including offshore dredging and erosion of sand dunes • Case study of one management strategy to manage the impacts of human activity on coastal processes and landforms

Or 1.2: Glaciated Landscapes

This optional theme involves the study of glaciated and formerly glaciated landscapes shaped by valley glaciers and ice sheets, bearing erosional and depositional imprints of the passage of glacier ice in a range of features. Study will take place within a systems framework, focusing on spatial and temporal variations in the geomorphological processes that operate within glaciated landscapes and how the flows of energy and movement of materials combine to create specific landforms. Scale in this theme is fundamentally at the local level but includes a wider region to put the local into context. Some content moves beyond the local to the global to embrace a variety of landscapes not evident in Wales and the UK, for example the study of contemporary permafrost degradation.

The impact of human activity as a factor causing change within glaciated landscape systems will also be studied.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts:** causality (landforms processes and landscapes), equilibrium (a condition of balance within the glacial system which, when established, perpetuates itself unless controlling conditions change markedly), feedback (within the glacial system), interdependence (the relationship between human activity and the glacial landscape system), risk (in the context of water supply), systems (especially the glacial mass balance system), and threshold (a factor that complicates the self-regulation of the glacial system: when crossed, it sets irreversible changes in motion).

Focus	Geographical content
1.2.1 The operation of a glacier as a system	• The glacial system including inputs, outputs, stores and transfers of energy and materials • Change in the inputs to and outputs from a glacier over short- and long-time scales • The glacial budget including glacier mass balance and equilibrium • Positive and negative feedback in the glacier system
1.2.2 Climate change and the glacier budget over different time scales	• Causes of climate change through the Quaternary Ice Age including glacials, interglacials and stadial periods and thresholds for change • Causes of changes in the glacier budget through historical time including the Little Ice Age • Seasonal changes and their impact on the glacier budget
1.2.3 Glacier movement	• Differences between cold- and warm-based glaciers, their locations and rates of movement • Glacier ice movement including internal deformation, basal sliding, sub-glacial bed deformation, surge conditions, compressional / extensional flow
1.2.4 The range of glacial environments and their distribution	• Types of ice mass at a range of scales including cirque glaciers, valley glaciers, highland ice field, piedmont glaciers and ice sheets and sea ice • Past distribution of valley glaciers and ice sheets during the Quaternary Ice Age • Present day distribution of ice masses including valley glaciers and ice sheets

Focus	Geographical content
1.2.5 Processes of glacial weathering, erosion and the characteristics and formation of associated landforms	• Freeze-thaw weathering • Erosional processes of abrasion, plucking and sub- glacial fluvial erosion • Factors affecting glacial erosion including basal thermal regime, ice velocity, ice thickness, bedrock permeability and jointing • Characteristics of macro-scale glacial erosional landforms including cirques, pyramidal peaks, arêtes, glacial troughs, ribbon lakes, hanging valleys and truncated spurs; meso-scale glacial landforms including roches moutonnees, crag and tail; micro-scale glacial landforms including striations both for Wales and the UK and beyond
1.2.6 Processes of glacial and fluvioglacial transport, glacial and fluvioglacial deposition and the characteristics and formation of associated landforms	• Processes of glacial and fluvioglacial transport including supraglacial, englacial and sub glacial transfers and their resultant sediment characteristics (size, shape and sorting) • Landforms of glacial deposition including types of till (ablation, lodgement and deformation) and types of moraine (terminal, recessional, lateral, medial and push) and drumlins • Processes of fluvioglacial transport and deposition lead to ice-contact features including eskers, kames, kame terraces and proglacial features including sandurs, varves, kettle holes and kettle lakes both for Wales and the UK and beyond
1.2.7 Suites of landforms within glacial landscapes	• Variations in glacial landscapes between highland and lowland • Variations in glacial landscapes between ice sheets and valley glaciers
1.2.8 Periglacial processes and the formation of associated features	• Ground ice formation and associated features, including ice lenses, ice wedge polygons, patterned ground, pingos and thermokarst landscape • Frost weathering and mass movement can lead to features including nivation hollows, blockfields and scree slopes, pro-talus ramparts, solifluction terraces and head deposits • Periglacial action of water and wind and associated landforms of dry valleys (water) and loess plateaux (wind)
1.2.9 Variations in glacial processes, glacial landforms and landscapes over different time scales	• Process and landform changes in seconds: rapid mass movement processes causing changes in glacial valley profiles • Seasonal process and landform changes: landform changes associated with seasonal variations in fluvioglacial transport and deposition • Process and landform changes over millennia: post glacial reworking of glacial deposits, infilling of glacial lakes and creation of misfit streams by fluvial processes
1.2.10 Glacial processes are a vital context for human activity	• Impacts of glacial processes and landforms on human activity including glacial lake outburst floods • Impacts of human activity on glacial processes and landforms including extraction of sands and gravels and creation of reservoirs • (Case study of one) management strategy to manage either the impacts of glacial processes / landforms on human activity or human activity impacts on glacial processes / landforms • Permafrost degradation through human activity

SECTION B – Tectonic Hazards

This compulsory section is based on one theme, Tectonic Hazards.

1.3: Tectonic Hazards

This theme is based on a study of the structure of the Earth and the processes operative within the asthenosphere and lithosphere. These processes and their distribution are closely related to tectonic activity at plate boundaries. Tectonic hazards include primary hazards of volcanic and seismic events and secondary hazards resulting from both. Tectonic hazards have various effects on people and operate at a range of spatial and temporal scales. Steps can be taken to prepare for, adapt to and respond to tectonic hazards by employing a variety of strategies. The vulnerability of people to tectonic hazards can lead to some events turning into disasters.

As an outcome of studying the content of this theme, learners will gain an understanding of **specialised concepts**. These include inequality (linked to vulnerability and responses), interdependence (linked to aid), mitigation and adaptation (linked to responses to hazards), resilience (linked to strengthening strategies), risk (linked to vulnerability and turning hazards into disasters), and systems (with the cycle of tectonic renewal).

Focus	Geographical content
1.3.1 Tectonic processes and hazards	• Characteristics of the Earth's structure including core, mantle and crust and the boundaries between them • Mechanisms of plate movement including internal heating within the Earth, convection currents, ridge push and slab pull • Plate distribution and the processes operating at different margins including diverging, converging and conservative margins; and tectonic activity at hot spots • Global distribution of tectonic hazards and their link to tectonic processes • Characteristics of the physical hazard profile that influence its impact including magnitude (as measured on Mercalli and Richter scales and Volcanic Explosivity Index), predictability, frequency, duration, speed of onset and areal extent
1.3.2 Volcanoes, processes, hazards and their impacts	• Types of volcano including shield, composite and cinder and types of volcanic eruption including explosive and effusive • Volcanic processes and the production of associated hazards including pyroclastic flows, lava flows, ash falls, lahars, jökulhlaups, volcanic landslides and toxic gases • Demographic, economic and social impacts of volcanic hazards on people and the built environment including primary and secondary effects • Local scale, regional scale and global scale impacts of volcanic activity • Use example of one eruption to demonstrate the varied degree of risk and impacts of volcanic activity

Focus	Geographical content
1.3.3 Earthquakes, processes, hazards and their impacts	• Earthquake characteristics to include P and S waves, focus, depth and epicentre • Earthquake processes and the production of associated hazards including ground shaking, liquefaction and landslides • Demographic, economic and social impacts of earthquake activity on people and the built environment including primary and secondary effects • Local scale, regional scale and global scale impacts of earthquake activity • Use example of one place specific event to demonstrate the varied degree of risk and impacts of earthquake activity
1.3.4 Human factors affecting risk and vulnerability	• Economic factors including level of development and level of technology • Social factors including the population density, population profile (age, gender) and levels of education • Political factors including the quality of governance • Geographical factors including rural / urban location, time of day and degree of isolation
1.3.5 Responses to tectonic hazards	• Monitoring, predicting and warnings of volcanic eruptions and earthquakes • Short-term and long-term responses to the effects of earthquake and volcanic hazards (the hazard management cycle)

Unit 2

Changing Places
Written examination: 1 hour 30 minutes
16% of qualification
64 marks

This unit is divided into two sections: A and B.

SECTION A – Changing Places

This section is compulsory.

2.1 Changing Places

Scale in this section is fundamentally at the local level but includes a wider region to put the local level into context: it also emphasises linkages between local and regional and extends to national and international.

SECTION B – Physical and Human Fieldwork Investigation

In this compulsory section, the assessment will be on both fieldwork skills and practical physical and human fieldwork activity through the six-stage enquiry method.

Geographical Skills

In Section A, Changing Places, learners should use qualitative approaches involved in representing place, and to analyse critically the impacts of different media on place meanings and perceptions. The use of quantitative data, including the use of geospatial data must also be used to present place characteristics.

Appendix A identifies where these skills can be integrated.

SECTION A – Changing Places

This compulsory theme focuses on places and their dynamic characteristics. While Wales and especially the place(s) where the student lives / lived and / or studies are the context for study, appropriate examples from different regional and national contexts may be used, both in class and in field studies. 'Place' is a portion of geographic space to which meaning has been given by people. Different places have distinct characteristics due to their natural features and the landscapes that people have created. Places change over time and develop layered history. This history helps to shape the identity and 'personality' of a place. The identity is also shaped by the relationship to other places at a range of scales. A place, such as the Senedd in Cardiff Bay or Snowdonia National Park, may symbolise different things for different people. Places can evoke feelings of nostalgia, pride, hope, adventure, tranquillity or fear. Places are a vital part of the learner's everyday life. Within the Geographical content below place specific examples are given. However, these are not mandatory, other appropriate examples are equally valid.

Places are dynamic because the population, society, and the economy upon which they depend and the environment in which they are situated are in a constant state of flux. The changing economic environment impacts on employment structure with effects on the environment, the demography of the place and the consequent socio-economic characteristics. As places change there is often a need for government and society to respond through innovation, marketing and reinvention. This leads to the 'remaking' of rural and urban places. Economic restructuring drives change. This has major impacts on social inequalities, culture, and the environment.

Learners must begin by studying their 'home' place or the location of their studies. They should investigate how and why it has changed over time, both in reality and how it is represented (for instance in tourist literature or the media). These changes should be in a wider regional and national and global context. Change is often viewed in different and sometimes conflicting ways by different players (individuals, businesses, interest groups, government and its agencies).

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts**: adaptation (the ability to respond to changing events and to reduce current and future vulnerability to change), attachment (the linkages between individuals and places**)**, identity (how people view changing places from different perspectives and experiences), inequality (social inequalities between people and places: income and wealth inequality as a threat to society), interdependence (links between the economy and society: relations of mutual dependence and interdependence are worldwide and part of the world economy, trade, communications and production), globalisation (impact of world development on nations, regions and localities), representation (how places are portrayed by formal and informal agencies: people represent what they see and experience; how people are represented in political sense. How place is represented in literature, art and the media), sustainability (linked to rebranding, marketing and place making), and thresholds (the minimum demand or population needed to support the provision of a good or service: the tipping point for change within places).

Focus	**Geographical content**
2.1.1 Changing place; changing places – relationships and connections	• The demographic, socio-economic and cultural characteristics of places as exemplified by the 'home' place (this may be a locality, neighbourhood or a small community) within Wales and at least one further contrasting place either within or beyond Wales • Factors (shifting flows of and connections between people, resources, money and investment and ideas) that have shaped and continue to shape the characteristics of place at all scales from local to global, for example MNC fast food chains • The way in which continuity and change of these local to global factors affect learner's own lives and the lives of others

Focus	Geographical content
2.1.2 Changing place; changing places – meaning and representation	• Places are given meaning as a result of people's perceptions, engagement with and attachments to the place in question and are related to different identities, perspectives and experiences, for example Snowdonia National Park • Places are represented in a variety of different forms including advertising and promotional material through different media and publications, for example Cardiff St David's 2 • Contrasting images portrayed by and between the formal statistical, media and popular images of places • The way in which these meanings and attachments affect learners own lives and the lives of others
2.1.3 Changes over time in the economic characteristics of places	• Economic change in places over time can lead to structural changes in employment shown by the Clark Fisher Model • External forces and factors influencing economic restructuring including changing technology and lifestyles, government strategy and globalisation • Examples of the decline in primary employment in rural areas and in secondary employment in urban places, using the home area where possible
2.1.4 Economic change and social inequalities in deindustrialised urban places	• Consequences of the loss of traditional industries in urban areas including the cycle of deprivation, social exclusion, and lower pollution levels • Consequences of loss of secondary industries in urban areas including unemployment • Government policies in deindustrialised places including re-training, economic (local to global), environmental policies and stimulating tertiary growth and investment by foreign MNCs
2.1.5 The service economy (tertiary) and its social and economic impacts	• Retailing, commercial and entertainment expansion in some central areas and their demographic and economic drivers including rising affluence and technological change • Gentrification and associated social changes in central urban places experiencing re-urbanisation • The complexity of the changing service economy including the continuing decline for some central urban places, out-of-town retailing and office-parks, internet shopping and central entertainment and the impacts of these changes on people's lives at a range of scales
2.1.6 The 21st Century knowledge economy (quaternary) and its social and economic impacts	• Knowledge economy clusters including education, research, culture / creative industries, digital / IT companies, science and biotechnology • Locational factors encouraging cluster growth including proximity to universities and research institutes, government support, planning regulations and infrastructure • Impacts of quaternary industry clusters on people and places including place making and marketing, demographic change and global connectivity

Focus	Geographical content
2.1.7 The rebranding process and players in rural places	• Diversification in the post-productive countryside is achieved through re-imaging and regenerating rural places through recreation, heritage, media and event management that have been driven by local groups and external agencies • The consequences of rebranding on the perceptions, actions and behaviours of people, including those in other places who choose to relocate there, changes to businesses and the local community
2.1.8 Rural management and the challenges of continuity and change	• Managing rural change and inequality in diverse communities including issues of housing, transport and service provision, including Broadband provision • On-going challenges in rural places where regeneration / rebranding are absent or have failed or have created conflict • New challenges of managing change in some rural communities associated with counter-urbanisation and second home ownership, and possible actions
2.1.9 The rebranding process and players in urban places	• Re-imaging and regenerating urban places through sport / music stadia, cultural quarters, festivals, industrial heritage and flagship developments • Re-imaging and regenerating urban places through external agencies including governments, corporate bodies and community groups • The way in which the urban place has been re-imaged and regenerated impacts on the actions and behaviours of individuals, groups, businesses and institutions
2.1.10 Urban management and the challenges of continuity and change	• Re-imaging and regenerating affects the social and economic characteristics of urban places and may create conflicting perceptions • On-going challenges in urban places where regeneration / rebranding are absent or have failed or are causing overheating

SECTION B – Fieldwork Investigation in Physical and Human Geography

This compulsory section involves the assessment of physical and human geography fieldwork. Details of geography fieldwork, the six stages of enquiry and geographical skills are given in full in Section 2a and 2b of this specification.

