

# Paper 1

## Example answers

### Question styles:

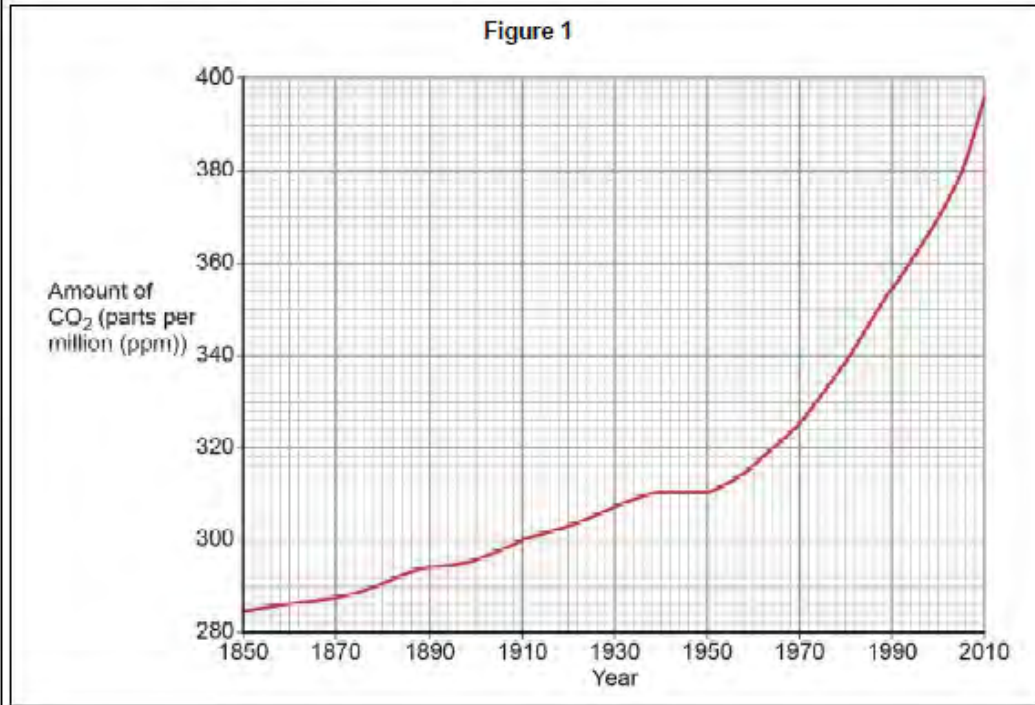
- Multiple choice questions
- 2 mark questions - Resource based. Point + Development.
- 4 mark questions -
- 6 mark questions - must refer to evidence off resource,  
2 x Point + Development + Development
- 9 mark questions -
  - 1-3 - Basic ideas no development
  - 4-6 - Good ideas started to be developed (NO facts)
  - 7 -9 - Facts needed and ideas need to be fully developed. P+D+D.

## Section A The challenge of natural hazards

Answer all questions in this section.

### Question 1 The challenge of natural hazards

Study Figure 1, a graph showing changes in the amount of carbon dioxide (CO<sub>2</sub>) in the atmosphere.



#### Mark Scheme

**One mark** for idea of steady increase followed by rapid rise in CO<sub>2</sub> levels/exponential rise.

**Second mark** for use of data shown on graph or for data manipulation, eg CO<sub>2</sub> concentration increased by almost 100 ppm in 150 years.

No credit for increase in CO<sub>2</sub> levels without qualification.

AO4 = 2 marks

#### Student response A

The amount of carbon dioxide increases continuously from 1850 to 1940 then it stays the same for 10 years before it increases continuously.

#### Examiner commentary A

There is some recognition of change over time – [1 mark]

#### Student response B

From 1850 to 2010 there has been a general increase in the amount of CO<sub>2</sub> in the atmosphere from 285ppm to 396ppm. The increase is gradual until 1940, then levels stayed the same until 1950 before rising rapidly after this.

#### Examiner commentary B

Data is used to support the overall increase and the varying rate is identified – [2 marks]

Your answer:

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**1.2** Outline **one** reason why the concentration of carbon dioxide in the atmosphere has changed over time. **[2 marks]**

## Mark Scheme

Credit **one** reason only. Valid developed point awarded 2 marks.

**One mark** for appropriate reason, eg

- burning of fossil fuels (1)
- manufacturing of products like cement (1)
- deforestation (1).

Allow natural factors such as volcanic activity (1).

**Second mark** for developed reason, eg

- thermal power stations burn fossil fuels which release gases including carbon dioxide which build up in the atmosphere (2).

AO2 = 2 marks

### Student response A

One reason why the concentration of carbon dioxide has risen can be because of the growth of factories and carbon released from trees.

### Examiner commentary A

Two partial reasons are given, even though only one is required, but neither is clear enough for a mark – [0 marks]

### Student response B

Deforestation has caused carbon dioxide in the atmosphere to increase. This is because when trees are cut down carbon is released into the atmosphere.

