



General Certificate of Secondary Education
2016

Geography
Unit 1:
Understanding Our Natural World
Higher Tier
[GGG12]
TUESDAY 24 MAY, AFTERNOON

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses. The mark schemes should be read in conjunction with these general marking instructions.

Assessment objectives

Below are the assessment objectives for GCSE Geography.

Candidates must show they are able to:

- recall, select and communicate their knowledge and understanding of places, environments and concepts (AO1);
- apply their knowledge and understanding in familiar and unfamiliar contexts (AO2); and
- select and use a variety of skills, techniques and technologies to investigate, analyse and evaluate questions and issues (AO3).

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 15- or 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If the answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range of any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 15- or 16-year-old GCSE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

Levels of response

Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

Marking calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

Quality of written communication

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is limited

Level 2: Quality of written communication is satisfactory

Level 3: Quality of written communication is of a high standard.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below.

Level 1 (Limited): Candidates present some relevant information in a form and using a style of writing which suits its purpose. The text is reasonably legible. Spelling, punctuation and the rules of grammar are used with some accuracy so that meaning is reasonably clear. A limited range of specialist terms is used appropriately.

Level 2 (Satisfactory): Candidates present relevant information in a form and using a style of writing which suits its purpose. The text is legible. Spelling, punctuation and the rules of grammar are used with considerable accuracy so that meaning is clear. A good range of specialist terms is used appropriately.

Level 3 (High Standard): Candidates present, and organise effectively, relevant information in a form and style of writing which suits its purpose. The text is fluent and legible. Spelling, punctuation and the rules of grammar are used with almost faultless accuracy so that meaning is clear. A wide range of specialist terms is used skillfully and with precision.

Assessment of spelling, punctuation and the accurate use of grammar.

Marks for spelling, punctuation and the accurate use of grammar will be allocated to specific questions where there is a requirement for sufficient extended writing to enable the accurate application of Performance descriptions (see below). These marks will be identified to candidates on the question papers.

Performance descriptions

(i) Threshold performance

Candidates spell, punctuate and use the rules of grammar with reasonable accuracy in the context of the demands of the question. Any errors do not hinder meaning in the response. Where required, they use a limited range of specialist terms appropriately.

(ii) Intermediate performance

Candidates spell, punctuate and use the rules of grammar with considerable accuracy and general control of meaning in the context of the demands of the question. Where required, they use a good range of specialist terms with facility.

(iii) High performance

Candidates spell, punctuate and use the rules of grammar with consistent accuracy and effective control of meaning in the context of the demands of the question. Where required, they use a wide range of specialist terms adeptly and with precision.

As shown by the performance descriptions, SPaG marks are awarded in the context of the demands of the question. If the candidate's response does not address the question then no SPaG marks are available. However, if the candidate has attempted to answer the question but produced nothing of credit, SPaG marks may still be awarded.

Theme A: The Dynamic Landscape

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- 1 (a) (i) Complete **Table 1** to provide the key for **Fig. 1**.

Award [1] for each correct answer

Key	
1	Confluence
2	Watershed
3	Tributary (Given)

[2]

- (ii) Explain the impact of this mature forest on river discharge.

Accept answers which refer to reduction in flood peak or reduction in total discharge.

Award [0] for a response not worthy of credit.

Level 1 ([1])

A limited explanation which makes slight reference to the role that additional trees might play in the discharge within the drainage basin, e.g. Less discharge/less water in the river.

Level 2 ([2]–[3])

An explanation which makes clear reference to the role that additional trees might play in reducing the discharge within the drainage basin, e.g. An increase in the amount of trees will increase the amount of water being taken up through the tree roots lowering discharge. [2]
The trees will store the water and it will be transpired. [3]

Level 3 ([4])

A detailed explanation which refers to the role that additional trees play in affecting the discharge and includes at least 2 key words such as surface runoff, infiltration, transpiration and interception, e.g. Increasing the amount of trees in this area will help to reduce river discharge. When the trees have matured, they will intercept water from the drainage basin through their root system and will then store water and release it through transpiration. This reduces discharge. [4]

- (b) (i) Using **Table 2** describe changes in depth across the river channel.

Award [0] for a response not worthy of credit.

If units of measurements not stated award [1].