The assessment will be based on both:

- physical geography fieldwork, linked to Unit 1, Section A, Changing Landscapes (1.1 Coastal Landscapes or Glaciated Landscapes 1.2) and,

- human geography fieldwork, linked to Unit 2, Section A, Changing Places (2.1), because the focus in each unit is on the local scale, which is appropriate to fieldwork. Appendix C lists specific opportunities to develop fieldwork appropriate to these units and geographical skills appropriate to fieldwork should be selected from Appendix A.

The focus of the assessment will be on both fieldwork skills and the learner's own fieldwork, which is based on the enquiry process undertaken for physical and human geography fieldwork. Any of the related elements in the six stages of enquiry can be included in the assessment of the learners' own fieldwork. The following table, from Section 2a, links the six stages to the assessment objectives.

Sequence and enquiry questions	**Geographical skills**	**Assessment Objectives**
1. Context and planning – what is the geographical enquiry process?	Prepare to investigate a geographical question in the field; make and justify decisions on the task including data collection methods and how to use them; define the research question(s) that underpin the context of the field investigation; assessment of risk and ethical issues	AO3 AO1
2. Data collection – how is data and information (evidence) collected?	Acquire field data (primary) and relevant literature (secondary data / information) pertinent to the research question; observe and record in the field using quantitative and qualitative methods and primary and secondary data / information; understand the theory / context for the research question	AO3 AO1
3. Presentation and display – how is the collected data and information presented?	Process field and any relevant secondary data / information using quantitative and qualitative methods in order to lead to appropriate analysis	AO3
4. Analysis and interpretation of findings – how can the evidence be analysed?	Interpret and analyse data / information from primary sources, and, as relevant, secondary data / information; describe patterns, trends, relationships; apply knowledge and understanding of geographical knowledge, concepts and processes and theory to specific evidence collected to understand field observations	AO3
5. Conclusion – what conclusions can be drawn and how do these relate to the initial aim of the enquiry?	Synthesise findings to draw conclusions based on evidence and theoretical research	AO3
6. Evaluation of the whole investigation – what evaluative techniques should be applied to the enquiry process?	Critically reflect on every stage of the whole investigation in order to appreciate the strengths and limitations of the primary and secondary data, links to original question*;* note strengths and limitations (accuracy, validity and reliability) and anomalies and / or errors or misuse of data; evaluate the methodology including, if relevant, sampling techniques; suggest improvements for further research	AO2

2.2 A2 UNITS

Unit 3

Global Systems and Global Governance
Written examination: 2 hours
24% of qualification
96 marks

This unit covers the following core themes.

SECTION A – Global Systems

This section is compulsory.

3.1 Water and Carbon Cycles

SECTION B – Global Governance: Change and Challenges

This section is compulsory.

3.2 Global Governance: Change and Challenges

Scale is emphasised in this unit through the role of national governance and how this operates at an international scale to contribute to the global commons, although there is, to reinforce the concepts, added depth through exemplification at the local scale.

SECTION C – 21st Century Challenges

This section is compulsory. The assessment has one extended response question with resource material and draws on both Units, 1, 2 and 3, and where appropriate links to themes studied in Unit 4. There is a choice of **two** questions in the assessment.

Geographical skills

In Section A, Water and Carbon Cycles, learners should engage with a range of quantitative skills, including understanding of simple mass balance, unit conversions, and the analysis and presentation of field data. Qualitative approaches may be used if appropriate

In Section B, Global Governance: Change and Challenges, learners should use both quantitative and qualitative approaches across the theme as a whole.

Appendix A identifies where these skills can be integrated.

SECTION A – Global Systems

3.1: Water and Carbon Cycles

This compulsory theme is based on the physical processes which control the cycling of both water and carbon between land, oceans and the atmosphere. It takes place within a systems framework to emphasise the integrated nature of land, oceans and atmosphere, so that learners can gain an understanding of the key role played by the carbon and water cycles in supporting life on Earth. Systems operate at a range of temporal scales (seconds to millions of years) and space (plant to global) scales.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts:** adaptation (to maintain equilibrium),causality (changes within the cycles), equilibrium (of the cycles), feedback (within the systems), interdependence (of the two cycles), mitigation (to maintain equilibrium), resilience (of the system), sustainability (of the system), systems (the water and carbon cycles), and thresholds (the tipping point for change within and between the cycles).

Focus	Geographical content
3.1.1 The concepts of system and mass balance	• Inputs, outputs, stores and flows in the water cycle, including the concept of mass balance • Distribution, size and characteristics of major stores of water including lakes, oceans, atmosphere and cryosphere, vegetation, soil and groundwater stores • Change in size of stores over space and time including , sea-level change and cryospheric processes (ice accumulation and ablation) • Processes which control transfers within and between land, ocean, atmosphere and cryosphere at a range of time (minutes to millennia) and space (hillslope to global) scales
3.1.2 Catchment hydrology – the drainage basin as a system	Example(s) from Wales should be used to illustrate the following: • Input: precipitation type, amount, duration and intensity • Flows: throughfall and stemflow, infiltration, overland (saturation and infiltration excess) flow, throughflow, percolation, groundwater flow and channel flow • Stores: interception store, vegetation store, surface store, soil moisture store, channel store, groundwater store • Outputs: evaporation, transpiration and channel discharge to oceans
3.1.3 Temporal variations in river discharge	• Characteristics of river regimes including simple and complex regimes • Factors influencing river regime characteristics including climate, season, geology, vegetation and land use • The components and shape of storm hydrographs • Climatic factors influencing storm hydrographs including precipitation type, amount, duration and intensity, temperature, evaporation, transpiration and antecedent conditions • River catchment characteristics influencing storm hydrographs including size and shape, drainage density, porosity and permeability of soils and rock types, slopes, vegetation and land use

Focus	Geographical content
3.1.4 Precipitation and excess runoff within the water cycle	• Causes of air uplift, condensation and cloud formation including orographic, frontal and convection • Theories of precipitation formation including Collision and the Bergeron-Findeisen process • Causes of excess runoff generation including prolonged precipitation, intense storms, monsoon rainfall and snowmelt • Human causes of excess runoff generation including changing land use and river mismanagement
3.1.5 Deficit within the water cycle	• Meteorological causes, including seasonal variation or longer-term climate change • Human causes, including depleting aquifers and surface water resources by extraction • Natural and artificial recharge of aquifers to address the deficit

3.1.6 The global carbon cycle	• Distribution and size of carbon stores in oceans, Inputs, outputs, stores and flows in the carbon cycle, including the concept of mass balance
	• Carbon pathways and processes between:
	  • land and atmosphere at the local (plant), short-term scale, including fossil fuel combustion, carbon sequestration and the processes of photosynthesis, respiration, decomposition (measured over seconds)
	  • ocean and atmosphere through the processes of absorption by biota, diffusion into and out of oceans
	  • land and oceans at the continental scale through the processes of weathering, river transport, indirect movement via the water cycle and carbon sequestration in sediments over millions of years

3.1.7 Carbon stores in different biomes	• Size of carbon stores in the tropical rainforest and temperate grassland and factors influencing the size of these stores including temperature, precipitation and light • Changes in the size of carbon stores due to human activity including land-use change (deforestation, afforestation and agricultural activity)
3.1.8 Changing carbon stores in peatlands over time	• The accumulation of the carbon store through the process of peat formation • The reduction of the carbon store through peat extraction and drainage • The restoration of the carbon store through management of peatlands
3.1.9 Links between the water and carbon cycles	• Causes of recent increases in the atmospheric carbon store • Relationship between recent increases in the atmospheric carbon store and the energy budget • Impacts of recent increases in the atmospheric carbon store on the water cycle and oceans, including: amount, type and patterns of precipitation, extreme weather, river discharge, sea level rise, acidification of the oceans • Links between the water and carbon cycles at the local scale
3.1.10 Feedback within and between the carbon and water cycles	• Positive and negative feedback loops, thresholds and equilibrium in natural systems • Consequences of change within and between the water and carbon cycles including cryosphere feedbacks, marine carbon feedbacks, terrestrial carbon feedbacks and methane feedbacks • The implications of feedback within and between the two systems for life on Earth, including Arctic permafrost thawing

SECTION B – Global Governance: Change and Challenges

3.2: Global Governance: Change and Challenges

This theme covers global change and challenges. The focus of 3.2.1 to 3.2.5 is processes and patterns of global migration, a global flow which has historically had a major impact on most countries. Technological developments have accelerated migration over time, giving rise to a shrinking world. This brings opportunities and challenges to different localities.

The focus on 3.2.6 to 3.2.10 is the global governance of the Earth's oceans. Global flows that cross oceans include container shipping, oil tankers, broadband networks and illegal movements of people and goods. The oceans also function as a global commons for waste. Over time, nations have recognised the strategic importance of oceans. Throughout this section, learners are encouraged to reflect on how connectivity has linked people, places and environments across the globe, involving movements of goods, technology, people and ideas. While globalisation is sometimes characterised as a borderless world, in reality a growing number of national and international laws and conventions have been introduced. These laws and conventions aim to manage global systems and the consequences they bring to people, places and environments around the world, which are often tied to issues of power, justice and inequality. Systems operate at a range of temporal scales and space (local to global) scales.

As an outcome of studying 3.2.1 to 3.2.5, learners will gain an understanding of **specialised concepts:** causality (drivers of global patterns of migration), globalisation (links between countries), risk (associated with refugees), and resilience (ability of neighbouring countries to cope with refugees).

3.2.1 to 3.2.5: Processes and Patterns of Global Migration

Focus	Geographical content
3.2.1 Globalisation, migration and a shrinking world	• Growth of global systems; connections and global flows of goods, money, people, technology and ideas • Classification of migrants and quantification and mapping of global patterns of migration • Factors creating a shrinking world for potential migrants • including transport, communication and media representation
3.2.2 Causes of international economic migration	• Factors driving international out-migration, including poverty, primary commodity prices and poor access to markets within global systems • Recent drivers of migration including the development of diaspora communities, colonial and Commonwealth links and legislation permitting freedom of movement, including the EU • How powerful superpowers exert influence and disproportionately attract international migrants to their own advantage, including political strategies to develop cities as global hubs for investment and migration
3.2.3 Consequences and management of international economic migration	• Flows of money, ideas and technology linked with economic migration that reduce or exacerbate global economic inequalities, including remittances and the 'brain drain' of skilled workers. These factors can cause conflict but promote growth and stability • Increased economic, social, political and environmental interdependency of host and source countries and the people who live there • Migration policies of host and source countries, including the management of conflicting views about cultural change and migration held by individual UK citizens including those within Wales (and learner's own lives)

3.2.4 Causes, consequences, and management of refugee movements	• Causes of international refugee movements and internal displacement of people (Internally Displaced People), including geopolitical events driven by powerful states and economic injustice, such as 'land grabs' • Consequences of these movements on the lives of refugees and their destinations including lives of people in neighbouring states and developed economies • Actions to tackle refugee crises including the work of UNHCR, national governments and NGOs • The powerlessness of some states in conflict or disaster zones in relation to cross-border flows of people (refugees, soldiers, militia groups) and resources
3.2.5 Causes, consequences, and management of rural-urban migration in developing countries	• Push factors in rural areas, including mechanised agriculture, MNCs, 'land grabs' and the displacement of indigenous peoples by global systems • Employment pull factors in urban areas in developing and emerging economies, including global supply chain growth in export processing zones (EPZs) • Consequences of rural-urban migration for rural and urban areas of the developing world, including top-down planning in developing megacities, and bottom-up urban community development

3.2.6 to 3.2.10: Global Governance of the Earth's Oceans

As an outcome of studying 3.2.6 to 3.2.10 learners will gain understanding of specialised concepts: causality (instability in ocean environments), globalisation (links between countries), mitigation (attempts to manage the global commons), risk (to ocean environments), and sustainability (management of ocean environments).

Focus	Geographical content
3.2.6 Global governance of the Earth's oceans	• Post-1945 supranational institutions for global governance including UN and UNESCO, EU, G7/G8, G20, G77 and NATO • Laws and agreements regulating the use of the Earth's oceans in ways that promote sustainable economic growth and geopolitical stability • Strategic value of the oceans for global superpowers and security issues affecting maritime trade, including the governance of oil transit chokepoints, the Suez and Panama canals and piracy hotspots • Connections between places and the lives of people across the globe created by the UK's past role as a maritime power, including the Commonwealth
3.2.7 Global flows of shipping and sea cables	• Changing trends, patterns, networks and regulation of shipping including containers and oil tankers • Growth of smuggling and people trafficking and international efforts to manage these flows • Growth of seafloor cable data networks including causes, trends, patterns and uses • Risks to seafloor cable data networks including those from tsunamis and undersea landslides, and international conventions to protect seafloor data cables

3.2.8 Sovereignty of ocean resources	• Distribution and ownership of major ocean resources including minerals and fossil fuels, including the establishment and reproduction of territorial limits and sovereign rights that benefit some states but not others • Geopolitical tensions including the contested ownership of islands and surrounding seabeds and attempts to establish ownership of Arctic Ocean resources • Injustices arising from unequal access to ocean resources, including the geographical consequences for poor landlocked countries and indigenous people in some coastal areas
3.2.9 Managing marine environments	• The concept of the Global Commons and its applicability to the management of the Earth's oceans • Causes and consequences for different people and learner's own lives and places of over-exploitation of marine ecosystems • The need for sustainable management of marine environments to promote long-term global growth and stability, including local no-catch zones, regional quotas limits and marine conservation zones
3.2.10 Managing ocean pollution	• Main sources, causes and consequences of ocean pollution including terrestrial run-off, waste disposal and oil spillage, eutrophic dead-zones, plastic garbage patches and the role of ocean currents • Strategies to manage marine waste at different scales including global conventions, EU rules, awareness-raising and local actions • An ocean issues case study exploring the different geographical scales of governance and the way they interact, for example the local / regional / national / international / global strategies for Arctic Ocean conservation, or a UNESCO marine heritage site

SECTION C – 21st Century Challenges

The assessment in this section will focus on learners' ability to draw together elements from across the course. Application of knowledge and understanding of at least two of the four themes in Units 1, 2 and 3 will be in the assessment.

Application of knowledge and understanding of appropriate specialised and such key concepts as place, space, scale and understanding will also be relevant. The core themes become linked through applied understanding of these key concepts. These concepts underpin the study of both physical and human geography and provide unity for the study of geography as a whole and help learners to gain a better understanding of what 'thinking like a geographer', means.

The applied specialised concepts of sustainability and resilience, for example, can help learners to explore future possibilities for either a physical system or an urban settlement under pressure, in Units 1 and 2. The concept of scale can help learners in human geography provide an assessment of how globalisation has affected migration flows, in Unit 3, because local urbanisation movements and international movements can be addressed. In physical geography the concept of scale can help leaners provide an assessment of how glaciation has modified a landscape, both of which are in Unit 1, because there are both highly localised and larger scale regional modifications to consider. Credit will also be given to learners when and where it is possible to introduce knowledge and understanding from the themes in Unit 4.

Stimulus material is included in the assessment and learners should use the issues presented in this material to answer one question. A choice of two questions will be in the assessment.

Unit 4

Contemporary Themes in Geography
Written examination: 2 hours
16% of qualification
64 marks

This unit covers the following areas of study in contemporary themes.

