Rewarding Learning

General Certificate of Secondary Education
2018

Geography

Unit 1:
Understanding Our Natural World

Higher Tier

[GGG12]

TUESDAY 22 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) State the height of the land shown by the spot height at the top of Rusey Cliff, GR 128935.

247 m [1]

(ii) State the straight line distance from the campsite near Ringford Farm GR 126926 to the bridge on the River Ottery at Trengune GR 189933.

Award [2] for 6.2–6.4 km
Award [1] for 6.1–6.19 or 6.41–6.5 [1] [2]

(iii) State the direction of Pencannow Point GR 1397 from Boscastle GR 0990.

North East [1]

(iv) Complete **Table 1** by naming a river feature found at the locations given.

Table 1

Grid Reference	River Feature
GR 2092	Meander [1] or floodplain [1]
GR 0888	Waterfall [1]

(2 × [1]) [2]

(v) Coasts are shaped by waves. State **three** facts about destructive waves.

Accept any valid characteristic as listed below:
- They have a strong backwash compared to their swash.
- They are high (in relation to their length).
- They are frequent waves (break at a rate close to 15 per minute).
- More common in winter.
- Have strong erosive power.

(3 × [1]) [3]

(b) **Fig. 1** is a photograph of a wave cut platform at Pencannow Point, GR 1397.

Explain how a wave cut platform such as this is formed.

Award [0] for an answer not worthy of credit.

Level 1 ([1]–[2])
A simple correct statement about wave cut platform formation or description of the feature,
e.g. They are formed by erosion [1], they are flat areas in front of cliffs formed by erosion. [2]

Level 2 ([3]–[4])
A partial explanation relating to wave cut platform formation,
e.g. They are formed by erosion when a cliff is undercut and collapses. [3]
e.g. They are formed by erosion such as abrasion when a cliff is undercut and collapses leaving a flat area of rock at the base of the cliff. [4]

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Level 3 ([5]–[6])
A full explanation of how a wave-cut platform is formed, referring to the repetitive process of erosion creating the flat area of the platform,
e.g. It is caused by erosion when a notch created by erosion such as abrasion and hydraulic action is further eroded undercutting the cliffs. The upper cliff is repeatedly undercut and eventually collapses to create a wave-cut platform, a flat area of rock at the base of the cliff. [6]

(c) Study **Fig. 2**, a photograph of Northern Door, an arch located near Cambeak GR 128967.

(i) Explain how an arch such as this is formed.
Award [0] for an answer not worthy of credit.

Level 1 ([1])
A limited explanation of how the arch formed,
e.g. The arch is formed as the sea erodes through the soft rock easily.

Level 2 ([2]–[3])
A description of how the arch formed 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.
To achieve [3] the candidate must include reference to cracks or caves.

Level 3 ([4])
An answer which names two processes that operate to form the arch. Reference should be made to how the feature is formed, first from a crack which then develops into a cave and then an arch can be formed in a headland when the cave is eroded fully through. The types of erosion involved should be named i.e. corrasion/abrasion and solution/corrosion, hydraulic action.
e.g. An arch is formed due to different processes of erosion at work along a line of weakness in a headland. The force of the water on stormy days will batter the rock (hydraulic action) and the water will also use pebbles and boulders to erode the cliff (abrasion). As a result a notch will be eroded at the foot of the cliff to form a crack. This gradually widens to create a cave. The erosion process continues over time until eventually the back wall of the cave will be eroded all the way through the headland for an arch to form. [4]

(ii) Explain what may happen to this arch in the future.

Award [1] for a simple statement identifying the creation of a stack,
e.g. The roof will collapse. [1]
e.g. A stack is left after erosion [1]

Award [2] for an answer which refers to the process of roof/arch collapse,
e.g. Over time the processes of erosion will continue to attack the roof of the arch until it collapses.

Award [3] for an answer which refers to erosion leading to the formation of a stack (and ultimately a stump).
e.g. Over time the processes of erosion will continue to attack the roof of the arch until it collapses (under the force of gravity). This leaves an isolated pillar of rock protruding from the sea called a stack. [3]

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(d) Coasts often need protection against erosion.

(i) State **two** reasons why a stretch of coastline may need to be protected against erosion by the sea.

