



General Certificate of Secondary Education
2011

Geography

Unit 1:
Understanding Our Natural World

Higher Tier

[GGG12]

MONDAY 13 JUNE, MORNING

MARK SCHEME

Theme A: The Dynamic Landscape		AVAILABLE MARKS
1	(a) (i) The height of the land on the A149. – As defined by the GR for the spot height Award [1] for 3 metres	[1]
	(ii) Straight line distance from the Parking to Pits Point. Answer is 4.6 km Award [1] for answers in the range 4.4 to 4.49 km or 4.71 to 4.8 km Award [2] for answers in the range 4.5 to 4.7 km	[2]
	(iii) The direction of Blakeney Point from Weybourne Award [1] for <i>North West</i>	[1]
	(iv) Using map evidence state three activities that tourists could enjoy. Credit any acceptable features attractive to tourists or facilities for tourists. Grid references not required e.g. Sandy beach, attractive cliffs, cliff walks, Nature Reserve, National Trust, Viewpoint, Camping, Picnic sites, hotels, Caravan sites etc. Award [1] per correct answer	[3]
	(v) Blakeney Point GR 0046 is an example of a spit. Explain how this feature formed. Award [0] for a response not worthy of credit.	
Level 1 ([1]–[2]) Candidates make reference to the movement of sand e.g. ● A spit is formed as sand moves along the coast.		
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]) Reference is made either to the conditions required for a spit to develop or to the process involved e.g. ● Sand is moved along the beach by longshore drift and sand accumulates and forms a narrow ridge. OR ● Spits form in shallow water where there is a change in the direction of the coast and where longshore drift operates.		
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])

Reference is made to both the conditions required for a spit to develop and to the process involved e.g.

- Sand is moved along the beach by longshore drift, sand or shingle accumulates and forms a narrow ridge where the direction of the coast changes. Spits such as Blakeney Point form where there is a good supply of sand or shingle.

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. [6]

(vi) State three differences between destructive and constructive waves. Credit comparative statements e.g.

- Destructive waves have a stronger backwash while constructive waves have a stronger swash.
- Destructive waves are high in relation to their length, constructive waves are longer.
- Destructive waves are more frequent than constructive waves. (15 per minute compared to 6–9 per minute)
- Destructive waves create steep beaches while constructive waves create gently sloping beaches.
- Destructive waves have a stronger backwash.

Award [1] per valid comparative statement. [3]

(b) Explain how sea walls and groynes work.

Sea Wall

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

Award [1] for a basic statement e.g.

- Concrete walls built along the coastline.

Award [2] for a valid statement and a consequence e.g.

- Curved concrete walls built to protect against storm waves.

Award [3] for a valid statement, consequence and elaboration e.g.

- These are tall concrete walls built at the back of beaches. They may have a curved shape which is designed to deflect the erosive energy of the wave. [3]

Groynes

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

Award [1] for a basic statement e.g.

- Fences built along the beach.

Award [2] for a valid statement and a consequence e.g.

- Fences built along the beach to stabilise sand/trap sand.
- Fences built along the beach to stop the effect of longshore drift.

AVAILABLE
MARKS

Award **[3]** for a valid statement, consequence and elaboration e.g.

- Groynes are wooden walls built seawards on a beach e.g. every 50 metres, to stop the sand being washed away by longshore drift. The material is trapped behind the groynes at regular intervals along the beach and this helps retain the sand along the beach.
- Groynes are wooden fences built at right angles to the coast along a beach. They slow down longshore drift and encourage the deposition of sand building up the beach. However they can cause erosion further along the coast as beach material cannot move naturally by longshore drift. [3]

(c) Conflicting nature of human activity on coastlines.

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

Award **[1]** for a statement relating to a landuse e.g.

- High rise hotels can block the sea view.
- Industry can pollute the coastline.

Award **[2]** for a valid conflict with consequence.

- The need for more hotels can leave no space for housing.
- Industries such as ship building can make the coastline unattractive putting off visitors.