SECTION A –Tectonic Hazards

This section is compulsory.

4.1 Tectonic Hazards

This section is based on one compulsory theme, Tectonic Hazards. The content is the same as the content in Section C, Tectonic Hazards in Unit 1, Changing Landscapes. The assessment is more challenging and builds on AS.

SECTION B – Contemporary Themes in Geography

This section is based on four optional themes. **Two** optional themes must be selected for study.

4.2 Ecosystems
4.3 Economic Growth and Challenge: India or China or Development in Sub-Saharan Africa
4.4 Energy Challenges and Dilemmas
4.5 Weather and Climate

Scale in this unit covers local to global as appropriate to the context.

Geographical Skills

Learners are expected to apply the skills acquired through the study of Units 1, 2 and 3, where appropriate, both to Section A, Tectonics Hazards and to their selected themes in Section B.

SECTION A – Tectonic Hazards

In this compulsory Section A, the theme Tectonic Hazards, is assessed by one compulsory extended response question. This theme has a choice of two questions in the assessment. This is an extension of the earlier AS compulsory theme. Knowledge and understanding previously learnt in Theme 1.3 should be utilised when addressing the content of Theme 4.1. This ensures progression from AS to A2. Additional content is highlighted in bold below.

4.1: Tectonic Hazards

This compulsory theme is based on a study of the structure of the Earth and the processes operative within the asthenosphere and lithosphere. These processes and their distribution are closely related to tectonic activity at plate boundaries. Tectonic hazards include primary hazards of volcanic and seismic events and secondary hazards resulting from both. Tectonic hazards have various effects on people and operate at a range of spatial and temporal scales. Steps can be taken to prepare for, adapt to and respond to tectonic hazards by employing a variety of strategies. The vulnerability of people to tectonic hazards can lead to some events turning into disasters.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts**: inequality (linked to vulnerability and responses), interdependence (linked to aid), mitigation and adaptation (linked to responses to hazards), resilience (linked to strengthening strategies), risk (linked to vulnerability and turning hazards into disasters), and systems (with the cycle of tectonic renewal).

Focus	**Geographical content**
4.1.1 Tectonic processes and hazards	• Characteristics of the Earth's structure including core, mantle and crust and the boundaries between them • Mechanisms of plate movement including internal heating within the Earth, convection currents, ridge push and slab pull • Plate distribution and the processes operating at different margins including diverging, converging and conservative margins; and tectonic activity at hot spots • Global distribution of tectonic hazards and their link to tectonic processes • Characteristics of the physical hazard profile that influence its impact including magnitude (as measured on Mercalli and Richter scales and Volcanic Explosivity Index), predictability, frequency, duration, speed of onset and areal extent
4.1.2 Volcanoes, processes, hazards and their impacts	• Types of volcano including shield, composite and cinder and types of volcanic eruption including explosive and effusive • Volcanic processes and the production of associated hazards including pyroclastic flows, lava flows, ash falls, lahars, jökulhlaups, volcanic landslides and toxic gases • **Environmental,** demographic, economic and social impacts of volcanic hazards on people and the built environment including primary and secondary effects • Local scale, regional scale and global scale impacts of volcanic activity • **Use examples of at least two contrasting contexts** to demonstrate the varied degree of risk and impacts of volcanic activity

Focus	Geographical content
4.1.3 Earthquakes **and tsunami**. Processes, hazards and their impacts	• Earthquake characteristics to include P and S waves, focus, depth and epicentre • Earthquake processes and the production of associated hazards including ground shaking, liquefaction, landslides and tsunami • **Environmental**, demographic, economic and social impacts of earthquake **and tsunami** activity on people and the built environment including primary and secondary effects • Local scale, regional scale and global scale impacts of earthquake **and tsunami** activity • **Use examples of at least two contrasting contexts** to demonstrate the varied degree of risk and impacts of earthquake activity • **Use examples of at least two contrasting contexts to demonstrate the varied degree of risk and impacts of tsunami activity**
4.1.4 Human factors affecting risk and vulnerability	• Economic factors including level of development and level of technology • Social factors including the population density, population profile (age, gender) and levels of education • **Political factors including the quality of governance** • Geographical factors including rural / urban location, time of day and degree of isolation
4.1.5 Responses to volcanic hazards	• Monitoring, predicting and warnings of volcanic eruptions • **Mitigating volcanic hazards and modifying the event, vulnerability and loss** • Short-term and long-term responses to the effects of volcanic hazards (the hazard management cycle)
4.1.6 Responses to earthquakes and tsunami	• Monitoring, predicting and warnings of earthquakes and tsunami • **Mitigating earthquake and tsunami hazards and modifying the event, vulnerability and loss** • Short-term and long-term responses to the effects of earthquake and **tsunami** hazards (the hazard management cycle)

SECTION B – Contemporary Themes in Geography

This section is based on four optional themes. **Two** optional themes must be selected for study.

4.2 Ecosystems
4.3 Economic Growth and Challenge: India or China or Development in Sub-Saharan Africa
4.4 Energy Challenges and Dilemmas
4.5 Weather and Climate

The optional themes have been designed to make links between physical and human geography and to focus on people-environment interactions. Learners should strive to develop in-depth knowledge, critical understanding and an overview of the concepts and issues underpinning the geographical content of the selected themes. Knowledge of relevant geographical terminology is important.

Each optional theme in this unit has a choice of **two** questions in the assessment.

4.2: Ecosystems

This optional theme addresses ecosystems. It has been argued that human well-being depends on the services provided by ecosystems (*from The UN Millennium Ecosystem Assessment*). It covers the processes that maintain or change ecosystems and the interactions between the component parts at a range of spatial and temporal scales. In this sense, people are viewed as drivers of change, as well as being at risk when the systems lose equilibrium. An understanding of the interdependence of the abiotic and biotic elements is critical. The Arctic tundra biome, excluding Alpine, is the selected case study because this ecosystem is often seen as most at risk due to climate change.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts**: adaptation (of biotic components), causality (linked to changes due to human activity), equilibrium and feedback (within ecosystems), mitigation and sustainability (linked to management and conservation), resilience (of native peoples), risk (from local, regional and global threats), systems (linked to their structure and functioning) and threshold (tipping points within ecosystems).

Focus	**Geographical content**
4.2.1 The value and distribution of ecosystems	• The value of ecosystems as providers of goods and services for the survival and well-being of humans including medicines, gene pools and resilience to hazards • Distribution of the major global biomes • Relationship between temperature / precipitation and the distribution of biomes including forests, grasslands and deserts
4.2.2 The structure and functioning of ecosystems	• The ecosystem concept including energy flows • Variations in nutrient cycling between two biomes to show the size of stores and rates of flow • Levels of primary productivity linked to the presence of limiting factors including temperature, moisture, light and nutrient availability
4.2.3 Biodiversity under threat	• Measures of biodiversity • Threats to biodiversity from direct action and indirect action operating at a range of scales from local to global • Ecosystems at greatest risk including tropical rainforests, coral reefs and wetlands
4.2.4 Conserving biodiversity	• Strategies to conserve biodiversity including a range from total protection through no access to sustainable use • Conservation issues including decisions on which habitats / species to conserve, and sources and types of funding
4.2.5 Ecosystems at a local scale	• Succession of one ecosystem • The arresting role of physical factors in creating sub-climax communities • Role of human factors in maintaining plagioclimax communities
4.2.6 The Arctic tundra biome	• Characteristics of the climate, plants, animals and soils of the Arctic tundra biome • Interrelationships between the climate, plants, animals and soils of the Arctic tundra biome • Impacts of climate change on the Arctic tundra biome
4.2.7 Sustainable use of the Arctic tundra biome	• Threats to the Arctic tundra, including climate change, mineral exploitation and tourism • Conflicts with indigenous populations • Strategies used to manage the Arctic tundra biome

4.3: Economic Growth and Challenge: either India or China or Development in Sub-Saharan Africa

Economic Growth and Challenge: either India or China

This optional theme addresses either India or China, two countries with increasing influence globally. It covers the study of the contemporary geography of either India or China and reasons for their emergence as a superpower. In order to understand their status, learners are encouraged to develop an understanding of the opportunities and constraints for economic development presented by India's or China's physical environment placed in the context of the demographic, social, cultural, economic and political changes occurring in each nation at a range of spatial and temporal scales. Threats to India's or China's sustainable development include environmental degradation, issues of water, energy and food security and growing inequalities. Further success for India's or China's growing economies and increasing global status is now dependent on achieving sustainable development with an improved balance between economic growth and environmental conservation.

As an outcome of studying this theme, learners will gain an understanding of **specialised concepts**: adaptation (in the context of a country and society undergoing rapid change), inequality (the consequences of economic and social change), globalisation (the changing position of India or China as a world power and its economic, social, technological and environmental links to the rest of the world), resilience (the ability of people and places to adapt to economic, social and environmental change), risk (the threats of economic growth to environment and traditional society), and sustainability (with respect to economic growth, society and the environment).

Focus	Geographical content: India	Geographical content: China
4.3.1 The physical background of India **or** China	• Relief and drainage patterns • Characteristics and patterns of climate • Water availability	• Relief and drainage patterns • Characteristics and patterns of climate • Water availability
4.3.2 The demographic, social and cultural characteristics of India **or** China	• Factors affecting population distribution, growth and structure • Political systems and governance influencing social change including health, education and welfare • Cultural influences including attitudes to gender, the caste system in India	• Factors affecting population distribution, growth and structure • Political systems and governance influencing social change including health, education and welfare • Cultural influences including attitudes to gender, minority groups in China
4.3.3 Opportunities and constraints of India **or** China's physical environment	• Opportunities and constraints for economic development presented by the resource base including energy sources and minerals • Opportunities and constraints for economic development presented by the physical environment including relief, climate and water availability • Constraining effects of climate variability on human activity including droughts and floods	• Opportunities and constraints for economic development presented by the resource base including energy sources and minerals • Opportunities and constraints for economic development presented by the physical environment including relief, climate and water availability • Constraining effects of climate variability on human activity including droughts and floods

Focus	Geographical content: India	Geographical content: China
4.3.4 The economic and political background of India **or** China	• Distribution of economic activity • Influence of political systems of democracy in India on economic change • Role of government in the location and development of economic activity	• Distribution of economic activity • Influence of political systems of modified communism in China on economic change • Role of government in the location and development of economic activity
4.3.5 The global importance of India **or** China	• Recent changes in the size and structure of India's economy • The global shift, outsourcing and offshoring including the role of India as the global outsourcing capita • Influence of India's use of political (soft) power in the wider world including its participation in global organisations, governance, conventions and treaties	• Recent changes in the size and structure of China's economy • The global shift, outsourcing and offshoring including the role of China as the workshop of the world • Influence of China's use of political (soft) power in the wider world including its participation in global organisations, governance, conventions and treaties
4.3.6 Threats to India's **or** China's environment associated with economic growth	• Environmental pressures associated with economic growth including fossil fuel use, industrial pollution, soil erosion, deforestation and desertification • Environmental issues of water security, food security and energy security • Environmental pressures associated with rapid urbanisation	• Environmental pressures associated with economic growth including fossil fuel use, industrial pollution, soil erosion, deforestation and desertification • Environmental issues of water security, food security and energy security • Environmental pressures associated with rapid urbanisation
4.3.7 Sustainable development in India **or** China	• Strategies to manage **one** environmental problem associated with economic growth • Strategies to improve the security of either water **or** food **or** energy • Strategies to improve the sustainability of urban communities	• Strategies to manage **one** environmental problem associated with economic growth • Strategies to improve the security of either water **or** food **or** energy • Strategies to improve the sustainability of urban communities

Or: Development in Sub-Saharan Africa

This optional theme covers development within Sub-Saharan Africa. Development can be defined and measured in a variety of ways and there are variations in development both between and within countries. Development is influenced by a complex interplay of a variety of physical, economic, political, social and cultural factors that can operate to both promote and hinder the development process. The process of development often results in negative environmental impacts, including desertification, which constitutes a major challenge for many Sub-Saharan African countries. Strategies designed to manage and promote environmental, economic and social development are critical to avert the repeated humanitarian crises that characterise these countries.

As an outcome of studying this theme learners will gain an understanding of **specialised concepts**: sustainability (with respect to economic growth, society and the environment), globalisation and interdependence (the links between Sub-Saharan African countries and the rest of the world), risk (the threats of climate change, desertification and political instability), resilience (the ability of people and places to adapt to economic, social and environmental change), adaptation (in the context of a country and society undergoing rapid change), inequality (the consequences of economic, social and environmental change at regional and global scales).

Focus	**Geographical content**
4.3.8 Definitions, measures and patterns of development	• Changing definitions of development • Measuring development including simple and composite quantitative measures and qualitative measures • The development gap and development continuum • Variation within countries including regional, ethnic and gender differences
4.3.9 The influence of physical factors on the development of selected countries	• The influence of resource base of minerals and energy sources on development • The influence of soils, relief, climate and water availability on development • The constraining effects of climate variability, droughts and / or floods on development
4.3.10 The influence of economic factors on the development of selected countries	• Influence of free trade and trade blocs in promoting and hindering development including subsidies and tariffs, quotas and protectionism • The resource curse and conflict, including the issue of conflict minerals • Influence of MNCs, including foreign direct investment, out-sourcing and offshoring • Influence of tourism and fair trade
4.3.11 The influence of political, social and cultural factors on the development of selected countries	• Influence of political factors including governance, colonialism and neo-colonialism, global organisations and corruption. Influence of social factors including education, health and welfare, social and cultural constraints including the role of women and ethnic divisions
4.3.12 The impact of development on the environment	• Effects of economic development on consumerism and the environmental impact of the exploitation of natural resources • Environmental impacts of agro-industrialisation • Impact of manufacturing and extractive industries on the environment
4.3.13 Challenges of desertification	• Causes of desertification • Consequences of desertification • Strategies to address the causes and consequences of desertification
4.3.14 Strategies to promote development	• Role of national governments • Role of international aid agencies, NGOs and micro-finance schemes • Role of the World Bank and IMF

4.4: Energy Challenges and Dilemmas

This optional theme covers the classification and distribution of energy resources and the physical factors determining their supply. Reasons for the growing demand for energy are explored, together with the issues associated with the management of energy supplies. Factors influencing a country's energy mix are examined, including the link with development. The traditional energy sources used in developing countries pose challenges which are being addressed through appropriate technology. Attempts to provide sustainable solutions require co-operation between governments, energy providers and individuals working together to implement international, national and local strategies. The objective is to provide clean, green energy supplies at affordable costs that are socially equitable.

As an outcome of studying this theme learners will gain an understanding of **specialised concepts:** adaptation (the shift to appropriate technology), causality (of physical factors determining energy supplies), inequality (due to unequal access to energy supplies), interdependence and globalisation (in the form of agreements between OPEC countries), mitigation (through new technologies of carbon capture and sequestration), risk (the problems associated with energy supplies), and sustainability (clean, alternative energy sources).