Award [1] for a basic answer which might not quote any figures from **Table 2** or might quote only one figure, e.g. The river is deepest on the outside bend/near Y/at C/on the right.

Award [2] for an answer that makes reference to the fact that the river gets deeper towards one side and has quoted at least 2 figures (with units),

e.g. The river gets deeper towards place C.

The river here is 0.41m but it is much shallower at place A where it is 0.21m deep. The middle of the river is 0.33m deep. [2]

- (ii) Describe the relationship between depth and velocity across this river meander.

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Award [0] for a response not worthy of credit.

Award [1] for a basic statement of the relationship between depth and velocity. There might be no use of figures or there might be a lack of understanding of the relationship,
e.g. There is a positive relationship/as the depth of the river increases, the velocity also increases.

Award [2] for a response that recognises the relationship between depth and velocity and includes **one set** of figures to support the answer, (i.e. 2 figures)

Award [2] if no units of measurement stated.

e.g. There is a positive relationship – the depth is 0.41 m and this has the fastest velocity (0.55 m/sec.).

Award [3] for a response that recognises the relationship between depth and velocity and includes **two sets** of figures to support the answer, (i.e. 4 figures or 2 calculations)

e.g. There is a positive relationship – as the depth of water increases, the velocity also increases. Site C is the deepest point – the depth is 0.41 m and this has the fastest velocity (0.55 m/sec.). However, Site A is the shallowest point (0.21 m) and it has the slowest flow of 0.32 m/sec. [3]

- (iii) Explain the processes and land forms at X and at Y in this river meander.

Award [0] for a response not worthy of credit.

Level 1 ([1]–[2])

Candidates give a basic description of one of the processes or landforms. They might also identify the wrong processes at X or Y,
e.g. At X there will be some deposition. [1] This causes a slip off slope to form. [2]

Level 2 ([3]–[4])

The candidates identify the two processes working at X (Deposition) and Y (Erosion) but might not explain the process fully or might not elaborate on the landforms that have been created at each place,
e.g. At X the river is shallow so there will be some deposition in the river, whilst Y is deep with fast flowing water so there is erosion taking place.

Level 3 ([5]–[6])

The candidate identifies and fully explains the processes and the landforms that have been created at both X and Y. Good answers will use specialist terms relating to the processes of erosion and deposition and will have addressed both sides of the river meander – inner and outer banks,
e.g. At X deposition is occurring. The river has less energy as it goes around the inside of the bend. Sediment/silt is built up here because the water is slowing down and a slip off slope is formed. At Y, the water is deep and fast flowing which means that erosion will take place. Abrasion and hydraulic action will erode both the river bed and create a small river cliff. [6]

- (c) Describe **one** possible impact this flood had on people.

Answer should be clearly linked to the resource and the floods in Jedburgh. There should be a clear emphasis on people – with one clear argument based on reference to impact on drinking water, irrigation, silt, damage to property, risk of disease, injury or death, public health issues or insurance issues.

Award [1] for a simple statement that clearly addresses an impact of flooding on people,

e.g. The river left silt in homes/bridges were destroyed.

Award [2] for a statement with consequence

e.g. The river left silt which destroyed their belongings/bridges were destroyed causing people to be cut off from towns.

Award [3] for an answer that describes in some detail a possible impact that the flood could have had on people. There is a clear reference to the resource,

e.g. The river left silt which destroyed their belongings and furniture of local people and these were expensive to replace/bridges were destroyed causing people to be cut off and stopped people from being able to access local services or their place of work. [3]

- (d) For a named river outside the British Isles, evaluate the river management strategies used.

Award [0] for a response not worthy of credit.

There is no mark for the name of the river.

Max Level 1 if river within the British Isles or no named river.

Level 1 ([1]–[2])

Candidates provide a limited factual account of either one river management strategy. Candidates might not make reference to a named river outside the British Isles.

e.g. Levees were built along stretches of the Mississippi and these helped to stop the river from flooding.