Award [1] for one valid aspect needing protection,
e.g. The coastline may have valuable buildings such as an oil terminal which needs to be protected,
e.g. There may be hotels along the coast or a sandy beach which needs to be maintained to attract tourists.
(2 × [1]) [2]

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

Award [0] for an answer not worthy of credit.

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

Level 1 ([1]–[2])
A limited factual account of a coastal management strategy. The answer may not make reference to a specific case study from the British Isles. No evaluation and no reference to sustainability,
e.g. The council built a sea wall to stop the sea eroding the coastline. Groynes and gabions are used as well.

Level 2 ([3]–[5])
A factual account of a coastal management strategy for a specific case study from the British Isles. The answer must evaluate the strategy so there must be analysis of both positive and negative aspects of the strategy. The emphasis of the answer must be on how sustainable the strategy is. Possible answers may have:

- Good detail on the strategy used for coastal management but no evaluation or sustainability [3]
- Limited information on one strategy with some evaluation [3]
- Reference in good depth about the strategy used with a basic attempt to evaluate either the good or bad aspects of the strategy [4]
- Answer with some limited evaluation but lacking in factual detail [4]
- Good depth of information in a detailed answer but one which is one-sided and deals with the positive aspects and how they are sustainable or the negative 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 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 sea wall. The programme cost £4 million and it was designed to stop the sea from flooding the town.

Level 3 ([6]–[8])
An answer which includes detailed information on 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. Differentiation in this level is based on the breadth of evaluation in relation to sustainable development. The detailed answer will have a full evaluative comment

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and conclusion. A minimum of two methods should be included. Credit also other relevant strategies.
e.g. In 2007 a new Newcastle promenade development included a sea wall which was built 1 metre higher than the old sea wall. It cost £4 million and it was designed to stop the sea from flooding the town. The sea wall is a long-term hard engineering solution. It is hoped that it will last 50 years and will require minimal maintenance making it sustainable over many years. In addition, gabions were used in sensitive areas, e.g. the mouth of the River Shimna to reduce the impact of the erosive power of the waves. The sea wall was expensive and the gabions may rust and spill and need to be replaced and are not sustainable. However, some local people are concerned that the changes to the beach front have had an impact on animal life along the shore. However, overall the programme has been successful although it cost a lot of money. [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 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 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. [4]

(e) Study **Fig. 3** which presents data collected by geography students on a field trip at three different sites on a river.

(i) Describe and explain the changes in the channel shape between Site 1 and Site 3.

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

Level 1 ([1]–[2])
An answer which deals with one aspect only, either description or explanation (may include 0 or 1 figures),
e.g. The river channel gets deeper. [1]
e.g. The change in channel shape is due to erosion [1] in particular hydraulic action and abrasion. [2]
e.g. The river channel gets wider and deeper [2]

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Level 2 ([3]–[5])
A detailed description of either width or depth or both width and depth with two figures or one calculated figure [3], an answer which addresses both aspects (both description and explanation) of the question but without figures [4] or an answer which attempts to identify the trend with figures using two sites and up to 3 figures and offers a basic explanation [5], width and depth described with some figures and some explanation e.g. At Site 1 the river channel is narrow and V shaped. Here the river is just 160 cm wide and 22cm deep. At Site 3 the river channel is the widest at 1400cm. [3] This variation is due to increased erosion as the river erodes downwards and sideways into the banks. [5]

Level 3 ([6]–[7])
An answer which refers to the variation between sites 1–3 and describes the increase in depth and width with at least two pairs of figures. Credit a calculated figure as equal to a pair of figures. The response should also offer an explanation for this trend referring to the type of erosion using geographical terminology – abrasion and hydraulic action/vertical and lateral erosion. Reference needs to be made to width, depth, location and types of erosion, lateral/vertical or named types of erosion [7],
e.g. At Site 1 the river channel is narrow and V-shaped. Here the river is just 160 cm wide and 22 cm deep. This contrasts to Site 2 where the river has widened to 920 cm and is approximately 40 cm deep. At this point the channel has a steep side and a more gentle channel slope on the other side. At Site 3 the river has a more rounded cross section and at it's widest is 1400 cm, and over 50 cm deep. This variation in width and depth is partly due to the location of the three sites. Site 1 is close to the source and this explains the narrow V-shaped channel where vertical erosion is dominant while Site 3 is close to the mouth and is therefore wider and deeper due to increased lateral erosion. In particular the river erodes its banks more downstream due to the force of water (hydraulic action) and abrasion leading to a wide channel. The grinding of rock fragments against the bed also deepens the river channel. [7]

(ii) How is discharge calculated?