Focus	**Geographical content**
4.4.1 The classification and distribution of energy resources	• Classification of energy resources • Global distribution of fossil fuel stocks and reserves • Alternatives to conventional fossil fuel sources
4.4.2 Physical factors determining the supply of energy	• Geological factors including physical reserves of fossil fuels and active areas for geothermal energy • Climatic factors including insolation rates and wind strength and reliability • Relief factors including suitable locations for dam construction and hydropower • Locations with favourable conditions for sustainable energy generation from waves, tides and biofuels
4.4.3 The changing demand for energy	• Changing global patterns of energy demand • Economic factors influencing the demand for energy • Demographic and social factors influencing the demand for energy • Technological factors influencing the demand for energy
4.4.4 The global management of oil and gas	• Managing the imbalance between the supply of and demand for oil and gas through transfers, storage and pricing • Management of oil and gas exploration and production by MNCs and national governments • Management of oil supplies by OPEC and national governments
4.4.5 Problems associated with extraction, transport and use of energy	• Environmental problems associated with fossil fuels and other forms of energy • Political problems associated with fossil fuels and other forms of energy • Technological problems associated with fossil fuels and other forms of energy • Economic problems associated with fossil fuels and other forms of energy
4.4.6 Energy mixes and development	• At a local scale, the use of appropriate technology for sustainable energy micro-generation in developing countries • At a national scale, factors influencing the energy mix of countries at different stages of development • At the global scale, economic and political factors affecting world energy prices and energy mix
4.4.7 The need for sustainable solutions to meet the demand for energy	• Policies for demand reduction and increased energy efficiency at the global, national and local scale • Clean technologies for fossil fuels including carbon capture, carbon sequestration and gasification and transport technologies • Sustainability of alternative energy sources

4.5: Weather and Climate

This optional theme begins with a global perspective on how the world's atmospheric systems lead to a variety of distinctive climatic types. It then focuses on the UK to explore how contrasting air masses and variable weather systems lead to one of the most changeable climates in the world. The contrasting weather systems can lead to the occurrence of weather and climate hazards, with some areas more at risk than others, or showing less resilience and more vulnerability to their impacts. Strategies of mitigation and adaptation are used to manage these weather and climate hazards, which show a rising trend as a result of short-term climate changes leading to more extremes of weather. With increasing urbanisation many areas now have distinctive urban climates in terms of weather and atmospheric quality. Globally, the challenges of climate change and the possibility of reaching a tipping point in terms of global warming provide challenges for the world to manage.

As an outcome of studying this theme learners will gain an understanding of **specialised concepts:** causality (linking atmospheric processes to the characteristics and function of climate types), interdependence (the interdependence of factors that may lead to future climate and weather), mitigation and adaptation (in the context of managing atmospheric hazards), resilience (the ability of humans to resist the threats posed by atmospheric hazards and the ability of atmospheric systems to respond to a disturbance or adapt to climate change), risk (in the context of living in areas that experience atmospheric hazards), systems (linked to pressure systems and circulation) and threshold (the tipping points associated with human impact on the atmospheric system).

Focus	**Geographical content**
4.5.1 Global controls on climate	• Structure of the atmosphere including the characteristics of different layers and their role in climate regulation and the atmospheric heat budget • Processes of global atmospheric circulation including the tricellular model • Distribution of the world's high and low pressure belts and their impact on planetary surface winds; oceanic circulation and its impact on climate; the regional impacts of continentality and altitude on climate
4.5.2 World's major climate types	• Major climatic types and their distinctive characteristics including temperature, precipitation, winds and pressure • Seasonal variations in the position of the ITCZ including migrations of the heat equator, wind and pressure belts • Monsoon climate including seasonal changes of precipitation, temperature, winds and atmospheric pressure
4.5.3 Climate and weather of Wales and the UK	• Characteristics of the climate in Wales and the UK • Sources and characteristics of air masses and their influence on Wales and the UK's weather • Impacts of variations in the position, pattern and amplitude of the jet stream on the UK's weather
4.5.4 Extreme weather events	• Causes and consequences of recent and cyclic climate change including extreme weather events • Changing vulnerability of populations to weather and climatic hazards including exposure to climatic variability, sensitivity to stress and adaptive capacity
4.5.5 Impacts and management of climatic hazards	• Impacts of hazards associated with low-pressure systems on the environment and human activity • Impacts of hazards associated with high-pressure systems on the environment and human activity • Strategies to manage climatic hazards
4.5.6 Impacts of human activities on the atmosphere at local and regional scales	• Impacts of urban areas on temperature, wind, precipitation and humidity • Impacts of urban areas on air quality including particulate pollution, photochemical smog and acid rain • Strategies to reduce the impact of human activity on urban climates and air quality
4.5.7 People, climate and the future	• Global impact of anthropogenic climate change on shifting climate belts • Consequences of reaching atmospheric tipping point including environmental and economic impacts • Strategies to mitigate and adapt to climate change at a variety of scales

Unit 5

Independent Investigation
Non-exam assessment
20% of qualification
80 marks

The non-exam assessment is integral to A level Geography and contributes 20% to the overall final assessment. This unit requires a single independent investigation by each learner and involves, but need not be restricted to, fieldwork. The focus of the investigation must be derived from the specification content. The independent investigation builds on the fieldwork developed throughout the specification and the requirements to relate fieldwork to knowledge and understanding of the six stages of the enquiry process. The fieldwork enables learners to carry out field (primary) data collection and this forms the basis of the independent investigation. Learners can collect further primary data, if this suits their chosen research question.

The learner must define their research area and their own title. That is the independent investigation must be based on a question or issue defined and developed by the learner individually to address aims, questions, and / or hypotheses. Learners must support their research area and its context through further literature and background material using secondary data.

Appropriate collection, selection and presentation of the learner's own field (primary) data, incorporating appropriate geographical skills must form the basis of the subsequent analysis.

Learners must devise appropriate collection, selection and presentation of their own field (primary) data, through actively observing and recording work in the field, and which incorporates appropriate geographical skills. These findings must form the basis of the subsequent analysis.

Learners must independently contextualise, analyse and summarise their findings and data, draw conclusions and evaluate their whole investigation. As part of the reflection, learners should also make links and connections between their own research, the real world and geographical theory.

The whole body of work should be communicated clearly and logically by means of extended, well-structured writing, and present relevant data with a range of appropriate methods.

Some stages of the fieldwork may include group work, such as data collection, and this can be used as the basis for the learner's own independent investigation. Where there is group collection of data, learners must describe their role in this process and indicate data that is common material. However, the research question must show thorough individual research and the interpretation, analysis, conclusions and evaluation must be the **learner's own**, which is reflected in the weighting in assessment mark bands. The most able learners will show depth and some individuality in and critical reflection of their investigation, and will draw effectively on evidence and theory to make a well-argued case.

The required structure for the written independent investigation is framed by the six stages of the enquiry process. To structure their write up of their independent investigation logically and clearly, learners need to adopt this enquiry process and follow the structure below.

The structure of the written independent investigation

The writing of the learner's own investigation must be structured under the following headings, which are assessed and include the six stages of enquiry. The assessment objectives (AOs) listed refer to those that apply to each section.

Section	Contents	AO
Abstract of up to 250 words	Synopsis of the investigation, with research question and link to specification clearly stated	-
1. Context and planning	Background to the individual research question or issue; conceptual framework, including theoretical background; risk assessment and ethical issues supported by literature and background material (Location stated to give context)	AO1
2. Methods of field investigation	Description of methods used to observe, measure and record phenomena in the field applied to the data collection methods linked to a clear and appropriate research question; role undertaken in data collection (individual and / or group) with justification	AO3
3. Data presentation of findings with a range of techniques	Communicating field (primary) and secondary data / information collected through appropriate presentation techniques, allowing suitable analysis to be made, using quantitative and qualitative skills	AO3
4. Analysis and interpretation of findings	Analysis, interpretation / justification of findings in the light of data / information collected; data presentation techniques	AO3
5. Conclusions	Drawing well-evidenced conclusions, synthesising findings, and informed by theoretical background underpinning the research given in the introduction	AO3
6. Evaluation	A succinct, critical reflection of every stage of the whole investigation in order to appreciate the strengths and limitations of the field (primary) and secondary data, accuracy, degree of reliability and / or errors or misuse of data, bias, appreciate views and interests of stakeholders, methods used, findings and conclusions drawn; suggestions for further improvements and / or further research	AO2
Presentation requirements; references, appendices, structure	Bibliography of secondary information and relevant appendices included. Guidance on references, the word count and appendices can be found in Section 3.2 Arrangements for non-examination assessment	AO3

Collecting data / information

In collecting field data (primary data), through measurements and observations, learners should have an **adequate amount** of field (primary) data collected to allow them **to analyse** their findings required in section 4. Details in Section 2a of this specification give further information of field (primary) data collection, including sampling techniques.

Using geographical skills

Learners should demonstrate a range of quantitative and qualitative skills specific to data / information collection. Appendix A lists skills which relate to examination requirements, but learners may also use other relevant techniques and statistical techniques. These techniques could include Mann Whitney U Test, Pearson's Product Moment, and Simpson's diversity correlation.

Learners may use any of these quantitative and qualitative skills as appropriate to their investigation. For example, quantitative techniques might include measurements of flow, scale, spatial pattern and temporal change. Qualitative techniques might include use of questionnaire, bi-polar techniques and annotation of photographs / sketches.

Some secondary information must also be included in the independent investigations; for example, from background reading, satellite images, aerial and oblique photographs, large databases and GIS. Secondary information is data that has already been processed in written and cartographic form in published materials, such as text books, journals and online articles and includes material from:

- government materials
- media
- charities, NGOs, civil society organisations and pressure groups
- meteorological, environmental and conservation organisations
- geographical publications including text books and journals
- maps and charts.

Learners should be aware of possible bias in secondary data.

Time allocation

The non-exam assessment is integral to A level Geography and contributes 20% to the overall final assessment. Time is not prescribed for this work because the process of the learner's independent investigation including the fieldwork, research and writing is iterative. Learners should seek guidance from their teachers and engage as necessary in learner-led discussions.

As a consequence, the overall time given to this independent investigation both by the teacher and learners should be commensurate with the **20% weighting** for this unit**.**

3 ASSESSMENT

3.1 Assessment objectives and weightings

Below are the assessment objectives for this specification. Learners must:

AO1

Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change, at a variety of scales

AO2

Apply knowledge and understanding in different contexts to interpret, analyse and evaluate geographical information and issues

AO3

Use a variety of relevant quantitative, qualitative and fieldwork skills to:

1. investigate geographical questions and issues
2. interpret, analyse and evaluate data and evidence
3. construct arguments and draw conclusions

Assessment objectives are shown below as a percentage of the full A Level.

	AO1	AO2	AO3	Total
AS Unit 1	8.3%	8.5%	7.2%	24%
AS Unit 2	5.5%	5.7%	4.8%	16%
A2 Unit 3	12%	9%	3%	24%
A2 Unit 4	6%	9%	1%	16%
A2 Unit 5	2%	5%	13%	20%
Overall weighting	33.8%	37.2%	29%	100%

In their extended answers, learners will need to demonstrate their ability to communicate their knowledge, understanding and skills using appropriate spelling, punctuation and grammar, to access higher level marks

3.2 Arrangements for non-examination assessment (NEA)

This Geography specification requires each candidate to undertake an independent investigation which involves, but need not be restricted to, fieldwork. This investigation must be based on a question or issue defined and developed by the individual candidate. The investigation is assessed by means of a non-exam unit which accounts for 20% of the total assessment.

Further details on arrangements for non-exam assessment are provided annually by the Joint Council for Qualifications (JCQ). Please refer to the JCQ website, www.jcq.org.uk, for further information.

Preparation for the independent investigation

For candidates to display the skills necessary for attainment at the highest levels, centres must guide candidates towards appropriate research areas and establish the fieldwork enquiry process, in preparation for the independent investigation in Unit 5. This fieldwork can be linked to study in Units 1 and 2 of either a coastal or a glaciated landscape and changing places at the local level in the first instance. These can account for two of at least four days of fieldwork and on these days candidate can begin to develop their understanding of the six stages in the enquiry process. From these initial two days linked to Units 1 and 2, candidates can progress to develop a greater understanding of the enquiry process in further fieldwork activities. In total this will enable centres to reach the overall required total of the equivalent of at least four days of fieldwork. Centres can, if they wish, develop further fieldwork beyond this requirement. The required four or more days for fieldwork must involve out-of-classroom activity; these days must not be used for writing up the investigations.

Overall, from these days of fieldwork, learners should develop an understanding of the six stages of the enquiry process that will enable them to undertake research for, and completion of, their own independent investigation for Unit 5. Learners must also be made aware of the requirements and assessment objectives. Section 2a details the fieldwork enquiry process and full details of the independent investigation in Unit 5.

Independence and Teacher Guidance

The following section details the role of the teacher and what independence for the candidate means in practice.

Stages at which guidance is permitted:

1. Investigation title stage (guidance and approval)
2. Planning and investigation stage (guidance and approval)

Definition of guidance
General guidance is defined as guidance that enables learners to use their initiative in making amendments and improvements independently.

The following guidelines indicate the role of the teacher in this process.

Teachers can:

- provide broad parameters for candidates' investigation proposals (including, themes from the specification, locations, availability of equipment, time constraints)
- explain what independence means (see Appendix D)
- advise on health and safety considerations, the use of equipment and potential ethical concerns
- discuss with candidates their initial exploratory planning and tentative investigation titles.

Teachers must:

- confirm the provisional title has the potential to meet the assessment criteria and offer general guidance on any necessary amendments.
- review each candidates' Geography Independent Investigation form (see Appendix E). Within this review teachers should ensure that the proposed investigation can suitably access the specification requirements and give guidance on the methodology and analytical tools that the candidate plans to use.
- Promote good practice such as referencing and using a bibliography system
- Store work securely once it is handed in for formal assessment

Teachers must not*:

*This includes third party fieldwork providers. Teachers must ensure that at all times they remain confident in the authenticity and independence of the candidates' work

- provide candidates with a choice of titles or tasks from which candidates then choose
- give detailed feedback to individual candidates about how to improve work to meet the assessment criteria. The guidance provided prior to final submission should only enable candidates to take the initiative in making amendments, rather than detailing what amendments should be made. This means that teachers cannot provide templates and model answers for specific candidates work
- mark the work provisionally and share the mark so that the candidate may then improve it
- return work to candidates after it has been submitted and marked.

- give guidance on how to make improvements to the draft in order to meet the assessment criteria so that candidates are no longer engaged in independent learning.

If teachers give any assistance which goes beyond general guidance includes for example:

- provide detailed specific guidance on how to improve drafts to meet the assessment criteria
- give detailed specific guidance on errors and omissions which limits candidates' opportunities to show initiative themselves
- intervene to improve the presentation or content of work.
- Provide primary or secondary data not collected by the candidate either individually or as a group

Then they must record this assistance and take it into account when marking the work.

Annotation should be used to explain how marks were applied in the context of the additional assistance given. Failure to follow the above may constitute malpractice.

Examples of both specific guidance and general guidance are shown in Appendix F.