Level 2 ([3]–[5])

Candidates provide a factual account of at least two strategies used on a named river outside the British Isles – there is limited evaluation of each of the strategies,

e.g. The US Corps of Engineers have tried to control the Mississippi by building or strengthening levees (hard engineering) and straightening meanders. The levee is built to a height of 15m above the usual water level but sometimes this is not high enough. [3]

Reference to only one method of river management in very good detail with facts and figures and evaluation max Level 2. [5]

Level 3 ([6]–[8])

Candidates provide detailed information (including two specific facts/figures/ places) **about river management strategies** used on a river outside the British Isles. There is a clear reference to more than one method. There is an evaluation of each method. Distinction within this level is based on the breadth of evaluation and a final evaluative comment/conclusion,

e.g. The Mississippi river in the USA has been managed for over 100 years to improve navigation and prevent flooding. One hard engineering method

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used was levees. These were raised to 15 metres along 3000 km of the river. These measures did help to reduce the amount of flooding of the river – there are fewer floods than previously. However, this strategy is very expensive as there needs to be a constant maintenance programme along the course of the river. Also, many residents complain that these measures spoil the look of the river and the building programme can cause environmental problems. A soft engineering method has been that the US Conservation Service spent \$25 million buying farmland which could be used as washlands. These are good as they do not require much maintenance; however the people who live in the area are worried that the government will allow flooding in their land in order to stop flooding in more sensitive places and cities. In conclusion a combination of both hard and soft engineering strategies are required to manage this river. [8]

Assessment of spelling, punctuation and the accurate use of grammar.

If the answer does not address the question then no SPaG marks are available. If the candidate has attempted to answer the question but produced nothing of credit, SPaG marks may still be awarded.

Threshold performance ([1])

Candidates spell, punctuate and use the rules of grammar with reasonable accuracy in the context of the demands of the question. Any errors do not hinder meaning in the response. Where required, they use a limited range of specialist terms appropriately.

Intermediate performance ([2]–[3])

Candidates spell, punctuate and use the rules of grammar with considerable accuracy and general control of meaning in the context of the demands of the question. Where required, they use a good range of specialist terms with facility.

High performance ([4])

Candidates spell, punctuate and use the rules of grammar with considerable accuracy and general control of meaning in the context of the demands of the question. Where required, they use a wide range of specialist terms adeptly and with precision. SPaG [4]

- (e) (i)** State **three** differences between a constructive and destructive wave.

Three separate statements that show the specific difference between the two waves are needed.

Award [0] for incomplete answers or answers that only make reference to one type of waves.

Award [1] for an answer which clearly states the differences between the two waves, e.g. by use of a comparative word such as stronger, higher, more, less, etc.

e.g. Destructive waves have a stronger backwash while constructive waves have a stronger swash when they reach the beach,

e.g. Destructive waves are also more frequent (15 per minute) than constructive waves (6 to 9 per minute), (figures not essential)

e.g. Destructive waves often occur in stormy/windy weather whilst constructive waves can occur in calm conditions,

e.g. Destructive waves will erode a beach whilst constructive waves will deposit material and build up the beach.

(3 × [1])

[3]

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- (ii) State the meaning of the term **longshore drift**.

Award [1] for a simple definition,
e.g. When eroded material is moved along the beach.

Award [2] for a full definition,
e.g. This is when eroded material in the sea is not carried straight up and down the beach but is carried across the beach in a saw tooth course (depending on the wind direction). [2]

- (f) Explain how an arch is formed.

Award [0] for a response not worthy of credit.

Level 1 ([1])

Candidates provide a limited explanation of how the arch is formed,
e.g. The arch is formed as the sea erodes through the soft rock easily.

Level 2 ([2]–[3])

The candidate describes the process of how the arch might be formed in the rock through the process of coastal erosion with some elaboration,
e.g. The arch is formed because the sea slowly erodes the rock and first a crack is formed in the rock and over time this is widened into an arch. [2]

To achieve [3] candidates must refer to idea of line of weakness, e.g. cracks or caves.

Level 3 ([4])

The candidate explains in some depth the different processes that were at work in order to form this feature. Reference should be made to how a feature like this is formed first from a crack and then the crack develops into a cave and then an arch can be formed in a headland. There should be a full discussion of the role that erosion by the sea plays in this process and mention should be made of one type of erosion like corrasion/abrasion; solution/corrasion and hydraulic action,
e.g. An arch is formed due to different processes of erosion at work along a line of weakness in the headland. The force of the water on stormy days will batter the rock (hydraulic action) and the water will also pick up stones and boulders and will blast these against the cliffs (abrasion). As a result cracks in the rock will form and these cracks will gradually widen into caves. The erosion process will continue over time and eventually the back wall of the cave will be eroded all the way through the headland for an arch to form. [4]

- (g) (i) Explain how gabions can protect the coastline.

