



General Certificate of Secondary Education
2012

Geography

Unit 1:
Understanding Our Natural World

Higher Tier

[GGG12]

THURSDAY 14 JUNE, MORNING

MARK SCHEME

Theme A: The Dynamic Landscape

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MARKS

- 1 (a) (i)** State the height of the land at its highest point in grid square 0177.
- 125 metres [1]
No alternative answer accepted.
- (ii)** State the straight line distance from the Visitor Centre at Swanage (GR 036787) to the hotel at the end of the spit (GR 038871).
- Answer is 8.3 km
- Level 1 ([1])**
8.0–8.19 km or 8.41–8.6 km
- Level 2 ([2])**
8.2–8.4 km [2]
- (iii)** State the direction of Old Harry (GR 0582) from the World Heritage Site at Swanage (GR 0378).
- North east [1]
No alternative answer accepted.
- (iv)** The southern coastline from GR 9876 to GR 0376 is lined with cliffs. Explain how hydraulic pressure erodes cliffs such as these.
- Award [0] for a response not worthy of credit.
- Level 1 ([1])**
A basic statement
e.g. The waves attack the cliffs.
- Level 2 ([2])**
A statement and consequence
e.g. The waves attack the cliffs. They become unstable and eventually collapse.
- Level 3 ([3])**
A statement and consequence with elaboration on air in cracks
e.g. The waves attack the cliffs. The waves force air into the cracks in the cliffs. This causes the pressure to increase and over time they become unstable and collapse. [3]
- (v)** Name the method of coastal protection found in GR 0379 and describe how it works.
- Method – Groynes [1]
- Award [0] for a response not worthy of credit.
- Level 1 ([1])**
A basic description
e.g. They trap material on a beach.

Level 2 ([2])

A statement with consequence

These are wooden structures on a beach which stop longshore drift by trapping sand.

Accept valid alternative answers such as:

They help maintain the beach so the beach can absorb the wave energy and therefore minimise erosion. [2]

If alternative coastal protection named award [1] for good description.

- (b) **Fig. 1** is part of a tourist brochure for Brownsea Island (GR 0188).

Using map evidence state **three** activities suitable for holidaymakers on Brownsea Island.

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

Any three appropriate tourist activities on Brownsea such as:

Viewpoint, Walks, Branksea Castle, Nature Reserve, National Trust, The Villa, Church etc.

(3 × [1])

[3]

- (c) Study **Fig. 2** a photograph of Old Harry (GR 0582). Old Harry is an example of a stack. Explain how a stack forms.

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

Level 1 ([1]–[2])

Simple explanation of a stack.

e.g. It is caused by erosion. [1]

e.g. It is a piece of land surrounded by water caused by erosion from the waves. [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 reasonably clear. A limited range of specialist terms is used appropriately.

Level 2 ([3]–[4])

A more detailed explanation of the processes involved in the formation of a stack **or** An overview/outline of some stages in its information.

e.g. A stack is formed when the roof of an arch collapses, leaving only a piece of land standing. Waves attack the cliff creating weaknesses which will eventually erode it away. [3]

e.g. A stack is formed when the roof of an arch collapses leaving only a piece of land standing. Waves attack the cliff by throwing material against it; this is abrasion and over time it creates weaknesses which will eventually erode it away. [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.

AVAILABLE
MARKS

Level 3 ([5])

A full explanation of the processes that help form a stack **or** Full details of the stages/sequence in the development of a stack

e.g. A stack is a piece of land that has been separated from the land due to weathering and erosion. Waves attack the caves/notches in the cliff by throwing material against them; this is abrasion and over time it creates weaknesses which will eventually cut through the cliff. This also places a strain on the cliff. The arch grows in size and the roof of the arch will collapse as it no longer can support its own weight.

Accept valid alternative answers relating to other erosion processes such as hydraulic pressure.

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. [5]

- (d) (i) Study **Fig. 3** which shows how people use the coast. Answer the questions which follow.