Description of the level of independence at each stage of the investigation

Teachers must refer to the descriptions of the level of independence in Appendix D and clarify this information with candidates. These descriptions do not infer anything in the way marks are allocated for each stage of the investigation; they are to specify the level of independence required at different stages.

Note that the level of independence at each stage is the minimum required (i.e. where collaboration is allowed it is not mandatory and candidates may work alone).

Levels of independence:

- Collaboration allowed - candidates may work as a class / group / pair
- Independent work - candidates must work alone

If candidates collaborate (where independence is expected) and/or are given assistance beyond the parameters indicated in Appendix D, then the teacher must record this on the Geography Independent Investigation Form and take into account when marking the work. Failure to do so will be considered as malpractice. If malpractice is suspected, the Awarding Organisation will investigate. If malpractice is found to have taken place, a penalty will be given dependent on the circumstances and severity of the malpractice.

For full information regarding malpractice, please see the JCQ document 'Suspected Malpractice in Examination and Assessments'.

Word length and guidance

The focus on the investigation must be derived from the specification the candidate is studying.

The guidance for word length is 3000 to 4000 words. This includes all the text, text boxes, and supplementary material such as photographs and data presentation techniques. It

does not include appendices and abstract. It is helpful when attaching appendices that these contain examples of raw data only, such as data sheets and questionnaires, rather than every questionnaire used.

Format for the written independent investigation

The report must:

- be word processed in Arial, Calibri or Times New Roman
- be font size 11 point
- have text set out in 1.5 spacing
- have all pages numbered
- have candidate number and centre number in either the header or footer on all pages
- have headings and labels for such items as photographs, tables and maps, with scales and keys / legends on maps.

References

References to all secondary information used in the written independent investigation must be acknowledged. This can be through an appended bibliography using a conventional in-text referencing system, such as the Harvard system, or through footnotes, although footnotes should be used to refer to the text. The Harvard system of referencing includes the use of title, author and date for publication. All sources and digital material taken from the internet must also be referenced with titles and URL addresses or screen shots.

Geography Independent Investigation form

All sections of this form must be completed by the candidate and teacher and the form must be attached to the work submitted for moderation. The form is comprised of three sections as follows:

1. Candidate / teacher authentication section

Centres must ensure that the candidate authentication section is completed for each candidate by both the candidate and teacher. The Geography Independent Investigation form requires the following details.

Candidates must sign a declaration to confirm that, apart from collaboration with other candidates and general guidance from the teacher, where these are acceptable within the parameters of the specification, the work they submit for the final assessment is their own unaided work.

Teachers must sign a declaration of authentication after the work has been completed confirming that:

- any assistance which goes beyond general guidance has been recorded and taken into account when marking the work
- otherwise, apart from general guidance given in line with the parameters set out in the specification, the work is solely that of the candidate concerned
- the work was completed under the required conditions
- signed candidate declarations are kept on file

Teachers should be sufficiently familiar with the candidate's general standard to judge whether the piece of work submitted is within his/her capabilities, and there should be sufficient supervision of every candidate to enable the work to be authenticated with confidence. Work may be completed outside the centre, without supervision, provided that the centre is confident that the work produced is the candidate's own.

A copy of the forms containing signed candidate declarations must be kept on file until the deadline for an enquiry about results has passed or until any appeal, malpractice or other results enquiry has been completed, whichever is later.

2. Investigation proposal section
Candidates must use this section to detail their title, hypothesis and/or questions and/or sub-questions, enquiry route, suggested methods of data collection and suggestions of analytical tools.

3. The WJEC Independent Investigation Marking Grid
The teacher must complete this section of the form when they mark the work, providing a mark breakdown and any supporting information.

The Geography Independent Investigation is included in Appendix E and will be available to be downloaded from the Geography homepage on the public website, together with instructions on completing the Geography Independent Investigation form.

Assessment grids and teacher annotations

Candidates' investigations must be internally assessed by centres, annotated to show how and why marks have been awarded and, if applicable, internally standardised (see below), following the procedures specified in the JCQ *Instructions for conducting non-examination assessment*. When assessing the written reports teachers should study the non-exam assessment mark bands in Appendix B, which are designed to present a system that links the assessment objectives to marks, and to discriminate clearly between the varying levels of achievement.

Teachers must make specific reference to the assessment objectives in the annotations that they write on the work and on the marking grid included with the **Geography Independent Investigation form.** Teachers are required to record separate marks for each assessment objective in the spaces provided on the marking grid, to total the overall mark in the box provided and to make an **overall** summative comment about the work. Teacher annotations on the body text of the written investigation are also very useful to show how and why the marks have been awarded. All annotations and marks must be made in ink.

The assessment grids will be of most value when used in conjunction with examples of non-exam assessment, which will be issued by WJEC to help centres identify the quality of the work associated with various mark bands. Details about the examples will be found on the Geography homepage on the public website.

Submission of marks, samples and administration

Centres need to submit **marks** for non-exam assessed work online by a date specified in **March** of the year when the work is to be submitted for moderation.

When the marks have been submitted to WJEC, the online system will identify the **sample** of candidates whose work is selected for moderation. The samples should be submitted by

the end of March. Centres must submit the **Geography Independent Investigation form**, with the sampled candidates work.

- Only the candidates selected for the sample should be sent to the moderator in rank order.
- The authentication statement on the Geography Independent Investigation form must be signed by both the candidate and the teacher.
- The Independent Investigation forms are not awarded marks. However, the moderator will use them alongside the inspection of the sample of candidates work, to judge whether the requirements have been met
- The pages of the written report must be held together securely. The study should not be placed in any form of plastic folder or ring binder.

N.B. Please remember that all candidates' work, not just the sample, must be authenticated internally by signing the Geography Independent Investigation form.

If a Geography Independent Investigation form is found to be missing, WJEC will in the first instance contact the centre to rectify the matter. If this request is not addressed satisfactorily, WJEC will take further action which may lead to a malpractice investigation.

The moderation sample of candidates' work should be sent to the external moderator by the end of March in the final spring term of the A level course. Details of the submission of samples will be available on the Geography homepage on the public website. Sample sizes are based on the following:

No. of candidates at centre	Sample size
Up to 15	All
16-100	15
101-200	20
Over 200	25

All centres will receive detailed feedback from the moderation process in the form of reports to centres, which will include advice on marking standards.

Internal standardisation and moderation

Where there is more than one teacher in a centre, work from all teaching groups must be standardised internally. This is designed to ensure that the final assessment reflects a single agreed standard for all teaching groups involved. Standardising material will be issued by WJEC to assist with this process.

For moderation to take place and to be standardised fairly, each centre is assigned an external moderator by WJEC. Moderation, including adjustments to centres' marks where necessary, will be carried out according to standard JCQ procedures. It is essential that the moderator understands the nature of the independent investigation submitted and the way that criteria have been used to make a final assessment. The required details on the Geography Independent Investigation form and the annotations made on the body of the text are therefore very important.

Please refer to details on the JCQ website for further arrangements on non-exam assessment.

3.3 Arrangements for fieldwork

Each centre must provide a Fieldwork Declaration to WJEC by end of May in the year in which the assessment is taking place, which details that the four days of fieldwork, including a focus on both physical and human geography, has been carried out by each learner. This is required in each assessment cycle. Failure to provide a fieldwork declaration will be investigated as potential malpractice and / or maladministration.

Centre Number:

Name of Head of Centre:

A Level Geography Fieldwork Statement

I, the head of centre, confirm that all students who have been entered for an A Level Geography qualification have undertaken the minimum requirement of four days of fieldwork, including fieldwork in relation to both physical and human geography processes.

Centres will be able to make the Fieldwork Declaration by downloading the form from the Geography homepage on the public website. Centres must use this form to confirm that each learner listed has undertaken geographical fieldwork on four days in both physical and human geography themes.

4 TECHNICAL INFORMATION

4.1 Making entries

This is a unitised specification which allows for an element of staged assessment.

Assessment opportunities will be available in the summer assessment period each year, until the end of the life of the specification.

Unit 1 and Unit 2 will be available in 2017 (and each year thereafter) and the AS qualification will be awarded for the first time in summer 2017.

Unit 3 and Unit 4 will be available in 2018 (and each year thereafter) and the A level qualification will be awarded for the first time in summer 2018.

A qualification may be taken more than once. However, if any unit has been attempted twice and a candidate wishes to enter the unit for the third time, then the candidate will have to re-enter all units and the appropriate cash-in(s). This is referred to as a 'fresh start'. When retaking a qualification (fresh start), a candidate may have up to two attempts at each unit. However, no results from units taken prior to the fresh start can be used in aggregating the new grade(s).

Marks for NEA units may be carried forward for the life of the specification.

If a candidate has been entered for but is absent for a unit, the absence does not count as an attempt. The candidate would, however, qualify as a resit candidate.

The entry codes appear below.

	Title	Entry codes	
		English-medium	Welsh-medium
AS Unit 1	Changing Landscapes	2110U1	2110N1
AS Unit 2	Changing Places	2110U2	2110N2
A2 Unit 3	Global Systems and Global Governance	1110U3	1110N3
A2 Unit 4	Contemporary Themes in Geography	1110U4	1110N4
A2 Unit 5	Independent Investigation	1110U5	1110N5
AS Qualification cash-in		2110QS	2110CS
A level Qualification cash-in		1110QS	1110CS

The current edition of our *Entry Procedures and Coding Information* gives up-to-date entry procedures.

There is no restriction on entry for this specification with any other WJEC AS or A level specification.

4.2 Grading, awarding and reporting

The overall grades for the GCE AS qualification will be recorded as a grade on a scale A to E. The overall grades for the GCE A level qualification will be recorded as a grade on a scale A* to E. Results not attaining the minimum standard for the award will be reported as U (unclassified). Unit grades will be reported as a lower case letter a to e on results slips but not on certificates.

The Uniform Mark Scale (UMS) is used in unitised specifications as a device for reporting, recording and aggregating candidates' unit assessment outcomes. The UMS is used so that candidates who achieve the same standard will have the same uniform mark, irrespective of when the unit was taken. Individual unit results and the overall subject award will be expressed as a uniform mark on a scale common to all GCE qualifications. An AS GCE has a total of 200 uniform marks and an A level GCE has a total of 500 uniform marks. The maximum uniform mark for any unit depends on that unit's weighting in the specification.

Uniform marks correspond to unit grades as follows:

		Unit grade				
Unit Weightings	**Maximum unit uniform mark**	**a**	**b**	**c**	**d**	**e**
Unit 1 (24%)	120	96	84	72	60	48
Unit 2 (16%)	80	64	56	48	40	32
Unit 3 (24%)	120	96	84	72	60	48
Unit 4 (16%)	80	64	56	48	40	32
Unit 5 (20%)	100	80	70	60	50	40

The uniform marks obtained for each unit are added up and the subject grade is based on this total.

		Qualification grade				
	Maximum uniform marks	**A**	**B**	**C**	**D**	**E**
GCE AS	200	160	140	120	100	80
GCE A level	500	400	350	300	250	200

At A level, Grade A* will be awarded to candidates who have achieved a Grade A (400 uniform marks) in the overall A level qualification and at least 90% of the total uniform marks for the A2 units (270 uniform marks).

APPENDIX A

Geographical skills

Geographical skills in relation to both an equal weighting of **quantitative and qualitative skills** are required for AS and A level learners and the following list indicates those selected for study for all units in this specification. All the skills need to be addressed within these units but not all will apply to fieldwork. The four required days of fieldwork should contribute to learners building a holistic and balanced understanding of quantitative and qualitative skills related to fieldwork and the six-stage enquiry process.

Quantitative skills to collect data through numerical measurements.	**Appendix A Reference Number.**
1. Cartographical information:	
• longitude and latitude	1.1
• map coordinates including grid references and area references	1.2
• distance and area	1.3
• direction	1.4
• scale	1.5
2. Number and statistical calculations:	
• sampling, including random, stratified, systematic and the ability to identify sources of error in data, measurement errors and misuse of data	2.1
• totals	2.2
• percentages	2.3
• fractions, proportions and ratios	2.4
• data sets (small to large) including crowd-sourced and big data (characterised by volume, velocity and variety)	2.5
• frequencies	2.6
• densities	2.7
• scales of measurement	2.8
• measures of central tendency (mean, median, mode)	2.9
• measures of dispersion (range, standard deviation*, inter-quartile range)	2.10
• measurements of concentration, including location quotient*	2.11
• ratios including dependency ratio and Gini-coefficient*	2.12
• indices including ecological footprint, HDI	2.13
• measures of correlation, including a scatter plot, lines of best fit and Spearman Rank*	2.14
• inferential statistics, including Chi-square*	2.15

* Calculations will not be required within written examinations for Units 1, 2, 3 and 4

3. Cartographic and graphical material:	
• isoline and isopleth maps	3.1
• choropleth maps	3.2
• dot maps	3.3
• flow diagrams and maps	3.4
• proportional symbols	3.5
• graphs, including scatter, line, bar, triangular, logarithmic, bipolar	3.6
• pie charts	3.7
• population pyramids	3.8
• cross-sections and long profiles	3.9
• rose / star / radial diagrams	3.10
• kite diagrams	3.11
• Lorenz curve	3.12
4. Digital and geo-located data:	
• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), global positioning systems (GPS), databases	4.1
Qualitative skills to collect data through non-numerical techniques	
5. Cartographical information for:	
• landscape system identification	5.1
• land-use identification	5.2
• risk assessment	5.3
6. Cartographic and graphical material:	
• mental maps	6.1
• GOAD plans	6.2
• Ordnance Survey maps (1:25 000 and 1:50 000)	6.3
7. Digital and geo-located data:	
• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), global positioning systems (GPS), databases	7.1
• field sketches	7.2
8. Textual and visual sources:	
• interview material including coding	8.1
• images	8.2
• factual text	8.3
• discursive / creative material	8.4
• oral histories	8.5

Integrating geographical skills in delivery of the core themes

Learners need to develop competence in using the geographical skills shown in italics in the tables below for each unit. The tables illustrate how the skills can be integrated into the delivery of the core themes in Units 1, 2 and 3. These skills are **not** exclusive to Units 1, 2 and 3; learners will need to be able to apply these skills across the selected non-core optional themes in Unit 4 and also in the Independent Investigation in Unit 5.

Unit 1: Changing Landscapes (Coastal or Glaciated)

The following geographical skills referred to in the table above (using reference numbers) are linked to the study of Changing Landscapes and cover both Coastal Landscapes and Glaciated Landscapes (centres choose from either Coastal Landscapes or Glaciated Landscapes). These skills are **not** exclusive to Unit 1; learners will need to be able to apply these skills across any suitable focus area throughout their course of study.