Award [1] for an explanation of how gabions work, or simple description of gabions, e.g. Gabions are cages of rock/gabions protect the coastline.

Award [2] for a more detailed explanation of how gabions can work,
e.g. Gabions are metal cages that are filled with rocks. As the wave crashes, wave energy is reduced.

Award [3] for a full explanation that elaborates on how gabions can protect the coastline. Answers which make reference to keeping sand on the beach are also acceptable.
e.g. (Gabions are metal cages that are filled with rocks.) As the waves crash against the rocks, the energy of the water is forced between the spaces in the rocks and the energy is absorbed inside the cage, stopping the coastline from taking the full force of the erosion. [3]

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- (ii) Outline how beach nourishment helps to retain beaches.

Award [1] for a basic explanation of how beach nourishment can be used to retain cliffs and beaches,
e.g. Beach nourishment is when sand or pebbles are dumped onto a beach.

Award [2] for a full explanation that elaborates on how beach nourishment might be used,
e.g. Beach nourishment is when sand or pebbles are deposited onto a beach to replenish it. To make it wider/to replace sand which has been eroded/to absorb wave energy. [2]

- (h) Evaluate the sustainability of a named coastal management strategy in the British Isles which you have studied.

Award [0] for a response not worthy of credit.

Award Level 1 if no named coastline.

Reference to only one coastal management method in very good detail with facts and figures and evaluation max Level 2.

Level 1 ([1]–[2])

Candidates provide a limited factual account of the coastal management strategy. Candidates might not make reference to a specific case study from the British Isles. There is no evaluation and no reference to sustainability.
e.g. Coastal management strategies usually mean that councils will build sea walls to stop the sea from eroding the coast. Sometimes strategies will also involve the use of groynes and gabions as well.

Level 2 ([3]–[5])

Candidates provide a factual account of the coastal management strategy for a specific case study from the British Isles. The answer must evaluate the strategy to some level. The answer must refer to how sustainable the strategy is for 5 marks.

Answers at this level will have detail but might have:

- Reference to good depth about the strategy used for coastal management but no evaluation or sustainability [3]
- Reference to good depth about the strategy used for coastal management with a basic attempt to evaluate either the good or the bad aspects of the strategy [4]
- Answer with some limited evaluation but lacks factual detail [4]
- Good depth of information and an answer which is detailed but one-sided and deals with either the good aspects and how they are sustainable or the bad aspects [5]

e.g. In Newcastle, Co Down there have been a number of developments over the years which have been part of a sustainable strategy to manage the coast in Newcastle. The main features in recent years has been the building of a sea wall. In 2007 a new Newcastle promenade development was built which included a sea wall which was built 1 metre higher than the old wall. The programme cost £4 million and it was designed to stop the sea from flooding the town. [4]

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Level 3 ([6]–[8])

Candidates provide detailed information of the coastal management strategy for a specific case study from the British Isles. The answer has a balanced evaluation which clearly analyses the ways that this strategy has attempted to be sustainable. Distinction within this level is based on the breadth of evaluation in relation to sustainable development. A detailed answer will have a full evaluative statement/conclusion and 2 fact figures for Level 3. e.g. In Newcastle, Co Down there have been a number of developments over the years which have been part of a sustainable strategy to manage the coast in Newcastle. The main feature in recent years has been the building of a sea wall. In 2007 a new Newcastle promenade development was built which included a sea wall which was built 1 metre higher than the old wall. The programme cost £4 million and it was designed to stop the sea from flooding the town.

In one sense the sea wall is a long-term hard engineering solution. It is hoped that the wall will last for 50 years and will require minimal maintenance making it sustainable over many years. In addition further measures such as gabion boxes, rock armour and groynes will be used in sensitive areas to try and reduce the erosive power of waves but also help the beach to build up more deposited material. The promenade project was designed to fit in with the natural fabric of the beach zone and to fit into the character of the local area. However, some local people are concerned that all of the changes to the beach front might have had an impact on animal life along the shore. The programme has been a great success and whilst it cost a lot of money to build and maintain it is allowing Newcastle seafront to flourish again with the beach as the centrepiece. [8]

Assessment of spelling, punctuation and the accurate use of grammar.