Award [0] for a definition of discharge

Award [1] for a simple statement,
e.g. Calculated using the channel area and river velocity. [1]

Award [2] for formula.There is no requirement to state the units being cumecs,
e.g. Cross-sectional area of channel × The velocity of the water. [2]

(iii) Suggest **two** reasons why discharge may vary along a river channel.

Award [1] per possible valid reason, e.g. more tributaries downstream/ increased area drained downstream/changes in vegetation/variation in drainage basin relief/man's activities/changes in rock type/weather conditions/afforestation
(2 × [1]) [2]

(f) With reference to a river in the British Isles, explain the physical and human causes of a flood on your named river.

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Award [0] for a response not worthy of credit.
No mark for name of river in the British Isles. e.g. Derwent
Max Level 1 if river outside British Isles or if no named river.
Max [4] if only physical or human factors used.

Level 1 ([1]–[2])
Causes of a river flooding are stated or described, but without explanation, e.g. It flooded in England due to heavy rain, building and peat extraction.

Level 2 ([3]–[5])
The causes of flooding are described and some explanation is included, but no specific facts or figures are included relating to a river in the British Isles, e.g. In March in England there was flooding. There were several physical causes such as the heavy rainfall at the time of the flood, also there was a lack of infiltration as this rainfall fell onto ground that was almost saturated from previous rainfall events. Human factors also played a part. Areas of the floodplain were being urbanised and this reduced infiltration and increased surface run-off. Max [4] if only physical **or** human factors used.

Level 3 ([6]–[7])
The causes of flooding are described in detail with full explanations including two facts or figures relating to a river within the British Isles [7], if there is only one specific fact/figure maximum [6],
e.g. In March 1999 people near the River Derwent experienced severe flooding. There were several physical causes such as the heavy rainfall, at the time of the flood over 250 mm of rain fell on the North York Moors; also there was a lack of infiltration as this rainfall fell onto ground that was almost saturated from previous rainfall events. Human factors also played a part. Areas of the flood plain were being urbanised, such as the new estate built at Malton; this reduced infiltration and increased surface run-off. [7]

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 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 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. [4]

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2 (a) (i) Name the sources of data illustrated in **Fig. 4**.

A Weather Balloon
B Geostationary/Polar Satellite (also accept satellite)
C Weather Buoy
Award [1] for each correct answer. [3]

(ii) Distinguish between weather and climate.

Award [1]
A simple answer which defines either weather or climate,
e.g. Weather is the day to day changes in the atmosphere [1]

Award [2]
An accurate statement which briefly defines both weather and climate,
e.g. Weather is the day to day changes in the atmosphere whereas climate is the average weather conditions. [2]

Award [3]
A detailed answer which defines both weather and climate,
e.g. Weather is the day to day changes in the conditions of the atmosphere. Climate is the average weather conditions taken over a longer period of time, e.g. 30–35 years. [3]

(b) Describe and explain the temperature and moisture characteristics of a Polar Maritime air mass.

Level 1 ([1])
A simple statement,
e.g. It is cold or it is wet [1]

Level 2 ([2]–[3])
The answer describes both characteristics but does not explain why or alternatively explains one characteristic fully, e.g.
- It is cold and wet [2]
- It is cold as the air is coming from a northerly direction [2]
- It is cold as the air is coming from a northerly direction and it also brings moisture [3]

Level 3 ([4])
A statement that describes and explains both temperature and moisture,
e.g. It is cold as the air is coming from a northerly direction and it also brings moisture as the air mass travels over the Atlantic Ocean enabling the air mass to pick up moisture. [4]

(c) Using **Fig. 5** describe and explain two elements of the weather experienced at weather station A (Newcastle upon Tyne).

Level 1 ([1]–[2])
A simple description only. To achieve top Level 1 the candidate must include at least one valid figure for Newcastle upon Tyne, e.g.
- Temperatures are high [1] or there is an absence of clouds [1].
- Temperatures are high and cloud cover is low [1] (as no valid figures are provided).
- Temperatures are high at 25°C [2]
- Cloud cover is low at 1/8 oktas. [2]

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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 the meaning is reasonably clear. A limited range of specialist terms is used appropriately.