### Examiner commentary B

'Deforestation' is correctly identified as a reason but there is no subsequent clear development as to how this leads to an increase in carbon dioxide in the atmosphere – [1 mark]

### Student response C

It's changed over time because people are cutting down trees which results in CO<sub>2</sub> levels to increase rather than decreasing. This is because trees absorb CO<sub>2</sub> and release oxygen so cutting them down results in higher CO<sub>2</sub> levels in the atmosphere.

### Examiner commentary C

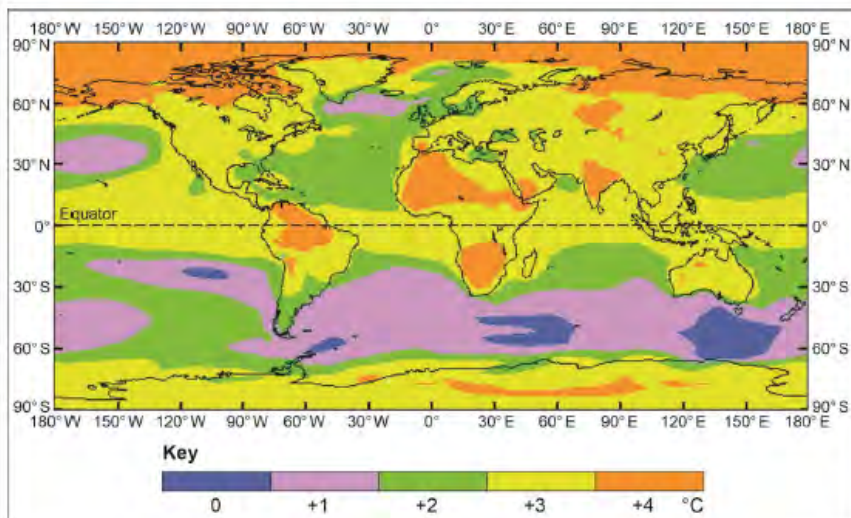
Deforestation is again identified here (although the technical term is not given) and there is clear development of how this leads to an increase in carbon dioxide in the atmosphere – [2 marks]

Your answer:

[illegible]

Study Figure 2, a map showing how global surface temperatures might change by 2070.

Figure 2



0 1 . 3 Using Figure 2, which two of the following statements are true?

Shade two circles only.

- A Changes in temperature are likely to be lowest in equatorial areas. ☐
- B Temperatures in Asia are likely to rise by 1 °C. ☐
- C Temperatures over most of the sea areas north of 60° N are expected to increase by 4 °C. ☐
- D Temperatures over the whole of Africa are likely to rise by 3 °C or 4 °C. ☐
- E The central parts of the continents are expected to have the lowest rise in temperature. ☐
- F The rise in sea temperatures is likely to be greatest south of the equator. ☐

When looking at maps always look at the key this will help answer the question.





A satellite image of Hurricane Georges, showing its eye and spiral cloud bands. The hurricane is located in the Gulf of Mexico, east of the Yucatan Peninsula. A black arrow points to New Orleans on the Louisiana coast. A scale bar at the bottom right indicates 0 to 500 km. A north arrow is in the top right corner. The image is overlaid with a green grid. The text 'N:\GCSE Reform\Paper 1\P1 Fig05.jpg' is visible in the bottom right corner of the image area.

- The focus is on weather conditions. No credit for describing the structure of the storm, its causes or responses.

Answers must apply understanding of the features of tropical storms to interpret the resource.

**[4 marks]**

Level	Mark	Description
2 (Clear)	3-4	AO3 Demonstrates accurate interpretation of weather conditions through the application of relevant knowledge and understanding to the resource. AO4 Makes clear and effective use of the satellite image to support the forecast of weather conditions.
1 (Basic)	1-2	AO3 Demonstrates some interpretation of weather conditions through the application of limited relevant knowledge and understanding to the resource. AO4 Makes limited and piecemeal use of the satellite image to support the forecast of weather conditions.

The weather in New Orleans over the next 24 hours would be extremely windy, large amounts of rain, possible risk of flood as the storm surge could occur.

The answer gives a list of appropriate weather conditions which are likely to affect the area of New Orleans, as indicated by the satellite image – [2 marks – Level 1]

New Orleans over the next 24 hours would suffer from extreme winds and storm surges as the storm pushes water from the sea into New Orleans. This, coupled with the incredibly heavy rainfall from the clouds, would cause major flooding.

There is some use of the satellite image implied, with reference to the cloud and heavy rainfall. Some links are made and the weather conditions are correctly forecasted. [3 marks – Level 2]

Your answer:

[illegible]

- 1.9 Choose either an earthquake or a volcanic eruption. Assess the extent to which primary effects are more significant than secondary effects. Use Figure 5a or 5b and an example you have studied.