If the answer does not address the question then no SPaG marks are available. If the candidate has attempted to answer the question but produced nothing of credit, SPaG marks may still be awarded.

Threshold performance ([1])

Candidates spell, punctuate and use the rules of grammar with reasonable accuracy in the context of the demands of the question. Any errors do not hinder meaning in the response. Where required, they use a limited range of specialist terms appropriately.

Intermediate performance ([2]–[3])

Candidates spell, punctuate and use the rules of grammar with considerable accuracy and general control of meaning in the context of the demands of the question. Where required, they use a good range of specialist terms with facility.

High performance ([4])

Candidates spell, punctuate and use the rules of grammar with considerable accuracy and general control of meaning in the context of the demands of the question. Where required, they use a wide range of specialist terms adeptly and with precision. SPaG [4]

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Theme B: Our Changing Weather and Climate

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- 2 (a) (i) State **three** reasons why this is the best location for thermometers.

Award [1] per correct reason such as:

- Air can still flow through
- Painted white to reflect any heat
- Thermometer is not influenced by direct sunlight (box provides shade)
- A more accurate result is obtained
- Consistency in recording for comparison purposes

(3 × [1])

[3]

- (ii) Describe why it is difficult for meteorologists to accurately forecast the weather.

Award [0] for a response not worthy of credit.

Answers can focus on either range or accuracy. Alternatively credit answers which relate to short term and long term forecasts.

Award [1] for an answer with a simple statement, e.g. The atmosphere is very unpredictable/the weather is changeable.

Award [2] for an answer with a statement and a consequence, e.g. The atmosphere is very unpredictable because of changing weather systems.

Award [3] for an answer with a statement, consequence and an elaboration, e.g. The weather is always changing because of different weather systems such as depressions change to anticyclones (or vice versa). [3]

Accept references to air masses, weather systems or fronts.

- (b) Study **Fig. 7** which illustrates a low pressure weather system over the British Isles. Answer the question which follows.

Describe and explain the likely changes in rainfall over Newcastle upon Tyne as the depression passes.

Level 1 ([1]–[2])

A simple statement outlining that rainfall will occur at the fronts, e.g.

- Rain will occur at the cold and warm front, however it will remain dry in the warm sector.

Level 2 ([3]–[4])

A descriptive or unbalanced answer with limited explanation provided, e.g.

- At the warm front nimbostratus clouds bring steady rainfall, however at the warm sector it becomes dry/drizzle. Finally as the cold front passes towering cumulonimbus clouds cause heavy rainfall to occur [3].

Level 3 ([5]–[6])

A detailed description and explanation of how the rainfall changes as the depression passes and should include reference to cloud types or air masses, e.g. As the warm front passes the lighter tropical maritime air will rise above the denser polar maritime air mass. This will cause the air mass to cool and condense forming nimbostratus clouds bringing steady rainfall to Newcastle upon Tyne. However in the warm sector there will be low cloud and perhaps drizzle as warm air can hold moisture as water vapour. Finally as the cold front passes, the polar maritime air mass undercuts the tropical maritime air mass forcing it to rise. This leads to the formation of cumulonimbus clouds and will bring heavy rainfall and possible thunderstorms to Newcastle upon Tyne. [6]

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- (c) (i) Describe the difference between the greenhouse effect and global warming.

Award [1] for an answer with a simple statement,
e.g. The greenhouse effect causes global warming,
e.g. global warming is an increase in the Earth's temperature.

Award [2] for an answer with a statement and a consequence on one of two terms,
e.g. The greenhouse effect causes heat to be trapped leading to the Earth's temperature increasing.

Award [3] for an answer which states the difference between and shows understanding of the two terms,
e.g. Global warming is the rise in the Earth's global temperatures. The greenhouse effect is one of the leading causes of global warming as greenhouse gases trap solar radiation. Human activity has led to an increase in greenhouse gases present within our atmosphere which has resulted in an increase in Earth's global temperature. [3]

- (ii) Explain how natural climatic cycles can lead to climate change.