State **one** human activity shown at the coast in **Fig. 3**.

Accept tourism, holidays, swimming, sunbathing, or other recreational activity on a beach. [1]

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

- (ii) State **one** other use made of the coast by people.

Accept valid activities such as trade, ports, agriculture, energy production, residential etc.

Can also accept playing on the beach, swimming in the sea etc. but not if given as answer to part (d)(i). [1]

- (iii) Describe the conflicting nature of **one** human activity in a coastal area. Refer to a place in your answer.

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

Level 1 ([1])

A basic statement (maybe only one side of the argument)

e.g. Tourists want lots of activities to go and enjoy.

Level 2 ([2])

A statement that shows how the activity can cause conflict.

e.g. Tourists want lots of activities to enjoy in an area whereas environmentalists want to preserve the coastline.

AVAILABLE
MARKS

Level 3 ([3])

A detailed answer showing how the activity causes conflict and refers to a place.

e.g. Tourists want lots of activities and places to stay and enjoy whereas environmentalists don't want the land to be eaten up by developers. This ruins habitats for plants and animals, e.g. Costa del Sol in Spain. [3]
Accept valid alternative human activities which are in conflict such as residential, transport and industry.

- (e) Study **Fig. 4** below which shows a cross-section of a river feature. Answer the questions that follow.

- (i) Name the feature shown in **Fig. 4**.

Meander

[1]

No alternative answer accepted.

- (ii) Explain how this feature was formed.

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

Level 1 ([1]–[2])

A basic statement.

e.g. A meander is a bend in the river [1]

e.g. A meander is a bend in the river formed by erosion. [2]

Level 2 ([3]–[4])

A more detailed explanation that highlights both processes. One may be completed in more detail. Both needed to achieve top Level 2.

e.g. Water flows fastest on the outer bend of the river where the channel is deeper and there is less friction. This is due to water being directed towards the outer bend as it flows around the meander, this causes greater erosion which deepens the channel. [3]

e.g. Water flows fastest on the outer bend of the river where the channel is deeper and there is less friction. This is due to water being directed towards the outer bend as it flows around the meander, this causes greater erosion which deepens the channel; in turn the reduction in friction and increase in energy results in greater erosion. In contrast, on the inner bend water is slow-flowing, deposition occurs. Over time a small beach of material builds up on the inner bend. [4]

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MARKS

Level 3 ([5])

A full explanation of how a meander forms, making reference to both erosion and deposition. A Level 3 answer will include the features such as a river cliff point bar/slip off slope.

e.g. Water flows fastest on the outer bend of the river where the channel is deeper and there is less friction. This is due to water being directed towards the outer bend as it flows around the meander, this causes greater erosion which deepens the channel; in turn the reduction in friction and increase in energy results in greater erosion. This erosion results in the formation of a steep-sided river cliff.

In contrast, on the inner bend water is slow-flowing, deposition occurs. Over time material builds up on the inner bend; this is called a slip-off slope.