Award **[3]** for a valid conflict with consequence and elaboration of a named place e.g.

- The requirements of large numbers of tourists can be in conflict with residential land use. For example in Jamaica there is a three storey height restriction law for housing and hotels so the skyline does not become blighted. The building of hotels reduces the land available for residential use.
- Increased demand for hotel sites and facilities for tourists with a sea view means that there is great pressure on landowners and councils to develop coastal areas which can make coastal homes too expensive for locals. In Florida this has resulted in homes being built in areas liable to coastal flooding.
- Shipbuilding and ship-breaking industries are commonly seen on coasts. These can be unsightly and are in conflict with those who wish to keep the coastline attractive for tourists. In Gujarat, India the Alang-Sosiya ship breaking yard has proved controversial.
- Railways and roads that follow coasts cost a lot of money to maintain and can collapse into the sea as in Holderness England. Locals need these roads maintained for access. Also many ports have had to be relocated to deeper water or are dredged to make them deeper to accommodate supertankers. This can result in conflicts with local residents who wish to maintain their coastal views. [3]

AVAILABLE
MARKS

(d) (i) 1. Describe the changes in the load with distance downstream.

AVAILABLE
MARKS

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

Level 1 ([1]–[2])

Up to 2 basic analytical statements with no figures

- The load gets smaller. [1]
- The pebbles get smoother. [1]

OR

- One statement with two figures. [2]

Level 2 ([3])

Analytical statements with some elaboration. Candidates address BOTH load size and shape. e.g.

- The load decreases in size with distance downstream and in addition it also becomes more rounded and less angular. + 2 fact/figures for one aspect e.g.
1 item with no facts/figures.

Level 3 ([4])

Candidates describe both the changes in the size and shape of the load downstream and refer to shapes in the Powers' scale of roundness and use 2 fact/figures for each aspect e.g.

- The load becomes smaller downstream for example 0.8 km from the source the average length is 12.90 cm while at 8.9 km from the source the load had reduced to 7.90 cm, a difference of 5 cm. In addition the load was angular at stop 1, further downstream it became more rounded until at stop 5 it was well rounded. [4]

2. Explain how these changes in the load occur.

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

Level 1 ([1]–[2])

A basic explanation e.g.

- It is eroded. [1]
- The load gets smaller as it is eroded. [1]
- The load gets smoother as it is eroded. [1]

2 marks for another contributing statement but not fully linked.

Level 2 ([3]–[4])

A valid statement and consequence. Candidates should refer to both load size and shape e.g.

- The rocks hit against each other and against the bed and banks causing them to break up into smaller pieces. The rocks are also eroded making them smoother the longer they are in the river.

AVAILABLE MARKS

Level 3 ([5])

Candidates explain both the reduction in load size and in load shape with valid statements with a consequence and elaboration e.g.

- As the load travels downstream, rocks hit against each other, a process called attrition. This means the edges of some rocks will get broken off making them smaller further from the source. In addition the rocks become smoother due to the effect of the water and abrasion or the grinding of the rock fragments against the bed and banks. [5]

(e) Formation of a waterfall.

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

Level 1 ([1]–[2])

Candidates make reference to the process of erosion or describes it e.g.

- A waterfall happens when a river flows over a layer of hard rock and undercuts the soft rock underneath by erosion creating a waterfall.

Level 2 ([3]–[4])

The answer gives a clear indication that there are a number of stages which lead to the formation of a waterfall but not all are given. For [3] two stages must be identified. e.g.

- A waterfall is formed when a layer of hard rock lies on top of a layer of soft rock. As the river passes over the hard rock, the soft rock below is eroded quickly to form a step in the river bed. A plunge pool forms at the base of the waterfall and over time the overhanging rock collapses into it.

Level 3 ([5])

All stages in the formation of a waterfall are identified with appropriate terminology used e.g.