Award [0] for references to volcanoes
Accept answers that refer to sunspot activity.

Award [1] for a simple statement that refers to only a change in temperature,
e.g. As the Earth's orbit changes a period of cooling usually follows a period of warmth,
e.g. the number of sunspots changes.

Award [2] for a statement with a consequence outlining the change in the Earth's orbit and temperature,
e.g. The Earth's orbit varies a little between circular and more elongated causing some periods to be warmer than others.

Award [3] for a detailed explanation with fact/figure,
e.g. The Earth's orbit varies a little between circular and more elongated every 100,000 years. Therefore warmer periods have been followed by a period of relative cooling. [3]

- (iii) With reference to a named country that you have studied, evaluate the likely effects of climate change on that country.

Award [0] for a response not worthy of credit.

Effects must be positive and negative.
Award max Level 1 if no named country.

Level 1 ([1]–[2])

Candidates provide a limited factual account of effects. Answers that don't refer to a named country are limited to this level.

- Higher temperatures [1] could lead to tree growth extending northwards [1]. Low lying areas could be flooded [1] due to rising sea levels, destroying businesses [1]. [2]

Candidates present some relevant information in a form and using a style of writing which suits its purpose. The text is reasonably legible. Spelling, punctuation and the rules of grammar are used with some accuracy so that meaning is reasonable clear. A limited range of specialist terms is used appropriately.

Level 2 ([3]–[5])

Candidates describe at least two effects; however one may be more detailed than the other. A valid case study must be used.

- Higher temperatures could lead to an increase in the growth of trees northwards. More insect pests could attack crops and therefore lower a farmer's profit. Low lying areas could be flooded due to rising sea levels. This will lead to losses in businesses and destroy wildlife habitats. [4]

Candidates present relevant information in a form and using a style of writing which suits its purpose. The text is legible. Spelling, punctuation and the rules of grammar are used with considerable accuracy so that meaning is clear. A good range of specialist terms is used appropriately.

Level 3 ([6]–[7])

A valid case study needs to be used. At least two facts/figures/places must be included to access Level 3 marks. An overall conclusion needs to be made at the end.

- A temperature increase of 2 °C could lead to the extinction of plant and animal species living in high mountainous areas such as mountain hares. However tree growth will extend northwards and increase in altitude.
Higher temperatures will lead to glaciers melting. Low lying areas such as the Fens, Somerset and London could be flooded. This will lead to losses in property and possessions. Millions of pounds will have to be paid out by insurance companies. Governments may have to raise taxes to help strengthen coastal defences. Overall, there are more negative impacts of climate change in this area [7]

Candidates present, and organise effectively, relevant information in a form and style of writing which suits its purpose. The text is fluent and legible. Spelling, punctuation and the rules of grammar are used with almost faultless accuracy so that meaning is clear. A wide range of specialist terms is used skilfully and with precision. [7]

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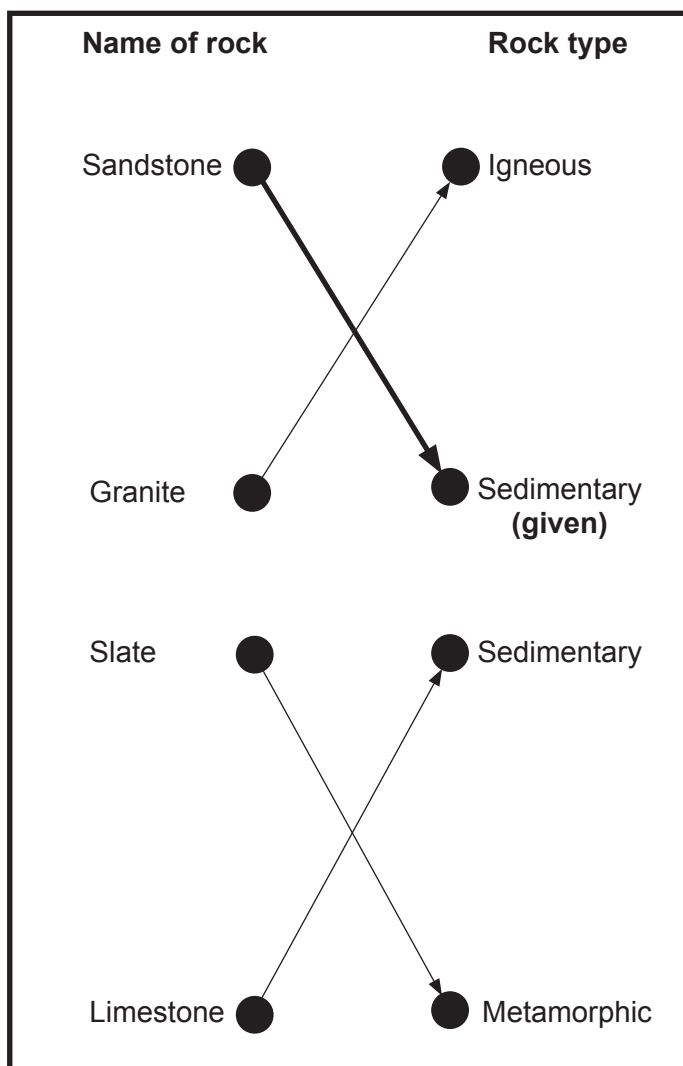
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Theme C: The Restless Earth