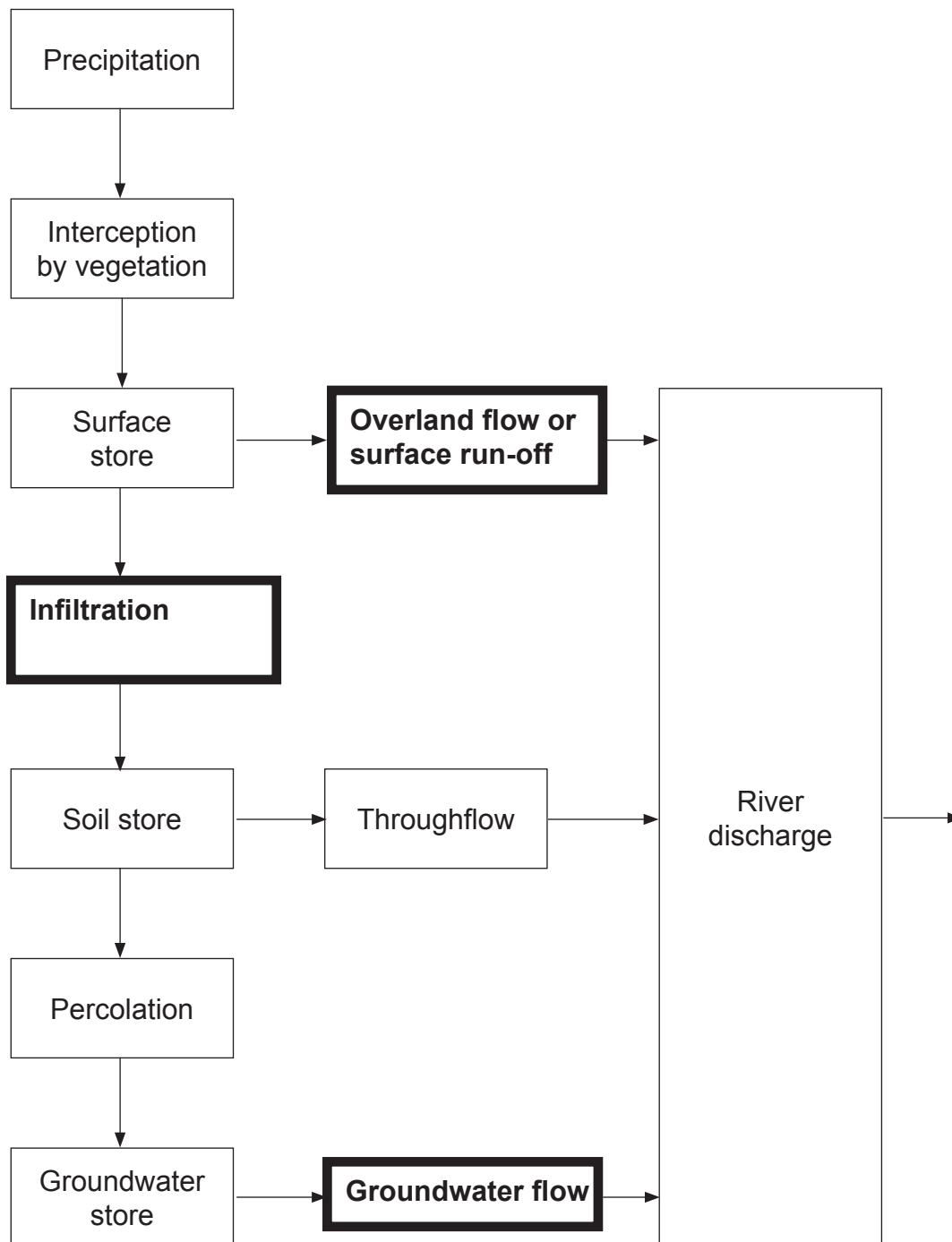
[5]

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MARKS

(f) Study **Fig. 5** which shows part of the water cycle. Answer the questions which follow.

(i) Complete **Fig. 5** by filling in the blank spaces.

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MARKS



(3 × [1])

[3]

(ii) Name **one** input and **one** output shown on **Fig. 5**.
Accept no alternative answer.

Input = Precipitation

Output = River discharge

(2 × [1])

[2]

- (iii) Explain **one** effect on the drainage basin cycle if the vegetation is removed.

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

Level 1 ([1])

A basic statement.

e.g. More rain will reach the ground.

e.g. There will be flooding.

Level 2 ([2])

e.g. A statement and consequence.

e.g. More rain will reach the ground and this will cause flooding.

Level 3 ([3])

A statement, consequence and elaboration of the process.

e.g. More rain will reach the ground which means the soil will become saturated. When the ground is saturated with water there will be more surface run-off and flooding as a consequence. [3]

Accept valid alternative answers such as less interception.