Level 2 ([3]–[4])
A brief description and some explanation of weather experienced in Newcastle upon Tyne. If the candidates only address one weather element they should be limited to bottom of Level 2,
e.g. In Newcastle upon Tyne the temperature is 25° C. Temperatures are high as the days are longer therefore allowing more time for solar radiation to heat the ground, which in turn heats the air, [3]
e.g. In Newcastle upon Tyne the temperature is 25° C. Temperatures are high as the days are longer. There is an absence of clouds as cloud cover is only 1/8 oktas, [3]
e.g. In Newcastle upon Tyne the temperature is 25° C. Temperatures are high as the days are longer. There is an absence of clouds (1/8 oktas) as air is sinking. [4]

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

Level 3 ([5]–[6])
A detailed description and explanation of two elements of the weather experienced in Newcastle upon Tyne. Two weather elements must be quoted from the weather station located over Newcastle upon Tyne,
e.g. The British Isles is experiencing a Summer anticyclone. In Newcastle upon Tyne the temperature is 25° C. Temperatures are high as the days are longer therefore allowing more time for solar radiation to heat the ground, which in turn, heats the air. Cloud cover is only 1/8 oktas therefore there is an absence of clouds. This occurs as air sinks in an anticyclone causing air to warm up. [5] This restricts the process of condensation and ultimately cloud formation. [6]

Candidates present and organise effectively relevant information in a form and using a 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 the meaning is clear. A wide range of specialist terms is used skillfully and with precision.

(d) State the meaning of the term **global warming**.

Level 1 ([1])
The temperature of the atmosphere is increasing. [1]

Level 2 ([2])
Should include the temperatures rising and man's role in it for [2],
e.g. The temperature of the atmosphere is increasing. This is due to man's activity (such as burning fossil fuels which releases CO_2 into the atmosphere),
e.g. The production of greenhouse gases leading to an increase in temperature.

[2]

(e) Explain **one** way in which a volcano eruption may change the climate.

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

Award [1]
A brief statement only,
e.g. The volcano ejects SO_2 or ash or water vapour, etc.

Award [2]
Some explanation is provided,
e.g. The SO_2 or ash ejected by the volcano blocks out the sunlight or reflects solar radiation.

Award [3]
A fully elaborated explanation is provided,
e.g. The ash ejected into the atmosphere by the volcano blocks out the sunlight or the SO_2 forms sulfuric acid in the atmosphere which reflects solar radiation and this lowers the temperature and so cools the climate. [3]

(f) Outline **two** difficulties associated with securing international co-operation to deal with climate change.

Challenges may include dependence on fossil fuels, development of economy, public resistance to greener technology, financial cost to governments of implementing these agreements.

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

Candidate must refer to two challenges. If only one challenge is discussed then award maximum [2]. Each challenge must have some elaboration.

- Countries are heavily dependent on fossil fuels [1]. It is expensive to implement new green technologies to create the same amount of power to sustain the current energy demand. Therefore it's hard to fulfil these agreements. [1]
- Many governments have good intentions when it comes to reducing carbon emissions. [1] However some MEDCs such as the USA refuse to sign these treaties as they think it will harm their economy by raising unemployment levels. [1]
- Many individuals recognise that climate change is a problem. [1] However, not everyone will exercise responsibility when it comes to energy efficiency or waste reduction. People need to make these personal choices if these agreements are to work. [1]

(2 × [2]) [4]

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Theme C: The Restless Earth

AVAILABLE MARKS

3 **(a)** Study **Fig. 7** which shows the structure of the Earth.

(i) Complete **Fig. 7** by identifying the layers of the Earth labelled **X** and **Y**

X = Mantle Y = Core [2]

(ii) The crust of the Earth is divided into plates. Explain how plates move.

Award [1] for a brief accurate statement,
e.g. Plates can move because they float on the mantle or because of currents of magma below the plates.

Award [2] for a statement with a consequence,
e.g. Plates can move because they rest on the molten magma of the mantle which moves in convection currents.

Award [3] for a statement, consequence and elaboration which makes a link to the rising or falling currents,
e.g. Plates can move because they rest on the molten magma of the mantle which moves in convection currents so that where magma rises the plates were pulled apart (or where the magma sinks in a convection current the plates are dragged down and destroyed). [3]

(b) Study **Fig. 8** which shows the location of igneous rocks in Northern Ireland.

(i) Describe the distribution of granite as shown in **Fig. 8**.
Note: Some candidates may refer to scale, place name, e.g. Mournes or where granite is not found.