Quantitative skills to collect data through numerical measurements		
Measurement, data manipulation and statistical skills applied to field measurement		
Appendix A Reference Number	**Geographical Skill**	**Focus area in specification**
	1. Cartographical information	
1.2	• map coordinates including grid references and area references	opportunities throughout
1.3	• distance and area - calculate the maximum fetch using an atlas comparison of past and present distribution of glaciated landscapes using global and regional maps	1.1.4 1.2.4
1.4	• direction - prevailing wind and wave direction cirque orientation	1.1.4 1.2.5
1.5	• scale - trace a 30-40 km coastline at a range of scales (1: 1000 000, 1: 50 000 and 1:25 000 and comment on the influence of scale on the plan of the coastline types of ice mass at a range of scales	1.1.3 1.2.4
	2. Number and statistical calculations	
2.1	• sampling - including random, stratified, systematic - samples of beach pebbles, including the ability to identify sources of error in data, measurement errors and misuse of data samples of glacial clasts, including the ability to identify sources of error in data, measurement errors and misuse of data	1.1.6 1.2.6
2.2	• totals - use of numerical data to calculate sediment budgets and glacier mass balance	1.1.1 1.2.1
2.5	• data sets (small to large) - samples of beach pebbles samples of glacial clasts	1.1.6 1.2.6
2.6	• frequencies - record frequencies of roundness of beach pebbles record frequencies of roundness of glacial clasts using Power's scale	1.1.6 1.2.6
2.9	• measures of central tendency (mean, mode) - mean wave frequency or mean rate of cliff retreat per year by rock type modal Power's scale of beach pebbles mean rates of glacial recession in different global regions modal Power's scale of glacial clasts	1.1.4 1.1.5 1.1.6 1.2.1 1.2.6
2.10	• measures of dispersion (range, standard deviation, inter-quartile range) - calculate the range, standard deviation and interquartile range from a sample of beach pebbles calculate the range, standard deviation and interquartile range from a sample of glacial clasts	1.1.6 1.2.6
2.14	• measures of correlation, including scatter plot, lines of best fit and Spearman Rank - use scatter plot, lines of best fit and Spearman Rank to investigate changes in pebble size and shape along a drift aligned beach use scatter plot, lines of best fit and Spearman Rank to investigate changes in [scree] size along a transect from the top to the base of a scree data	1.1.6 1.2.8

2.15	• inferential statistics, including Chi-square to test the hypothesis that the distribution of observed pebble shapes between foreshore and storm ridge or size of scree deposits between the upper and lower parts of the scree is no different from an expected even distribution	1.1.6 1.2.8
	3. Cartographic and graphical material	
measurement and geo-spatial mapping skills		
3.6	• graphs, including scatter - relationship between wind speed and wave height relationship between slope angle/ice velocity/thickness and glacial erosion	1.1.4 1.2.5
3.9	• cross-sections and long profiles - cross-section of sand dune/salt marsh longshore beach profile cross-section of cirque long profile of glacial trough	1.1.7 1.1.6 1.2.5 1.2.5
3.10	• rose/star/radial diagrams - prevailing wind direction till fabric analysis using radial diagrams	1.1.4 1.2.6
	4. Digital and geo-located data	
4.1	• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), databases - use of GIS and aerial photo interpretation to measure rates of coastal retreat use of GIS and aerial photo interpretation to measure rate of glacial retreat	1.1.5 1.2.1
Qualitative skills to collect data through non-numerical techniques		
developing observation skills		
	5. Cartographical information for:	
5.1	• landscape system identification - classification of coastal and glacial landscapes according to landscape character type (LCT)	1.1.3 1.2.7
5.3	• risk assessment - for Coastal Landscapes or Glaciated Landscapes	1.1 1.2
	6. Cartographic and graphical material	
6.3	• Ordnance Survey maps (1:25,000 and 1:50,000 - map interpretation of a distinctive landform indicating past sea level [change] cirque orientation analysis using OS maps	1.1.8 1.2.5
	7. Digital and geo-located data	
7.1	• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), global positioning systems (GPS), database - GIS mapping of the variety of coastal (rocky, sandy and estuarine) landscapes both for and beyond the UK GIS mapping of landscapes shaped by valley glaciers and ice sheets both for and beyond the UK	1.1.3 1.2.4
7.2	• Field sketches - field sketches of cliff profiles field sketches of glacial landforms of erosion	1.1.5 1.2.5
	8. Textual and visual sources:	
8.2	• images - photographic interpretation of coastal landforms photo interpretation of glacial landforms	1.1 1.2

Unit 2: Changing Places

The following geographical skills referred to above (using reference numbers) are linked to the study of Changing Places. These skills are **not** exclusive to Unit 2; learners will need to be able to apply these skills across any suitable focus area throughout their course of study.

Quantitative skills to collect data through numerical measurements		
use of geo-spatial data used to present place characteristics		
Appendix A Reference Number	**Geographical Skill**	**Focus area in specification**
	1. Cartographical information	
1.2	• map coordinates including grid references and area references	opportunities throughout
	2. Number and statistical calculations:	
2.3	• percentages - percentage employed in primary, secondary and tertiary sectors	2.1.3 2.1.4
	3. Cartographic and graphical material	
	4. Digital and geo-located data	
4.1	• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), global positioning systems (GPS), database - use of GIS and aerial photo interpretation to measure land use changes in regenerated urban places	2.1.9
Qualitative skills to collect data through non-numerical techniques		
give particular weight to qualitative approaches involved in representing place and to analysing critically the impacts of different media on place meanings and perceptions		
	5. Cartographical information for:	
5.2	• land-use identification - land use changes in regenerated urban places	2.1.9
	6. Cartographic and graphical material	
6.1	• mental maps - characteristics of the "home" place	2.1.3
6.2	• GOAD plans - land uses in central urban places	2.1.9
	7. Digital and geo-located data	
7.1	• geospatial technologies including aerial photographs, digital images, satellite images, geographic information systems (GIS), global positioning systems (GPS), databases - use of GIS and aerial photo interpretation to identify land use changes in regenerated urban areas	2.1.9
	8. Textual and visual sources:	
8.1	• interview material - research how people engage with and attach to the new identities of urban places, including understanding the use of social media to obtain crowd-sourced data and coding (classifying information in preparation for computer processing – such as inputting data using Excel)	2.1.10
8.2	• images - research how media images (photographs, film, music, poetry, art, literature and graffiti) actively create particular place representations	2.1.9

8.3	• factual text - compare advertising copy and tourist agency material with census data	2.1.9
8.4	• discursive/creative material - analysing the impacts of different media on place meanings and perceptions	2.1.3
8.5	• oral histories - interpretations of oral accounts of how people's lives are/have been affected by continuity and change in the nature of places	2.1.10

Unit 3: Water and Carbon Cycles

The following geographical skills referred to in the table at the beginning of Appendix A (using reference numbers) are linked to the study of Water and Carbon Cycles. These skills are **not** exclusive to Unit 3; learners will need to be able to apply these skills across any suitable focus area throughout their course of study.

Quantitative skills to collect data through numerical measurements		
Understanding of simple mass balance, unit conversions, and the analysis and presentation of field data		
Appendix A Reference Number	**Geographical Skill**	**Focus area in specification**
	1. Cartographical information:	
1.2	• map coordinates including grid references and area references	opportunities throughout
	2. Number and statistical calculations:	
2.2	• totals - use of numerical data to calculate simple mass balance of inputs and outputs of a drainage system	3.1.2
2.4	• fractions, proportions and ratios - distribution and size of carbon stores	3.1.7
2.5	• understand use of big data for statistics on climate change	3.1.9
2.7	• densities - calculation of drainage densities	3.1.3
2.8	• unit conversions convert drainage basin from km2 to m2	
	3. Cartographic and graphical material	
3.1	• isoline and isopleth maps - construction of isohyets from precipitation data	3.1.4
3.2	• Choropleth maps - analysis of water stress/water scarcity by country	3.1.5
3.5	• proportional symbols - proportional circles to show size of carbon stores in different biomes	3.1.7
3.6	• graphs, including scatter, line, bar, triangular, logarithmic, bipolar - analysis of river regime annual discharges (bar graph) labelling features of storm hydrographs (line graph) analysis of climate graphs to identify excess runoff and deficit within the water cycle	3.1.3 3.1.3 3.1.4/5
3.11	• Kite diagrams - analysis of vegetation distribution along a peatland transect	3.1.8
Qualitative approaches may be used if appropriate		

Unit 3: Global Governance: Change and Challenges

The following geographical skills referred to in the table at the beginning of Appendix A (using reference numbers) are linked to the study of Global Governance; Change and Challenges. These skills are **not** exclusive to Unit 3; learners will need to be able to apply these skills across any suitable focus area throughout their course of study.

Quantitative skills to collect data through numerical measurements		
Use both quantitative and qualitative approaches across the theme as a whole		
Appendix A Reference Number	**Geographical Skill**	**Focus area in specification**
	1. Cartographical information:	
1.2	• map coordinates including grid references and area references	opportunities throughout
	2. Number and statistical calculations:	
2.11	• measurements of concentration - location quotient - to show differences in functions from place to place (global hubs)	3.2.2
2.12	• ratios - Gini coefficient to analyse global income inequalities	3.2.3
2.13	• indices including ecological footprint, HDI - analysis of global variation in HDI as one of the factors driving international out-migration	3.2.2
	3. Cartographic and graphical material	
3.3	• dot maps - to show distribution of piracy hotspots	3.2.6
3.4	• flow diagrams and maps - proportional flow lines showing direction and volume of global patterns of migration	3.2.1
3.7	• pie charts - to show sources of ocean pollution	3.2.10
3.8	• population pyramids - changes in population structure as a consequence of rural-urban migration in the developing world	3.2.5
3.12	• Lorenz curve - to analyse global income inequalities	3.2.3
	4. Digital and geo-located data	
Qualitative skills to collect data through non-numerical techniques		
	8. Textual and visual sources:	
8.5	• oral histories - interpretation of oral accounts of the lived experiences of refugees	3.2.4

APPENDIX B

Non-examination assessment (NEA) grids

The following assessment grid is to be applied to marking Unit 5 (non-exam assessment), the independent investigation.

	Context	Methods of field investigation	Data presentation of findings
	10 marks **AO1 (10 marks)**	**15 marks** **AO3 (15 marks)**	**10 marks** **AO3 (10 marks)**
5	**9-10 marks** • Wide ranging, and thorough use of literature sources with a confident theoretical and / or contextual background leading to a well-defined research question • Confident and informed understanding of risk / ethical issues	**13-15 marks** • Strong evidence of wide ranging and good quality data collection approaches (quantitative, qualitative method and fieldwork skills) relevant to the topic linked to a well-defined, individual research question • Practical individual and group approaches taken in the field are accurately and well explained and justified • Sampling strategy is well designed, explained and justified. The strategy is wholly appropriate to the investigation	**9-10 marks** • Wide ranging and accurate use of appropriate qualitative and / or quantitative data presentation methods / techniques • Well selected, applied and wholly appropriate cartographic and graphical techniques to support the analysis of findings
4	**7-8 marks** • Appropriate use of a range of literature sources with a secure theoretical and / or contextual background leading to defined research question • Reasonable understanding of risk / ethical issues	**10-12 marks** • Secure evidence of appropriate data collection approaches (quantitative, qualitative methods and fieldwork skills) relevant to the topic linked to a clear, individual research question • Practical individual and group approaches taken in the field are mostly accurate and explained with reasonable justification • Sampling strategy is well designed, with explanation and some justification. The strategy is mostly appropriate to the investigation	**7-8 marks** • Uses a range of suitable qualitative and / or quantitative data presentation methods / techniques • Mostly well selected and applied cartographic and graphical techniques included to support the analysis of findings
3	**5-6 marks** • Some use of literature sources with a reasonable theoretical background; no reference to research question • Partial understanding of risk / ethical issues	**7-9 marks** • Some appropriate data collection approaches are evident (quantitative, qualitative methods and fieldwork skills) and are of partial relevance to the topic linked to an adequate, individual research question • Practical individual and group approaches taken in the field shows partial accuracy with detailed description with some explanation • Sampling strategy has been considered and described. The strategy is partially appropriate to the investigation	**5-6 marks** • Some relevant qualitative and / or quantitative data presentation methods / techniques • Partially appropriate and reasonably well applied cartographic and graphical techniques to support the analysis of findings

2	**3-4 marks** • Limited use of literature sources with a generalised account of the theoretical background; no reference to research question • Limited understanding of risk / ethical issues	**4-6 marks** • Limited data collection approaches (quantitative, qualitative method and fieldwork skills) linked to an ill-defined, individual research question • Limited record of practical individual and group approaches taken in the field, with limited accuracy and description, but lacking explanation • Sampling strategy has been described. The appropriateness of the strategy to the investigation is limited	**3-4 marks** • Limited use of appropriate qualitative and / or quantitative data presentation methods / techniques • Limited use of cartographic and graphical techniques to support the analysis of findings
1	**1-2 marks** • Minimal use of literature sources and a very poor theoretical background; no reference to research question • Very little limited consideration of risk / ethical issues	**1-3 marks** • Minimal data collection approaches (quantitative, qualitative methods and fieldwork skills) with an unconvincing research and/or individual question • Very little evidence of practical individual and group approaches taken in the field with some description of the approaches taken • Sampling strategy has not been considered or described or may be inappropriate to the investigation	**1-2 marks** • Superficial use of appropriate qualitative and / or quantitative data presentation methods / techniques • Very little cartographic and graphical techniques to support the analysis of findings
	0 marks Response not creditworthy or not attempted	**0 marks** Response not creditworthy or not attempted	**0 marks** Response not creditworthy or not attempted

	Analysis and Interpretation of findings	Conclusions and Presentation requirements	Evaluation
	15 marks **AO3 (15 marks)**	**10 marks** **AO3 (10 marks)**	**20 marks** **AO2 (20 marks)**
5	**13-15 marks** • Sophisticated analysis and interpretation of findings, clearly showing why they were appropriate and relevant to the research question • Demonstrates some individuality and / or insights into links between the study and other aspects of geography	**9-10 marks** • Sophisticated and confident summary, drawing convincing and thorough individual conclusions that address the research question and substantiate the analysis and interpretation • A well-structured, concise and logical report; accurately references secondary information • Spelling, punctuation and grammar used with a very high degree of accuracy	**17-20 marks** • Highly effective evaluation of the knowledge and understanding gained from field observation • Perceptive evaluation of each stage of the fieldwork investigation including the ethical dimensions of the field research • Perceptive and well considered reflections for further research and extension of their geographical understanding • Considered improvements suggested pertinent to the investigation
4	**10-12 marks** • Well-developed analysis and interpretation of findings, showing why they were appropriate and relevant to the research question • Demonstrates partial insights into links between the study and other aspects of geography	**7-8 marks** • Effective summary, drawing competent individual conclusions that address the research question and substantiate the analysis and interpretation • A structured, clear and concise report; accurately references secondary information • Spelling, punctuation and grammar used with a high degree of accuracy	**13-16 marks** • Effective evaluation of the knowledge and understanding gained from field observation • Competent evaluation of each stage of the fieldwork investigation including the ethical dimensions of the field research • Valid reflections for further research and extension of their geographical understanding • Valid improvements suggested pertinent to the investigation
3	**7-9 marks** • Straightforward analysis and interpretation of findings, largely showing why they were appropriate and relevant to the research question • Implied insights into links between the study and other aspects of geography	**5-6 marks** • Summarises, drawing individual conclusions that mainly address the research question and largely substantiate the analysis and interpretation • A structured and clear report with some lack of focus; some references of secondary information • Spelling, punctuation and grammar used with a good degree of accuracy	**9-12 marks** • Attempts to evaluate the knowledge and understanding gained from field observation • Intermittent evaluation of each stage of the fieldwork investigation occasionally including the ethical dimensions of the field research • Some reflections for further research and extension of their geographical understanding • Some improvements suggested pertinent to the investigation

2	**4-6 marks** • Limited analysis and interpretation of findings, occasionally showing why they were appropriate to the research question • Limited insights into links between the study and other aspects of geography	**3-4 marks** • Provides rudimentary conclusions that are occasionally linked back to the research question • A structured and imprecise report; a few superficial references to secondary information, solely from the web • Spelling, punctuation and grammar used with a reasonable degree of accuracy	**5-8 marks** • Limited evaluation of the knowledge gained from field observation • Evaluation of some stages of the fieldwork investigation • Some random improvements suggested to the investigation
1	**1-3 marks** • Very superficial and / or biased analysis and interpretation of findings, lacking appropriateness to the research question • No insight into links between the study and other aspects of geography	**1-2 marks** • An inadequate summary of findings rarely linked to the research question • Produces written report that lacks structure; references are missing or disorganised • Spelling, punctuation and grammar used with limited accuracy	**1-4 marks** • Unjustified evaluation of the knowledge gained from field observation • Unsupported evaluation of some stages of the fieldwork investigation • Very limited suggested improvements to the investigation
	0 marks Response not creditworthy or not attempted	**0 marks** Response not creditworthy or not attempted	**0 marks** Response not creditworthy or not attempted

APPENDIX C

Opportunities for fieldwork

Opportunities for fieldwork
The following list provides suggestions of fieldwork opportunities that may be carried out in relation to each theme; these suggestions are designed as guidance in order to provide starting points and are neither comprehensive nor mandatory.