- (g) Study **Fig. 6** which shows a drainage basin which experienced flooding in Co. Tyrone. Answer the questions which follow.

- (i) Label the drainage basin feature **A** shown in **Fig. 6**.

Watershed

[1]

No alternative answer accepted.

- (ii) State fully **one** human cause of flooding.

Accept valid alternative answers such as building of an urban area, river engineering or possible deforestation in the surrounding land.

Award [0] for a response not worthy of credit such as physical causes of flooding.

Level 1 ([1])

A basic statement.

e.g. The building of a town can cause flooding.

Level 2 ([2])

A statement and consequence.

e.g. The building of the town can cause flooding because of the impermeable surfaces such as tarmac and concrete which don't allow water through.

Level 3 ([3])

A statement, consequence and elaboration.

e.g. The building of the town caused flooding because of the impermeable surfaces such as tarmac and concrete. This prevented infiltration into the ground. As a result the water flooded the land. [3]

AVAILABLE
MARKS

- (h) (i) State the meaning of the term **soft engineering**.

Award [0] for a response not worthy of credit such as hard engineering definition.

Level 1 ([1])

A basic definition.

e.g. When environmentally friendly methods are used to prevent erosion.

Level 2 ([2])

A fuller definition.

e.g. This involves using a strategy to control a natural hazard which blends into the environment and is sustainable in the long term. [2]
Accept valid alternative answers.

- (ii) Evaluate **two** river management strategies used on a river that you have studied outside the British Isles.

Most will choose Mississippi.

If they choose river in the British Isles (maximum Level 1) or no named area. No named river maximum Level 2.

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

Level 1 ([1]–[3])

Candidates provide a limited factual account of strategies used on a named river or many provide a factual account with no reference to a named river outside the British Isles.

e.g. levees were used [1] to control flooding [2] and dams were built [3].

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 ([4]–[5])

Candidates provide a factual account of strategies used on the named river with some evaluation. One strategy may be evaluated more than the other.

e.g. the government have tried to control the Mississippi River by building or strengthening levees for a distance of 3000 km. This work is very expensive and requires maintenance [4]. Meanders were straightened to allow the water to flow faster downstream thereby preventing flooding [5].

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.

AVAILABLE
MARKS

Level 3 ([6]–[7])

An answer which addresses all aspects of the question with good geographical detail and includes at least two facts/figures relating to the question for top Level 3. Some judgement or conclusion needed for top Level 3.

e.g. The Mississippi River in the USA has been managed for over 100 years to improve navigation and prevent flooding. The traditional techniques, e.g. building levees for 3000 km and straightening meanders for 1750 km, are very expensive and require regular maintenance. Such strategies may not be sustainable due to cost and environmental problems. An alternative approach introduced recently reunites the river with its floodplain on some stretches. The US Conservation Service has spent \$25 million on creating safe flood zones for conversion to natural conditions. [6]

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.

This method is more sustainable because it is environmentally friendly and maintains natural habitats on the floodplain. [7]

AVAILABLE MARKS
50

Theme B: Our Changing Weather and Climate

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MARKS

- 2 (a) Study **Fig. 7** which shows a weather system over the British Isles on a day in July 2009. Answer the following questions.

- (i) Complete the following to describe the weather at Weymouth.

Pressure at X is **1028 mb**
Wind direction at Weymouth is **north east**

(2 × [1])

[2]

No alternative answer accepted.

- (ii) Explain how the weather system in **Fig. 7** caused the hot, sunny weather that people were able to enjoy on the beach in Weymouth as shown in **Fig. 8**.

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

Level 1 ([1])

A simple statement relating to the high pressure of an anticyclone, e.g. it is sunny/dry/not raining because of the high pressure.

Level 2 ([2])

A simple reason or consequence

e.g. high pressure brings dry weather because there are no fronts

e.g. or it is sunny because there are no clouds in areas of high pressure.