Award [1] for a simple statement relating to distribution.
Accept Co. Down if mentioned,
e.g. It is situated in the south east of Northern Ireland (also accept in the south of Northern Ireland), [1]
e.g. There is not a lot of granite in Northern Ireland. [1]

Award [2] for a detailed statement,
e.g. There is a small area [1] of granite in the south east of Northern Ireland. [1]
e.g. Granite is **only** found in the South East [2] [2]

(ii) Explain how granite is formed.

If basalt or another igneous rock type chosen, then award [1] maximum.

Award [1] if answer gives a basic statement on how any igneous rock might be made,
e.g. It's made from molten rock that hardens. [1]
e.g. Made from magma [1]

Award [2] if answers are an incomplete explanation of granite formation,
e.g. Granite is made from molten rock which hardens under the ground.
e.g. Granite is made from magma [1] that cools (slowly) underground [2]

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Award [3] if answer gives a full explanation of how granite is made, e.g. Granite is made from molten rock which hardens under the ground, so it cools slowly allowing large crystals of minerals (like quartz to fuse together). [3]

(c) Study **Fig. 9** which shows information about an earthquake in Ecuador in April 2016.

(i) State the name of the city furthest away from the epicentre.

Guayaquil [1]

(ii) Define the term **epicentre**.

Award [1] for a brief statement,
e.g. The point directly above the focus.
e.g. The point where strongest shaking takes place.
e.g. The point on the surface above which the earthquake happened [1]

Award [2] for a more detailed statement,
e.g. The point on the Earth directly above the focus. It is where the strongest shaking is first felt in an earthquake. [2]

(iii) Ecuador lies on a destructive plate boundary.

Explain why earthquakes occur at a destructive boundary.

Award [1] A simple statement regarding destructive boundaries,
e.g. Plates are moving towards each other.

Award [2] A partial explanation of a destructive boundary,
e.g. Plates are moving towards each other and one plate is forced under the other. This causes pressure to build up.

Award [3] A detailed explanation of destructive boundaries,
e.g. Plates are moving towards each other and one plate is forced under the other. Usually oceanic crust is subducted under the continental crust. This causes pressure to build up. Eventually the pressure will get released in the form of shock waves. These waves cause the ground to shake violently. [3]

AVAILABLE MARKS

(d) Tectonic activity has occurred within the British Isles.

(i) Complete **Table 2** below by naming a location within the British Isles where these features can be found.

Table 2

Volcanic feature	**Location within the British Isles**
Lava Plateau	**e.g. ANTRIM**
Basaltic columns	**e.g. GIANT'S CAUSEWAY** (Staffa)
Volcanic plug	**e.g. SLEMISH** (Edinburgh)

Accept any valid alternative.
(3 × [1]) [3]

(e) Name an earthquake in a MEDC which you have studied. Outline the cause of this earthquake and evaluate the success of **one** precaution used before the earthquake happened.

Accept any valid MEDC earthquake, e.g. Japan 2011.
Max Level 1 if no named earthquake or LEDC earthquake.

Level 1 ([1]–[2])
Answer here will briefly discuss the cause and/or the precaution used.
e.g. Japan is on a destructive boundary [1]. They hold an earthquake drill each year [1]

Level 2 ([3]–[4])
Answers in this level will discuss the cause and precaution used.
1 fact/figure needed for Top Level 2. [4]

e.g. Japan sits on a destructive plate boundary. A large amount of pressure built up between the plates and was released. The Japanese invest a large amount of money in trying to plan for earthquakes [3]. They spend over £70 million on seismometers, tiltmeters and satellite images to help predict where it will occur. [4]

Level 3 ([5]–[6])
Answers in this level will give a detailed account of the cause and the precaution used. 2 fact/figures needed for [5]. An evaluative comment needed on the success of the precaution for [6].

e.g. Japan sits on a destructive plate boundary between 3 plates (Pacific, Eurasian and Philippine plate) A large amount of pressure built up between the plates and was released in a 9.0 earthquake. This triggered a large tsunami. The Japanese invest a large amount of money in trying to predict earthquakes. They spend over £70 million on seismometers, tiltmeters and satellite images to help predict where it will occur. [5] However, despite all this invested over 20,000 people died and 5,000 people were injured. This precaution was not a success. [6]

25

Total **108**