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- 3 (a) Study **Fig. 9** which shows some rock types. Answer the questions which follow.

- (i) Complete **Fig. 9** by linking the name of each rock to its rock type. One has been completed for you. [3]



- (ii) Explain how sedimentary rocks such as sandstone were formed.

Award [0] for a response not worthy of credit.

Award [1] for a simple accurate statement,
e.g. Sediments build up in layers,
e.g. sediments are carried by rivers to the sea.

Award [2] for a statement with a consequence which refers to deposition of layers of sediment on the seabed and sediments being squeezed,
e.g. Sediments which have been eroded are deposited on the seabed and are squeezed so they build up in layers.

Award [3] for a statement with a consequence and elaboration which refers to the deposition of layers of sediment building up on the seabed and being compressed and compacted under their weight over time to form layered rock (answer may also refer to fossil shells etc being trapped in the layers),

e.g. Sediments which have been eroded from the rocks on the land are carried into the sea by rivers and are deposited on the seabed; these sediments are compressed and compacted under their own weight so air and moisture are squeezed out and so over a long time will build up in layers forming solid rock. [3]

- (b) **Fig. 10** shows a volcanic plug in Myanmar, Asia. Answer the question which follows.

Explain how a volcanic plug is formed.

Award [0] for a response not worthy of credit.

Award [1] for a simple accurate statement which refers to magma cooling or to a volcano,
e.g. A plug forms inside a volcano **or** A plug is formed when magma cools and hardens.

Award [2] for an accurate statement which has a consequence,
e.g. A plug forms inside a volcano when magma cools as it rises towards the surface and hardens into (dolerite) rock.

Award [3] for a developed explanation with elaboration which shows understanding of the hardened magma being more resistant to erosion so that the plug stands out in the landscape,
e.g. A plug forms inside a volcano when magma cools as it rises towards the surface and hardens into dolerite rock; the sides of the volcano are eroded but the dolerite is more resistant and so stands out as the plug when the surrounding rock of the volcano is eroded. (not necessary to name dolerite rock) [3]

- (c) Study **Fig. 11** which shows the location of an earthquake in the Bristol Channel area on 20 February 2014. Answer the questions which follow.

- (i) This earthquake had a magnitude of 4.1. Name the scale which measures the magnitude of any earthquake.

Richter Scale [1]

- (ii) Name the settlement closest to the epicentre of this earthquake.

Swansea [1]

- (iii) This was one of the strongest earthquakes to hit the British Isles in the past 15 years. Explain why so few strong earthquakes are experienced in the British Isles.

Award [0] for a response not worthy of credit.

Award [1] for a simple accurate reason which refers to the location of the British Isles in relation to the cause of earthquakes,
e.g. The British Isles are far from a plate boundary.

Award [2] for a statement which develops the location in relation to earthquakes and could include a place name,
e.g. The British Isles are far from a plate boundary and are in the middle of a plate.

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e.g. The British Isles are far from the plate boundary and are in the middle of the Eurasian Plate.