Level 3 ([3])

A reason which is elaborated

e.g. in areas of high pressure the air is sinking/warming up and so there are no clouds and this means it is warm/sunny during the day and there are high temperatures. [3]

- (b) (i) Explain how a barometer measures the pressure of the atmosphere.

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

Level 1 ([1])

A simple statement

e.g. the mercury level rises and falls in a mercury barometer **or** the lid of the box moves in and out in an aneroid barometer.

Level 2 ([2])

Some understanding of how the mercury barometer works by balancing the weight of mercury in the glass tube against the weight of the air **or** increased pressure causes the lid of the metal box to move inwards in an aneroid barometer,

e.g. when the pressure of the air is high, the weight of the air pushes up the level of the mercury in the glass tube. When the pressure of the air falls, the level of mercury in the glass tube also falls as the mercury can flow into the container.

Level 3 ([3])

Good understanding of how the mercury barometer works by balancing the weight of the mercury in the glass tube against the weight of the air/air pressure **or** understanding of how the movement of the lid of the metal box responds to the pressure of the air and is linked to a rotating pointer moving over the scale on the face of the aneroid barometer,

e.g. the glass tube about 1 metre tall is placed upside down in a container and contains a column of mercury with a vacuum at the top. When the pressure of the air is high, the weight of the air pushes up the level of the mercury in the glass tube and the reading on the glass tube is high. If the weight of mercury is greater than the air pressure, the mercury level falls. This is because the mercury in the glass tube can fall as the mercury can flow down into the container. [3]

Accept a valid alternative answer relating to the aneroid barometer.

- (ii) Weather stations on land collect data which is used to create a weather forecast. Name **two** other sources of data which can be used to create a weather forecast.

Any **two** of weather balloons, ships, aircraft, satellites, buoys.

(2 × [1])

[2]

- (c) Depressions are weather systems which can have both positive and negative effects on the economy of places. Description of **one** positive and **one** negative effect of depressions on the economy, referring to different places in the answer.

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

Level 1 ([1]–[2])

Simple statements relating to the positive and negative effects on the economy during depressions with no place named and no clear link to the economy,

e.g. cold fronts bring heavy rainstorms which could disrupt sporting or other outdoor events [1] and they also bring rain for crops to grow. [2]

Level 2 ([3]–[4])

Statements relating to both positive and negative effects on the economy during depressions with one clearly linked to the economy [3] and both linked to the economy with named place for [4],

e.g. cold fronts bring heavy rainstorms which could disrupt sporting or other outdoor events such as motor racing at Brands Hatch, costing the organisers money; they also bring rain helping farmers to grow crops such as potatoes and barley which enables farmers in Northern Ireland to make a profit. [4]

Accept valid alternative answers.

- At least one named place for top **Level 3** [4]

- (d) Study **Fig. 9** which shows two sources of climate change. Answer the questions which follow.

AVAILABLE
MARKS

- (i) Identify the cause of climate change from each source shown in **Fig. 9**.

A: burning fossil fuels in power station/gases from power stations/
industry – appropriate gases named **not** smoke.

B: gases from volcanoes/ash clouds from volcanoes/volcanoes

(2 × [1])

[2]

- (ii) Describe how **one** of the causes shown in **Fig. 9** can lead to climate change.

No marks for naming the chosen cause.

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

Level 1 ([1])

A simple statement,

e.g. volcanoes erupt producing gas/ash **or** power stations burn fossil
fuels creating pollution.

Level 2 ([2])

A statement with some explanation,

e.g. volcanoes erupt producing ash which blocks the incoming rays of
the sun.

Level 3 ([3])

A statement with explanation clearly linked to climate change,

e.g. volcanoes erupt producing ash which blocks the incoming rays
of the sun because the gases, ash or SO₂ reflect the sun's rays and
reduces temperatures so causing climate change.

[3]

Accept valid alternative answers relating to pollution from power
stations.