- A waterfall is formed when a layer of hard rock lies on top of a layer of soft rock. As the river passes over the hard rock, the soft rock below is eroded more quickly than the hard rock so there is a step in the river bed. Eventually this becomes deeper causing a waterfall. The drop gets steeper as the river erodes the soft rock beneath by abrasion and hydraulic action. This results in a plunge pool at the base of the waterfall. The erosion gradually undercuts the hard rock and eventually the unsupported overhanging rock collapses into the plunge pool. A steep sided gorge is formed as the waterfall gradually retreats upstream. [5]

(f) (i) Describe one physical and one human cause of flooding on a river in the British Isles.
e.g. the River Derwent.

AVAILABLE
MARKS

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

Level 1 [1] A basic statement relating to physical or human cause
e.g.

- Heavy rainfall.
- Snow melt.
- Removal of peat.
- More houses built.

Level 2 ([2]–[3])

Candidates refer to both a physical and human cause of flooding with a statement and a consequence e.g. for a named river.

- Heavy rainfall fell on ground which was already saturated from previous rainfall leading to flooding on the R. Derwent. The ground could not absorb any more water as peat had been removed from the area reducing the capacity of the soil to hold more floodwater.

Level 3 ([4])

Candidates suggest valid physical and human causes of the flooding. Answers to include a valid statement, consequence and elaboration e.g.

- There was heavy rainfall (over 250 mm) 28 February–11 March on the North Yorks Moors. This fell on already saturated ground leading to flooding. In addition other areas of the floodplain were being built on e.g. the new housing estate at Malton. The extra tarmac surfaces reduced infiltration and increased surface run off causing flooding.
- There was over 250 mm rainfall in February–March which was added to by the melting snow at this time of year (Spring) leading to flooding. In addition the removal of peat in the source area meant that the soil was able to hold less water resulting in quick saturation and flooding. [4]

(ii) Evaluate the extent to which river management strategies used on a river outside the British Isles can be considered sustainable. e.g. The Mississippi.

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

AVAILABLE MARKS

Level 1 ([1]–[3])

Candidates provide a limited factual account of 1 or 2 strategies used on the named river or provide a factual account with no reference to a named river outside the British Isles e.g.

- Levees have been built along the river to enclose the river channel and stop the river flooding.
- or one strategy with some evaluation.

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 at least 2 strategies used on the named river with limited evaluation of the extent to which the strategies can be considered sustainable e.g.

- The US Corps of Engineers have tried to control the Mississippi River for over 100 years by building or strengthening levees and straightening meanders. This work is very expensive and requires maintenance. Continued large scale flooding suggests this strategy will never work. OR
- 2 facts/figures relating to strategies with no evaluation [4]
- 2 facts/figures with some evaluation [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.

Level 3 ([6]–[7])

In evaluating at least 2 river management strategy the candidate demonstrates a clear understanding of the concept of sustainability and includes 2 facts/figures places relating to the named river for top L3.

- The Mississippi has been managed for over 100 years to improve navigation and prevent flooding. Levees have been raised by 15 metres along a 3000 km stretch of the river and meanders have been straightened over a stretch of 1750 km long. These traditional techniques of building levees and straightening the meanders are very expensive and require regular maintenance. Such strategies may not be sustainable due to cost and environmental problems. In an alternative approach the US Conservation service has spent \$25 million on buying flood prone farmlands for conversion to natural conditions. These areas do not require maintenance and have no negative environmental impact and are therefore sustainable.

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 whole range of specialist terms is used skilfully and with precision.