Suggestions where the field element is in brackets may be studied using either primary or secondary data.

Unit 1: Changing Landscapes

Coastal Landscapes

- Field survey of wave characteristics (wave height, frequency, wavelength) along a stretch of coast
- Field survey of changing erosion and deposition on a stretch of coast before and after a storm to look at the impact of processes on coastal features (possibly using previous field work records)
- Field survey of raised beaches to look at their distribution, height and post-glacial modifications
- Mapping areas of weathering and mass movement and their relationship to geology maps
- Field survey of coastal erosion features: cliff height and profiles (hard rock / soft rock contrasts), mapping of incidence of faults, joints, and bedding planes to study the distribution of micro features e.g. caves, arches and stacks and the relationship between erosional features and geology maps
- Field survey of beach profiles: long and cross transects to map changes in beach material, gradient, pebble length (long axis) and pebble roundness along a transect from low to high tide and across the width of the beach (linking to the process of longshore drift)
- Field survey of a single or double spit using a range of transects to study shape, size and type of deposits on windward and lee sides (linking to the process of longshore drift)
- Field survey of sand dunes using transects to show dune topography, plant zonation and succession
- Field survey of a salt marsh using transects to show salt marsh topography, plant zonation and succession
- Field survey of impact of humans on coastal environments - foot path erosion, trampling of dunes, beach litter (in and out of season, before or after each clean up)
- Field survey of coastal management schemes along a stretch of coast threatened by either erosion or flooding to investigate the impact of management structures on sediment transfer e.g. groynes; undertake cost benefit analysis or study shoreline management plans

Glaciated Landscapes

- Field survey of size (height of back wall etc.) shape, orientation and distribution of corries in a defined area
- Field survey of distribution and characteristic features of a glaciated valley (long and cross sections, occurrence of striations, distribution of erosional and depositional features, post glacial modifications)
- Field survey of distribution and formation of depositional features (glacial v fluvio-glacial deposit analysis – size, shape, stratification) in an area of lowland ice sheet glaciation
- Field survey of size, distribution, shape and stoss end orientation of a drumlin swarm (‘basket of eggs’ topography)
- Field survey of scree to measure slope, degree of sorting, mapping of source and extent of scree and vegetation colonisation to assess if scree is an active or fossil feature
- Field survey of glacial till: till fabric analysis (situation, orientation and shape) to map provenance and movement of ice in a defined area
- Field survey of kettle holes / lakes to investigate succession (hydrosere)
- Field survey of vegetation succession on moraines (lithosere in an area of glacier retreat)
- Field survey of discharge from meltwater streams (currently glaciated environment)
- Survey of glacier mass balance (currently glaciated environment)

Unit 2: Changing Places

- Visual survey of variations in townscape / landscape
- Internet perception survey of place / region e.g. contrasts in safety (day and night)
- Field survey of changing service provision in villages
- Field survey of changes in or characteristics of suburbanised villages: population size and structure, employment characteristics, housing and community spirit
- Field survey of changes in rural areas associated with rural change: holiday homes, language issues, population size and structure, employment and house prices and problems of service provision
- Field survey of building age, type and quality for evidence of gentrification
- Field survey of the social characteristics and service structure of inner cities
- Field survey of employment changes (quality and number of jobs) in Development Area / Enterprise zones
- Field survey of central areas of a city to look at changes in land use, quality of the environment, footfall and characteristics of cultural quarters
- Field survey of central areas of a city to identify the 'core' and 'frame', zones of assimilation and discard
- Field survey of student districts in urban areas: population characteristics, service provision, attitudes of local residents and housing quality/tenure
- Field survey of variations in ethnicity within urban areas
- Field survey of variations in levels of deprivation in urban areas: environmental quality, unemployment rates, crime levels, housing tenure, council tax bands, benefit uptake
- Field survey of the environmental quality of purpose built business parks
- Field survey of the environmental, social and economic impacts of a single, large tertiary employers eg a hospital complex
- Field survey of impact of tourism on honey pot sites
- For urban or rural re-branding – assessment of the success of flagship projects e.g. sports sites, festival sites, tourism projects to assess environmental, economic, social and cultural impacts
- For any rebranding / regeneration projects – assessment of their sustainability in terms of linkage and involvement to local community, conflicts, economic success, quality of jobs, impact on poor people in an area and likelihood of being value for money and a permanent success

Unit 3: Global Systems

Water and Carbon Cycles

- Field measurements of infiltration rate variations due to soil type, vegetation, relief and antecedent conditions
- Field measurements of river discharge
- Field measurements of throughfall
- Field survey of drainage basin characteristics: land use, vegetation, slope, soil permeability / infiltration and their impact on river discharge
- Field survey to compare the characteristics of two drainage basins
- Field measurements of discharge over selected times in a year to look at river regimes in relation to season
- Field measurements of a minor storm event and its impact on discharge in a small stream catchment
- (Field) survey to investigate flooding recurrence levels and areas of flood risk/ vulnerability (GIS)
- (Field) survey of the impact of a sustained period of drought on water supply and water use, vegetation, sales of summer products (ice creams, salads) and summer activities
- Field survey of the impact of a single extreme weather event
- Phenology studies to look at climate change on natural and human activities (appearance of catkins or snowdrops, first and last marking of lambs, putting sheep inside / lambing etc.)
- (Field) survey of the impact of human activity (urbanisation, agriculture and deforestation/afforestation) in drainage basins
- Field survey to investigate biomass and leaf litter (organic carbon) loss from a drainage basin in relation to rainfall runoff
- Field measurements of dissolved (solute) and / or particulate organic carbon carried by water (using filters or making observations about water colour, etc.)

Global Governance: Change and Challenges

- (Field) survey of the impact of migration on a particular community: provision of shops, services, schools, places of worship, distribution of groups, housing types, employment, official services (language), index of segregation
- (Field) survey of the distribution of ethnic food outlets and restaurants in a designated area
- (Field) survey of variations in ethnicity within urban areas
- Field survey of variations in levels of deprivation in an urban with a high proportion of immigrants: environmental quality, unemployment rates, crime levels, housing tenure, council tax bands, benefit uptake
- Survey of how people use social networks to maintain contact with families
- Field survey of beach to look at distribution and type of sea borne materials (after a storm and post clean up) as well as land supplied litter and waste
- (Field) survey of impact of EU fishing policies on the fishing industry of a designated port (numbers employed, catch levels, fishing related industries)
- (Field) survey of water quality and management of water quality in coastal areas (blue flag beaches)
- (Field) survey of threatened coastal environments (eg sea horse breeding grounds at Studland)

Unit 4: Contemporary Themes in Geography

Optional Themes

Ecosystems

- Field survey of local nature reserves such as SSSI, RSPB reserves to research reasons for designation, viability, sustainability issues or on the quality and biodiversity of the reserve
- Investigation of Biological Action Plans to assess success of work of local conservation organisations such as wildlife trusts
- Field survey of the threats to and impacts on ecosystems from tourism
- Field survey of sand dunes using transects to show dune topography, plant zonation and succession studying changes in physical features (infiltration, pH, wind speed, % of bare ground) and associated changes in biotic characteristics (% plant cover, species diversity, plant height) (psammosere)
- Field survey of impact of trampling on vegetation (% plant cover, species diversity, plant height)
- Field survey of salt marsh using transects to show salt marsh topography, plant zonation and succession studying changes in physical features (soil type, pH) and associated changes in biotic characteristics (% plant cover, species diversity, plant height) (halosere)
- Field survey of succession on margins of a small lake (hydrosere)
- Field survey of the effects of burning on heathland / moorland ecosystems
- Field survey of woodland management
- Field survey of conflicts associated with urban development on fragile environments
- Field survey of ecosystem management schemes including cost benefit analysis

Economic Growth and Challenge: either India or China or Development in Sub-Saharan Africa

Economic Growth and Challenge: either India or China

- Survey of impact of FDI eg Tata in W Midlands, Chinese development around Manchester airport
- Survey of impact of Chinese or Indian diaspora in a named area

Development in Sub-Saharan Africa

- Investigation of the characteristics and effectiveness of a strategy designed to address the causes of desertification
- Investigation of the characteristics and effectiveness of a strategy designed to manage the consequences of desertification
- Investigation of the impact of a micro-finance scheme on a local community

Energy Challenges and Dilemmas

- Survey of impact of thermal power station (oil and coal fired) on local microclimate, water air pollution levels, transport movements and employment
- Survey of social, environmental and economic impact of nuclear power station on designated area
- Survey of impact of energy efficiency measures on a named community, to include recycling, use of solar panels
- Survey of impact / potential impact of solar energy farm on neighbourhood
- Investigation of potential sites for location of wind farms
- Survey of impact of coalmining on a former mining area, exploring image, culture, health issues and environment, socio-economic impact and measures to rebrand
- Survey of environmental impacts of alternative energy schemes, eg wind farms, solar energy farms
- Survey of potential impact of a new power station

Weather and Climate

- Field survey of urban microclimate – measuring temperature, relative humidity, wind strength, light intensity along a transect from the inner-city to the suburbs recording building height and land use changes
- Field survey of perception of the characteristics and impacts of a climatic hazard (drought, storm)
- Field survey of changing weather in a selected area over time

APPENDIX D

Independence in the Independent Investigation

The table below describes the level of independence that candidates must follow in every stage of the Independent Investigation.

Investigation stage	What is the level of independence expected?	What does this level of independence mean in practice at this stage? (The following is not exhaustive)	What are the potential risks?	What controls are in place to mitigate these risks?
Exploring focus	Collaboration allowed	Centres may want to give candidates a free choice of investigations focusing on any of the compulsory or optional content or they may wish to provide candidates with a theme or a range of themes. However, it is not acceptable for candidates to choose from a list of titles or investigations provided by the centre. Candidates may discuss together, and with their teacher, ideas and research for appropriate geographical questions.	The parameters that the centre provides may not allow sufficient scope for candidates to independently derive their titles. The title which a candidate chooses may not provide sufficient scope for candidates to access the full range of marks available for the NEA.	Instructions that teachers give must ensure that scope is sufficient for candidates to arrive at their titles independently. The viability of a candidate's potential title can be discussed with the teacher. Training as to good practice with regard to investigation titles and teacher feedback. Any guidance that goes beyond general guidance must be recorded by the teacher on the Geography Independent Investigation form and taken into account when the work is marked.
Task, title of the investigation, focus of investigation (sub-questions), purpose of investigation.	Independent work	Following the first stage candidates must finalise the draft title of their investigation. This must be done by each candidate on his/her own. On the Geography Independent Investigation form and final written report, candidates must provide a clear justification and contextualisation of how their enquiry will help them to address their title and explore their theme in relation to the chosen geographical location.	The investigation proposal may not provide sufficient scope for candidates to access the full range of marks available for the NEA. There is plagiarism of titles.	Teacher approval of investigation proposals to ensure that each candidate has independently devised his/her own hypothesis, and/or questions and/or sub-questions even though the title may be the same as/similar to another candidate's. If candidates do not fully justify and contextualise their enquiry they may limit access to marks. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by the teacher on the Geography Independent Investigation form and taken into account when the work is marked. Moderators will be instructed to report any suspected instances of plagiarism or candidates not working independently for further investigation.

Devising methodology and sampling framework	Collaboration allowed	Candidates may collaborate when planning and selecting methodologies/sampling strategies.	Plagiarism of the methodology sampling framework. Candidate plans and selects a methodology that is inappropriate. This may include a methodology that is not achievable, that the candidate does not understand or carries potential health and safety or ethical risks.	Teacher approval of investigation proposal to ensure that candidates have appropriate methodology and sampling strategies. If candidates do not fully justify their methodology and sampling they may limit access to marks. Teacher assessment of candidate work which takes into account any guidance that goes beyond general guidance. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked.
Primary data collection	Collaboration allowed	Primary data collection may be carried out individually or in groups.	A candidate does not collect any primary data. The data is plagiarised from another candidate.	No evidence of candidate's own collection of data in the investigation and is therefore taken into account when the work is marked by the teacher. Teacher assessment of candidate work. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked.

Investigation stage	**What is the level of independence expected?**	**What does this level of independence mean in practice at this stage? (The following is not exhaustive)**	**What are the potential risks?**	**What controls are in place to mitigate these risks?**
Secondary data collection (if relevant)	Independent work	Must be carried out independently. Candidates select secondary sources of data on their own.	Candidates plagiarise their work from others using resources given to them by others such as peers, parents or teachers Candidates attempt to obscure plagiarism by failing to reference.	Teacher assessment of candidate work, which takes into account work that has not been completed independently. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked. Moderators will be instructed to report any suspected instances of plagiarism or candidates not working independently for further investigation.
Data / information presentation	Independent work	Candidates select and use appropriate data presentation methods on their own.	Candidates plagiarise their work from others.	Teacher assessment of candidate work, which takes into account work that has not been completed independently. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked. Moderators will be instructed to report any suspected instances of plagiarism or candidates not working independently for further investigation.
Data analysis and explanation / interpretation	Independent work	Candidates select and use appropriate data analysis techniques and independently interpret and analyse the results on their own.	Candidates plagiarise their work from others.	Teacher assessment of candidate work, which takes into account work that has not been completed independently. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked. Moderators will be instructed to report any suspected instances of plagiarism or candidates not working independently for further investigation.