- (e) Name a country you have studied and evaluate the actual or possible future effects of climate change on the environment and economy of this country.

Name of country (The country may be a MEDC or LEDC) (no mark).

At least two effects – one positive and one negative – should be discussed
for environment and economy.

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

Level 1 ([1]–[2])

Simple statements of effect which may only be positive or negative, e.g. it
will get warmer/wetter [1] so more crops can grow [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 reasonably clear. A limited range of specialist terms is
used appropriately.

Level 2 ([3]–[4])

Statements with consequences which are both positive and negative, e.g. it will be warmer and so there will be higher yields of crops in the UK and it will be warmer and so there will be more pests and diseases. [3]
 e.g. it will be warmer and so there will be higher yields of crops in the UK and it will be warmer and so there will be more tropical pests and diseases which may attack crops. [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 ([5]–[6])

For top Level 3 an answer which addresses all aspects of the question with good geographical detail and includes at least two fact/figures relating to the country named. Some judgement or conclusion needed for full evaluation.

e.g. One benefit of climate change to the UK is that the temperatures will increase. This warmth will enable farmers to earn more income by producing higher yields of crops such as maize, grapes or sugar beets in SE England. However, the extra warmth could bring more pests and diseases such as aphids and mites. These could attack crops, lowering farmer's income or malaria could increase due to the spread north of mosquitoes.

However, more warm weather will increase tourism as people will holiday in the UK and these tourists will spend money earning more money for tourist resorts, such as Blackpool [5]. However, overall there could be more benefits to the economy but negative effects in the environment. [6]

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.

AVAILABLE
MARKS

25

Theme C: The Restless Earth

AVAILABLE
MARKS

- 3 (a) Study **Fig. 10** which shows the world distribution of crustal plates and volcanoes. Answer the question which follows.
Describe the world distribution of volcanoes shown on map, referring to named places in your answer.

Credit each valid correct statement up to a maximum of [4].

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

Level 1 ([1])

A simple general statement or one named place,
e.g. volcanoes are along plate boundaries or along the west side of the Pacific Ocean **or** list of places with no mention of plate boundaries e.g. Japan/Iceland.

Level 2 ([2]–[3])

A statement with two accurate named places and reference to plate boundaries for full Level 2 [3],
e.g. volcanoes are along plate boundaries such as around the Pacific called the Ring of Fire and down the west side of North America (Cascade Range). There is an East/West belt through the Mediterranean Sea. [3]
• Reference to plate boundaries and one named place for [2]

Level 3 ([4])

A statement with two accurate named places and reference to plate boundaries and to one exception such as volcanoes in the centre of the Pacific Ocean for full Level 3 [4],
e.g. volcanoes are along plate boundaries such as around the Pacific Ocean called the Ring of Fire and down the west side of North America (Cascade Range). There is an East/West belt through the Mediterranean Sea and a North/South belt down the middle of the Atlantic Ocean. There are also volcanoes in the middle of the Pacific Ocean which are not on a plate boundary. [4]

Accept valid alternative answers relating to other named places.

- (b) Study **Fig. 11** which shows Slemish Mountain which is a volcanic plug. Answer the question which follows.
Explain how a volcanic plug such as Slemish Mountain was formed.

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

Level 1 ([1])

A simple statement,
e.g. it is made from magma.

Level 2 ([2])

A statement with a consequence,
e.g. a plug is made from magma which hardens as it rises to form a volcano.

Level 3 ([3])

A statement with a consequence and elaboration which uses correct geographical terminology,
e.g. a plug is made from magma which hardens as it rises inside the vent to form a volcano and the surrounding rock is eroded away leaving the hard rock behind. This is the plug. [3]

- (c) (i) Complete **Table 1** below to show another example of these rock types.

Table 1

Igneous	Sedimentary
Granite (Given)	Sandstone (Given)
Basalt	Limestone

(2 × [1])

[2]

Accept valid alternative rock types.