[7]

50

AVAILABLE MARKS

Theme B: Our Changing Weather and Climate		AVAILABLE MARKS
2	(a) (i) Name the type of cloud at X Cirrus	[1]
	(ii) State the type of cloud associated with thunderstorms Cumulo-nimbus	[1]
	(b) Describe a rain gauge and explain how the amount of precipitation is measured.	
	Award [0] for a response not worthy of credit.	
	Level 1 ([1]) A simple statement e.g. a rain gauge is a jar which collects rain.	
	Level 2 ([2]) A more developed answer using correct terms e.g. it is a cylinder which catches rainfall.	
	Level 3 ([3]) A detailed answer using correct terms e.g. a rain gauge is a cylinder which catches rainfall and has a funnel which directs the rain into a measuring flask.	[3]
	Explanation of how precipitation is measured.	
	Level 1 ([1]) A general answer e.g. the rain is measured using a scale on the collecting jar.	
	Level 2 ([2]) A detailed answer e.g. <i>each day</i> the measuring flask is taken out and the amount of rainfall is recorded.	[2]
(c) (i)	State the meaning of the term synoptic chart .	
	Level 1 ([1]) A basic answer e.g. a map showing the weather.	
	Level 2 ([2]) A full answer e.g. a weather map showing the isobar pattern and the symbols for the weather.	[2]
(ii)	State the name of the weather system located over the British Isles. Depression.	[1]
(iii)	The temperature in Norwich will change as this weather system passes. Describe and explain how the temperature will change	
	Award [0] for a response not worthy of credit.	

AVAILABLE MARKS
Level 1 ([1]) Refers to one change only e.g. the temperature will go either up or down.
Level 2 ([2]) Refers to both i.e. The temperature will go up and then down. [2]
Explanation
Level 1 ([1]) A simple statement e.g. The temperature will rise after the front.
Level 2 ([2]) A statement which refers to the warm front and warm sector and cold front and cold air passing across Norwich or fully explains temperature increasing or decreasing but not both .
Level 3 ([3]) An explanation which accurately links the rising and falling temperatures at Norwich to the passing of firstly the warm front and warm sector with Tropical Maritime air mass and secondly the passing of the cold front and cold Polar Maritime air. (Answer could refer to the direction of cold air mass from NW) [3]
(d) (i) Explain one way in which an erupting volcano may change the climate.
Award [0] for a response not worthy of credit.
Level 1 ([1]) A brief statement e.g. the volcano ejects SO ² or ash or water vapour etc.
Level 2 ([2]) Some explanation is provided e.g. the SO ² or ash ejected by the volcano blocks out the sunlight or reflects Solar Radiation.
Level 3 ([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 sulphuric acid in the atmosphere which reflects solar radiation and this lowers the temperature and so cools the climate. [3]
(ii) State two effects of climate change (one positive and one negative). e.g. Positive: higher crop yields e.g. Negative: more pests and diseases e.g. drought (causes hosepipe bans) e.g. more rain causes flooding (2 × 1) = [2]

(iii) Explain one sustainable strategy which could be used to deal with climate change.

There are several different strategies, but only **one** needs to be addressed in this question.

The strategy does not have to refer to a particular case study country but top level 3 answers could refer to places.

Alternatives include ref to:—

- International cooperation e.g. the Kyoto Agreement.
- Slowing rates of deforestation.
- Using alternative sources of energy.

AVAILABLE MARKS

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

Level 1 ([1]–[2])

A simple statement e.g. cut down use of fossil fuels or burn less oil.

Level 2 ([3]–[4])

A more detailed explanation e.g. use alternative renewable sources of energy e.g. wind or tidal power which produce less pollution than using fossil fuels e.g. coal or oil.

Level 3 ([5])

A fully elaborated explanation e.g. use alternative renewable sources of energy such as wind or tidal power and less oil or coal (e.g. in the UK there is a target of 20% of electricity produced from renewable sources by 2020); renewable energy produces less CO₂ and so would cut emissions of greenhouse gases which trap heat from the sun and is a human cause of climate change.

[5]

25

Theme C: The Restless Earth**AVAILABLE MARKS**

3 (a) (i) Complete Table 1 by writing in the names of the first and last rocks in the table.

Name of rock
Granite [1]
Sandstone (given)
Slate [1]

[2]

(ii) Choose one of the rocks from Table 1 and explain how it was formed.

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

Credit igneous, sedimentary, metamorphic to L3.

If any other rock is chosen, then award **[2]** maximum.

Level 1 answer **[1]** will be a basic statement on how any rock might be made e.g. it's made from molten rock that hardens.