Conclusions and evaluation	Independent work	Candidates evaluate the findings of their investigation and reach a balanced and supported conclusion on their own.	Candidates plagiarise their work from others.	Teacher assessment of candidate work, which takes into account work that has not been completed independently. Teacher and candidate declaration that the work is the candidate's own. Any guidance that goes beyond general guidance must be recorded by teacher on the Geography Independent Investigation form and taken into account when the work is marked. Moderators will be instructed to report any suspected instances of plagiarism or candidates not working independently for further investigation.

Detecting malpractice

- the style of writing is not typical of the candidate; it might be from published material, be the style of another person
- there are instances of the same errors in the work of two or more candidates
- there are passages quoted from publications or the internet which are not acknowledged in the bibliography or by in-text referencing
- there are passages copied from examples of good practice which were distributed to the whole class
- the work of one candidate is copied from another

Dealing with malpractice

If the centre / teacher suspects some form of malpractice, the following apply:

- If the centre / teacher suspects some form of malpractice, the centre must take action to investigate internally. The centre should have in place procedures to deal with these issues across qualifications.

- The candidate and teacher should only complete the authentication section of the Geography Independent Investigation form once it is clear which parts of the work are the candidate's own. If the matter is not resolved the candidate should be awarded zero.

APPENDIX E

Geography Independent Investigation form

Section 1 - Candidate/teacher authentication

Please attach the form to your candidate's work and keep it at the centre or send it to the moderator as required. The declarations should be completed by the candidate and teacher as indicated

Centre Number: **Centre Name:**

Candidate Number: **Candidates full name:**

Work submitted for assessment **must** be the candidate's own. If candidates copy work, allow candidate to copy from them, or cheat in any way, they may be disqualified.

Candidate declaration
Have you read the JCQ regulations – information for candidates?

☐ No ☐ Yes

Have you received help / information from anyone **other than** subject teacher(s) to produce this work?

☐ No ☐ Yes (give details below or on a separate sheet, if necessary)

Please list below any books, leaflets or other materials (e.g. DVDs, software packages, Internet information) used to complete this work **not** acknowledged in the work itself. Presenting materials copied from other sources **without acknowledgement** is regarded as deliberate deception.

I declare that, apart from collaboration with other candidates and general guidance from the teacher, where these are acceptable within the parameters of the specification, this is my own unaided work.

Candidate signature:	**Date:**

Teacher declaration:

I declare that:

- any assistance which goes beyond general guidance has been recorded and taken into account when marking the work;
- otherwise, apart from general guidance given in line with the parameters set out in the specification, the work is solely that of the candidate concerned;
- the work was completed under the required conditions;
- signed candidate declarations will be kept on file.

Teacher signature:	**Date:**

Candidate's full name:	**Candidate Number:**

Details of additional assistance given

Record here details of any assistance given to this candidate which is beyond that given to the class as a whole and beyond that described in the specification (*continue on a separate sheet if necessary*).

Any additional support must be taken into account when marking the candidates work. You must indicate via your annotations where you have taken into account the additional support provided. If any additional support was provided during the planning stage this must be indicated on the candidate proposal form.

Concluding comments:

Section 2 – Independent Investigation Proposal

<table>
<tr><td>Candidate Name:</td><td>Candidate Number:</td><td>Examination series:</td></tr>
<tr><td colspan="2">Centre Name:</td><td>Centre Number:</td></tr>
<tr><td>Investigation Title:</td><td colspan="2">How the title links to the specification content.</td></tr>
<tr><td colspan="3">Planned investigation hypothesis or question /sub-questions:</td></tr>
<tr><td colspan="2">Investigation focus - indication of how the enquiry will enable the candidate to address their investigation title and explore their theme in relation to the chosen geographical area</td><td>Individual/Group data collection (delete as appropriate):</td></tr>
<tr><td colspan="3">Proposed methodology – indication of quantitative and/or quantitative techniques including primary and, if relevant, secondary data collection techniques, indication of the planned sampling strategy or strategies:</td></tr>
<tr><td colspan="2">Teacher signature:</td><td>Date:</td></tr>
</table>

Total mark 80

Section 3 – Independent Investigation Mark Sheet

The following assessment grid is to be applied to marking Unit 5 (non-exam assessment), the independent investigation.

	Context 10 marks AO1 (10 marks)	Mark given	Methods of field investigation 15 marks AO3.1 (15 marks)	Mark given	Data presentation of findings 10 marks AO3.3 (10 marks)	Mark given
5	**9-10 marks** • Wide ranging, and thorough use of literature sources with a confident theoretical and / or contextual background leading to a well-defined research question • Confident and informed understanding of risk / ethical issues		**13-15 marks** • Strong evidence of wide ranging and good quality data collection approaches (quantitative, qualitative method and fieldwork skills) relevant to the topic linked to a well-defined, individual research question • Practical individual and group approaches taken in the field are accurately and well explained and justified • Sampling strategy is well designed, explained and justified. The strategy is wholly appropriate to the investigation		**9-10 marks** • Wide ranging and accurate use of appropriate qualitative and / or quantitative data presentation methods / techniques • Well selected, applied and wholly appropriate cartographic and graphical techniques to support the analysis of findings	
4	**7-8 marks** • Appropriate use of a range of literature sources with a secure theoretical and / or contextual background leading to defined research question • Reasonable understanding of risk / ethical issues		**10-12 marks** • Secure evidence of appropriate data collection approaches (quantitative, qualitative methods and fieldwork skills) relevant to the topic linked to a clear, individual research question • Practical individual and group approaches taken in the field are mostly accurate and explained with reasonable justification • Sampling strategy is well designed, with explanation and some justification. The strategy is mostly appropriate to the investigation		**1-3 marks** • Uses a range of suitable qualitative and / or quantitative data presentation methods / techniques • Mostly well selected and applied cartographic and graphical techniques included to support the analysis of findings	
3	**5-6 marks** • Some use of literature sources with a reasonable theoretical background; no reference to research question • Partial understanding of risk / ethical issues		**7-9 marks** • Some appropriate data collection approaches are evident (quantitative, qualitative methods and fieldwork skills) and are of partial relevance to the topic linked to an adequate, individual research question • Practical individual and group approaches taken in field shows partial accuracy with detailed description and some explanation • Sampling strategy has been considered and described. The strategy is partially appropriate to the investigation		**5-6 marks** • Some relevant qualitative and / or quantitative data presentation methods / techniques • Partially appropriate and reasonably well applied cartographic and graphical techniques to support the analysis of findings	

2	**3-4 marks** • Limited use of literature sources with a generalised account of the theoretical background; no reference to research question • Limited understanding of risk / ethical issues		**4-6 marks** • Limited data collection approaches (quantitative, qualitative method and fieldwork skills) linked to an ill-defined, individual research question • Limited record of practical individual and group approaches taken in the field, with limited accuracy and description, but lacking explanation • Sampling strategy has been described. The appropriateness of the strategy to the investigation is limited		**3-4 marks** • Limited use of appropriate qualitative and / or quantitative data presentation methods / techniques • Limited use of cartographic and graphical techniques to support the analysis of findings	
1	**1-2 marks** • Minimal use of literature sources and a very poor theoretical background; no reference to research question • Very little limited consideration of risk / ethical issues		**1-3 marks** • Minimal data collection approaches (quantitative, qualitative methods and fieldwork skills) with an unconvincing research and/or individual question • Very little evidence of practical individual and group approaches taken in the field with some description of the approaches taken • Sampling strategy has not been considered or described or may be inappropriate to the investigation		**1-2 marks** • Superficial use of appropriate qualitative and / or quantitative data presentation methods / techniques • Very little cartographic and graphical techniques to support the analysis of findings	
	0 marks Response not creditworthy or not attempted		**0 marks** Response not creditworthy or not attempted		**0 marks** Response not creditworthy or not attempted	

	Analysis and Interpretation of findings	Mark given	Conclusions and Presentation requirements	Mark given	Evaluation	Mark given
	15 marks **AO3.2 (15 marks)**		**10 marks** **AO3.3 (10 marks)**		**20 marks** **AO2.1c (20 marks)**	
5	**13-15 marks** • Sophisticated analysis and interpretation of findings, clearly showing why they were appropriate and relevant to the research question • Demonstrates some individuality and / or insights into links between the study and other aspects of geography		**9-10 marks** • Sophisticated and confident summary, drawing convincing and thorough individual conclusions that address the research question and substantiate the analysis and interpretation • A well-structured, concise and logical report; accurately references secondary information • Spelling, punctuation and grammar used with a very high degree of accuracy		**17-20 marks** • Highly effective evaluation of the knowledge and understanding gained from field observation • Perceptive evaluation of each stage of the fieldwork investigation including the ethical dimensions of the field research • Perceptive and well considered reflections for further research and extension of their geographical understanding • Considered improvements suggested pertinent to the investigation	
4	**10-12 marks** • Well-developed analysis and interpretation of findings, showing why they were appropriate and relevant to the research question • Demonstrates partial insights into links between the study and other aspects of geography		**7-8 marks** • Effective summary, drawing competent individual conclusions that address the research question and substantiate the analysis and interpretation • A structured, clear and concise report; accurately references secondary information • Spelling, punctuation and grammar used with a high degree of accuracy		**13-16 marks** • Effective evaluation of the knowledge and understanding gained from field observation • Competent evaluation of each stage of the fieldwork investigation including the ethical dimensions of the field research • Valid reflections for further research and extension of their geographical understanding • Valid improvements suggested pertinent to the investigation	
3	**7-9 marks** • Straightforward analysis and interpretation of findings, largely showing why they were appropriate and relevant to the research question • Implied insights into links between the study and other aspects of geography		**5-6 marks** • Summarises, drawing individual conclusions that mainly address the research question and largely substantiate the analysis and interpretation • A structured and clear report with some lack of focus; some references of secondary information • Spelling, punctuation and grammar used with a good degree of accuracy		**9-12 marks** • Attempts to evaluate the knowledge and understanding gained from field observation • Intermittent evaluation of each stage of the fieldwork investigation occasionally including the ethical dimensions of the field research • Some reflections for further research and extension of their geographical understanding • Some improvements suggested pertinent to the investigation	

2	**4-6 marks** • Limited analysis and interpretation of findings, occasionally showing why they were appropriate to the research question • Limited insights into links between the study and other aspects of geography		**3-4 marks** • Provides rudimentary conclusions that are occasionally linked back to the research question • A structured and imprecise report; a few superficial references to secondary information, solely from the web • Spelling, punctuation and grammar used with a reasonable degree of accuracy		**5-8 marks** • Limited evaluation of the knowledge gained from field observation • Evaluation of some stages of the fieldwork investigation • Some random improvements suggested to the investigation	
1	**1-3 marks** • Very superficial and / or biased analysis and interpretation of findings, lacking appropriateness to the research question • No insight into links between the study and other aspects of geography		**1-2 marks** • An inadequate summary of findings rarely linked to the research question • Produces written report that lacks structure; references are missing or disorganised • Spelling, punctuation and grammar used with limited accuracy		**1-4 marks** • Unjustified evaluation of the knowledge gained from field observation • Unsupported evaluation of some stages of the fieldwork investigation • Very limited suggested improvements to the investigation	
	0 marks Response not creditworthy or not attempted		**0 marks** Response not creditworthy or not attempted		**0 marks** Response not creditworthy or not attempted	

APPENDIX F

A Level Geography NEA teacher guidance

This table is about demonstrating what is considered to be specific guidance and what is considered to be general guidance. Specific guidance can constitute malpractice in certain circumstances and must always be recorded and taken into account when marking candidates' investigations.

Investigation stage	***Specific guidance***	***General guidance***	***Reasoning***
Exploring focus	• Give candidates a list of titles from which to choose • Give candidates an area of specification content they must focus on in their investigation.	• Discuss specification content to find potential themes and relevance for an investigation • Broadly outline the stages of the investigation, mark scheme expectations and the Geography Independent Investigation form.	• Teaches will need to provide an introduction to candidates. This could include detailing the equipment available from the school and/or describing expectations of the NEA through the mark scheme • The investigation must be an independent piece of work by the candidate so teachers shouldn't be giving candidates direct information such as titles.
Title of the investigation, focus of investigation (sub-questions), purpose of investigation	• Give candidates a list of titles from which to choose • Make significant changes to a candidates title so it is re-written • Give candidates or make strong suggestions about the sub-questions • Tell candidates what the purpose of the investigation is so they all have similar approach / idea and this is reflected in their draft / final investigation write up • Suggest that groups of candidates work on the same title but with minor changes such as an area reference • Suggest that candidates use the same title but with different sub-questions.	• Explore and discuss with candidates what makes a good title for an investigation and the value / importance of breaking this down into sub-questions • Direct candidates to material produced by exam boards on what makes a good title • Give candidates an example title to critique and amend which is unrelated to any investigations a candidate may be interested in pursuing.	• The teacher acts as the facilitator, encouraging candidates to plan their investigations and to 'read around' to get to grips with their title and sub-questions • The teacher provides opportunities for candidates to set themselves up as independent learners through general discussions around the title, sub-questions, choosing a geographical area of study.

Devising methodology and sampling framework	• Give candidates individual data collection technique suggestions relevant to their own investigation • Tell candidates which sampling technique to use for their individual investigation.	• Outline a range of fieldwork / data collection techniques relevant to human and physical investigations • Provide opportunities for candidates to explore through literature and online resources a variety of data collection techniques • Provide opportunities for candidates to research and reflect on sampling techniques appropriate to their investigation • Encourage candidates to plan their methodology thinking about why particular techniques for data collection / sampling have been chosen and what they want / expect to find out.	• Teachers should not be giving candidates suggestions for their methodology or giving them sampling techniques to try as this takes ownership of the investigation away from the candidate and discourages them from being independent • The teacher acts as facilitator, encouraging candidates to plan their data collection and find out about techniques relevant to their own individual investigation.
Primary data collection	• Teach and guide candidates through each data collection technique relevant to their individual investigation • Take a whole class/es on a fieldtrip and teach them all the same primary data collection techniques specific to an investigation or narrow range of investigations (such as coasts fieldwork where candidates may be taught the same data collection techniques for longshore drift, beach profiles and sediment sampling whereby ownership is taken away from candidates as they all have access to the same information and data sets) • Produce fieldwork information on primary data collection techniques specific to individual candidate titles (such as coasts working through a narrow range of primary data collection techniques specific to individual titles, as outlined in the preceding bullet point)	• Outline and discuss with candidates what makes 'good' / valuable primary data • Provide opportunities for candidates to explore a range of data collection techniques, suggesting candidates use several techniques in their investigation, in order to ascertain what works well / doesn't as part of their evaluation • Suggest candidates work in small groups with similar topic areas to collect primary data as a larger sample of data can potentially be collected.	• The teacher acts as the facilitator, encouraging candidates to plan their data collection and find out about techniques relevant to their own individual investigation • Teachers as facilitators encourage candidates to 'read around' and discuss data collection techniques so that candidates can independently justify their choices of primary data collection and evaluate the success of those choices • Teachers can suggest candidates work collaboratively in small groups with similar topic areas to collect primary data. This does not however prevent candidates from collecting additional data pertinent to their individual investigations.