- (ii) Explain how sedimentary rocks were formed.

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

Level 1 ([1])

A simple statement,
e.g. erosion of the land creates small fragments of rock or sediments.

Level 2 ([2])

A statement with a consequence,
e.g. the layers of sediment which come from eroded rocks build up in layers on the sea bed over a long period of time.

Level 3 ([3])

A statement with a consequence and elaboration which uses correct geographical terminology,
e.g. the layers of sediment which come from eroded rocks build up in layers on the sea bed; compression of the layers squeezes out air and water over a long period of time to create new rock called sedimentary rocks.

[3]

- (d) Study **Fig. 12** which shows a collision plate boundary. Answer the questions which follow.

- (i) Add labels at A and B on **Fig. 12** to indicate the following two layers:
Mantle; Crust.

A – Crust

B – Mantle

(2 × [1])

[2]

No alternative answer accepted.

- (ii) Explain how fold mountains are formed at a collision plate boundary.

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

Level 1 ([1])

A simple statement, indicating understanding of the meaning of collision boundary,
e.g. two plates (each carrying a landmass) move towards each other.

AVAILABLE
MARKS

Level 2 ([2])

A statement with a consequence,
e.g. two plates (each carrying a landmass) move towards each other so that the sediments/rocks between them are crumpled up.

Level 3 ([3])

A statement with a consequence and elaboration which uses correct geographical terminology,
e.g. two plates, each carrying a landmass, move towards each other so that the sediments between them or the crustal rocks are crumpled up and they are pushed or folded upwards to form ranges of high mountains. [3]

- (e) Earthquakes may occur far away from plate boundaries. Name an earthquake in the British Isles which you have studied. Outline the cause of this earthquake and describe and explain fully **one** impact this earthquake had.

Name an earthquake,
e.g. Market Rasen in Lincolnshire. (no mark)

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

Cause**Level 1 ([1])**

A simple statement,
e.g. the rocks moved/a fault occurred in the rocks.

Level 2 ([2])

A statement with a consequence,
e.g. the rocks moved because stress had built up at a fault and was suddenly released. [2]

Impact**Level 1 ([1])**

A simple general statement,
e.g. some parts of buildings collapsed/people were hurt.

Level 2 ([2])

A statement with consequence,
e.g. some people were hurt when a chimney collapsed.

Level 3 ([3])

A statement with a consequence and elaboration containing a fact/figure/ place relating to the named earthquake,
e.g. some people were hurt when chimneys/roofs of houses collapsed in South Yorkshire
or
e.g. the old church in Market Rasen is a Grade II listed building and a stone cross fell, causing £10 000 worth of damage. [3]

Accept valid alternative answers.

NB Maximum Level 1 for cause and Level 1 for effect if no named place or earthquake outside British Isles. i.e [1] each

AVAILABLE
MARKS

- (f) Attempts have been made to manage the impacts of earthquakes. Describe one long term management strategy used to manage the effects of an earthquake you have studied.

Location of earthquake (no mark).

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

Level 1 ([1])

A simple general statement,

e.g. make buildings more earthquake-proof/warn people more quickly.

Level 2 ([2])

A statement with a consequence,

e.g. make buildings more earthquake-proof by adding cross-beams so that shockwaves are spread through the structure and the building won't fail in future.

Level 3 ([3])

A statement with a consequence and elaboration containing a fact/figure/ place relating to the named earthquake,

e.g. make buildings more earthquake-proof as in Kobe in Japan they added cross-beams so that shockwaves are spread through the building,

e.g. Kansai International Airport will be able to survive severe earthquakes because of this high-tech structure,

e.g. a tsunami warning system was put in place around the Indian Ocean in 2006 using 25 new seismograph stations which were set up to relay information to national tsunami information centres so that people could be alerted in future earthquakes. [3]

Accept valid alternative answers.

Total

**AVAILABLE
MARKS**

25

100