Level 2 answers **[2]** will be an incomplete explanation of a certain rock's formation e.g. granite is made from molten rock which hardens under the ground.

Level 3 **[3]** answers will give a full explanation of how either granite, slate or sandstone 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]**

(b) Explain the formation of a lava plateau.

Award **[0]** for a response not worthy of credit, such as the Antrim Plateau in Northern Ireland.

Level 1 ([1])

May be a basic explanation that could relate to any igneous feature e.g. molten material cools to make the plateau.

Level 2 ([2–3])

A more detailed explanation that stops short of all steps in the formation e.g. Molten material comes to the earth's surface, flowing onto a flat surface rather than making a volcano shape, and cools to make a plateau.

Level 3 ([4])

A full explanation of the formation of a lava plateau e.g. molten magma from the mantle comes to the surface, where it can come through lines of weakness in the crust called fissures, large outpourings of lava occur, which will harden into large lava plateaux made of basalt. **[4]**

(c) (i) Name the group of islands to the north of Haiti.

Bahamas

[1]

(ii) Explain why earthquakes in LEDCs tend to cause more deaths than those in MEDCs.

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

Answers should focus on human factors, such as poor infrastructure, lack of co-ordinated medical care, poorly built housing etc. If they stray to look at general reasons such as strength of the quake or time of day, then award level 1 max. Higher population density in LEDC not acceptable.

Level 1 ([1–2])

A partial explanation which notes at least one relevant reason e.g. Houses in LEDCs are poorly built and collapse during an earthquake killing more people.

Level 2 ([3–4])

A fuller explanation of two expanded points or 3/4 relevant reasons being noted.

e.g. Houses in LEDCs are poorly built and collapse during an earthquake killing more people, also the medical system is less well funded than in MEDCs so it can't cope with the number of injured people after a quake.

[4]

(iii) Type of plate margin found near Port-au-Prince.

conservative

[1]

(iv) Explain why tectonic plates move.

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

The candidate should discuss the structure of the earth within the answer, noting the idea of crust, mantle and core. They should make reference to the fact that the core is very hot and causes convection currents in the mantle.

e.g. Level 1 [1] a simple reason e.g. because they sit on the mantle.

Level 2 [2–3] a more detailed, but incomplete explanation e.g. because they sit on the mantle which is moving as it is heated by the core [3].

Level 3 [4] a full explanation e.g. because tectonic plates sit on the mantle, which is also moving due to convection currents generated by heat from the core at the centre of our planet. [4]

AVAILABLE
MARKS

(d) Describe the impacts caused by an earthquake in the British Isles.

AVAILABLE MARKS

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

Award max **[2]** if they discuss an earthquake outside of the British Isles. No marks to be awarded for naming a place in the UK.

Level 1 ([1–2])

An answer which gives some general impacts any earthquake might have.

e.g. Some buildings fell down and people got hurt.

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

Level 2 ([3–4])

An answer which gives some good information about an earthquake, but lacks details specific to an earthquake in the British Isles.

e.g. In February 2008 an earthquake hit a town in England. It caused damage to the surrounding area. A stone cross fell from a church and several people were hurt, like a man who suffered broken bones when a chimney fell on him.

Candidates present 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 the meaning is clear. A good range of specialist terms is used appropriately.

Level 3 ([5–6])

A detailed answer which outlines at least three impacts of an earthquake in the British Isles; including at least two specific facts/figures.

e.g. In February 2008 an earthquake measuring 5.2 on the Richter Scale hit Market Rasen in England. It caused damage to the surrounding area. A stone cross fell from a church and hit the building's roof, causing about £10,000 of damage. Several people were hurt, like a man in South Yorkshire who suffered broken bones when a chimney fell on him. Also people heard a strange roaring noise when the earthquake happened.

Candidates present and organise efficiently, 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 flawless accuracy so the meaning is clear. A wide range of specialist terms is used skilfully and with precision.

[6]

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Total

100