Award [3] for a developed explanation which refers accurately to the location of the British Isles and shows understanding of intra-plate earthquakes and contains elaboration with named place,
e.g. The British Isles are far from a plate boundary at the Mid Atlantic Ridge; they are in the middle of the Eurasian Plate and it is movement at the plate boundary where stress builds up and it travels from the plate boundary to the middle of the plate. [3]

- (d) Describe **two** effects of a named earthquake in the British Isles which you have studied.

Award [0] for a response not worthy of credit.

Award [1] for each effect if no named earthquake or if earthquake is outside the British Isles.

Award [1] for a general effect of a named earthquake,
e.g. The Market Rasen earthquake in 2008 caused buildings to shake and fall.

or

e.g. A man was injured by falling debris in his bedroom.

Award [2] for a detailed effect which includes case study detail relating to the effect or damage,

e.g. The Market Rasen earthquake in 2008 caused buildings such as the stone cross on the medieval church to fall. [2]

e.g. A 19-year-old man broke his pelvis when the chimney collapsed onto his bedroom.

(2 × [2]) [4]

- (e) Study **Fig. 12** which shows a poster giving information on earthquake preparation in California, USA. Answer the questions which follow.

- (i) Outline **one** possible reason for the change in the number of deaths worldwide due to earthquakes.

Award [0] for a response not worthy of credit.

Award [1] for a general reason for the decrease in deaths,
e.g. The number of deaths has decreased because more precautions are now taken **or** because the severity or magnitude of earthquakes has reduced.

Award [2] for a reason which is elaborated on why deaths have decreased,

e.g. The number of deaths has decreased because more buildings have been made earthquake proof by installing interlocking frames (or foundations enable buildings to sway) etc. [2]

- (ii) “The people of California are well-prepared for the next big earthquake.”

Do you agree or disagree? Circle either **Yes** or **No**.

Explain your decision, using **two** pieces of evidence from **Fig.12**.

Award [0] for a response not worthy of credit.

Award [1] for a response which includes one relevant fact to justify choice of yes or no,

e.g. Only 22% of Californians feel they are ready for an earthquake.

e.g. Only one home in 5 has been built to earthquake-proof standards.

e.g. 70% of Californians are expecting a big earthquake.

Award [2] for a response that includes 2 accurate pieces of evidence,
e.g. 70% (7 out of 10) Californians expecting a big earthquake and

1 out of 5 homes is built to earthquake-proof standards. [2]

- (iii) For an earthquake in a MEDC which you have studied, evaluate the success of **one** precaution used before the earthquake happened.

Name of earthquake and/or date, e.g. Kobe, Japan 1995.

Award [0] for a response not worthy of credit.

Award [1] for good answer but no named earthquake or uses LEDC earthquake.

Award [1] for a simple statement outlining one precaution,

e.g. Water was stored so it was available in case of an earthquake.

e.g. Some buildings were made earthquake-proof so they wouldn't collapse.

e.g. There was an education programme set up so people would know what to do.

Award [2] for some description of one precaution and its success or otherwise,

e.g. The public in Japan were educated in how to survive an earthquake so they knew where to go to escape from buildings into open spaces and parks.

e.g. Water was stored in underground cisterns so people had water in case water pipes were shaken and broke.

e.g. There were buildings constructed to withstand earthquakes by having cross-beams, springs and rubber pads to absorb the shaking.

Award [3] for a good description of one precaution with clear evaluation of its success/limitations; the answer must demonstrate specific case study knowledge to measure the success of the precaution with **one specific fact/figure/place** related to the named earthquake for Level 3.

e.g. Water was stored in underground cisterns so people had water if water pipes were shaken and snapped, but not enough water was available; this meant when fires broke out in the many wooden houses in the **Nagata district** of Kobe, many people were injured or killed.

e.g. There was a public education programme in Japan so that people had practised evacuation and they knew to move calmly outside; however there were not enough open spaces such as parks in the **Nagata district** of Kobe for people to assemble safely in 1995; the **green belts along the river valleys** had been planned but not created so many people died as buildings collapsed onto the streets.

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e.g. In Kobe many of the more modern buildings constructed after 1980 could withstand an earthquake by having cross-beams, springs and rubber pads to absorb the shaking; this means they did not collapse and kill people, e.g. **Kansai International Airport** or the **Akashi Bridge** remained intact; however despite this precaution, many older buildings collapsed.

[3]

Total**AVAILABLE
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25

108