[9 marks]

Mark scheme

Level	Marks	Description
3 (Detailed)	7–9	<p>AO1 Demonstrates detailed knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the relative significance of primary and secondary effects on people and the environment.</p>
2 (Clear)	4–6	<p>AO1 Demonstrates clear knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the significance of primary and secondary effects on people and the environment.</p>
1 (Basic)	1–3	<p>AO1 Demonstrates limited knowledge of the primary and secondary effects of a tectonic hazard on people and the environment.</p> <p>AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of a tectonic hazard.</p> <p>AO3 Demonstrates limited application of knowledge and understanding in evaluating the significance of effects on people and the environment.</p>
	0	No relevant content.

The command phrase is 'to what extent', so the focus of the question is an evaluation of the relative importance of primary and secondary effects. There should be a discursive element which addresses whether, and to what extent, primary effects are more significant than secondary effects.

Credit only effects (not causes or responses). Answers should refer to one of the photo images as well as a named example, although the two do not have to be balanced in coverage. The distinction should be made between primary impacts, which occur as a direct consequence of the earthquake or volcanic eruption and secondary impacts which occur as a result of the primary effects.

#### Earthquakes

Expect details of the event itself with data to support points.

Allow wide range of effects, eg

##### Primary effects

- Collapsing bridges and buildings; homes may be destroyed.
- Cracked and twisted roads and other damaged transport links.
- Death and injuries to individuals.
- Panic and shock of the people affected.

##### Secondary effects

- Fires caused by broken gas mains and electrical cables; fires develop due to the lack of water from broken pipes.
- Tidal waves or tsunamis often result from an earthquake such as the Boxing Day tsunami in 2004 or Japan 2011.
- Landslides in steep-sided valleys where the rocks are often weak.
- Shops and businesses destroyed.
- Tourists put off from visiting areas that had suffered eg Boxing Day tsunami.
- Damage to transport and communication links makes trade difficult.
- Disease and famine due to lack of clean water and medical facilities.
- Death caused by the cold of winter such as in the Kashmir earthquake of 2005.

#### Volcanic eruptions

Expect details of the event itself with data to support points.

Allow wide range of effects, eg

##### Primary effects

- The immediate impacts of volcanic gases and lava flows. Hot pyroclastic flows cause death by suffocation and burning.
- Tephra falls can cause the collapse of roofs and may destroy homes and farmland.

##### Secondary effects

- Lahars, landslides, and flooding. This may lead to food/water supply being interrupted.
- Disruption to travel.
- Homelessness.
- Businesses forced to close, and unemployment.
- Cost of insurance claims.
- Long-term economic issues eg with the tourism industry.
- Long-term impacts such as improved soils which may develop over time as the volcanic material is weathered.

AO1 = 3 marks, AO2 = 3 marks, AO3 = 3 marks

#### High performance

- Learners spell and punctuate with consistent accuracy
- Learners use rules of grammar with effective control of meaning overall
- Learners use a wide range of specialist terms as appropriate

### Student response A

**Chosen tectonic hazard: Earthquake**

A primary effect of the earthquake in Haiti is that thousands of people were killed. This is due to the fact that the country is an LEDC and so they cannot afford an improved infrastructure. This is more important than a secondary effect of the earthquake such as roads being blocked by rubble from collapsed buildings because people's lives have been lost and the economy will be widely affected as a result. Another primary effect of the Haiti earthquake that is more significant than secondary effects is that people have been made homeless. This is more significant than the amount of money the economy has lost because the people now have nowhere to live and as a result they are unable to pay rent and tax to the government.

### Examiner commentary A

There is some reference to the example of Haiti. Some effects are noted, such as deaths and homelessness, but the distinction between primary and secondary is not always clear or correct, as homelessness is given as primary. There is some drift in the first paragraph to cause which is not required in the question. An attempt is made to evaluate the significance but this is limited, piecemeal and simplistic. No reference is made to

Figure 5a – [2 marks – Level 1]

SPaG: spelling and punctuation is reasonably accurate, although sentences are long. A range of appropriate specialist terms are used [2 SPaG marks]

### Student response C

**Chosen tectonic hazard: Volcanic eruption**

Figure 5b shows a volcanic eruption and a powerful ash cloud it has released which is closing in on what appears to be an LEDC's town or village. The primary effects this will lead to are many people may be choked to death as well as much ash will cover the buildings and property, potentially harming vegetation that may be in the area. These primary effects take a higher significance in comparison to the secondary effects of this as people will be affected physically and so will their property whereas secondary effects will involve people needing to be relocated and expense being paid on things like new buildings or repairs. An example I have studied is the Montserrat soufriere hills volcanic eruption that resulted in multiple deaths and loads of vegetation and/or land being destroyed by this composite volcano as its lava/pyroclastic flow ran into the land below it. Figure 5b shows a composite volcano and the effects could be similar.

### Examiner commentary C

There is reference to both Figure 5b and an example – the Soufriere Hills volcano in Montserrat. The difference between primary and secondary effects is understood and there is some valid exemplification via the photograph and the case study regarding the impact of the ash on people and the environment. Some understanding is clear regarding the interrelationships between places, environments and processes in the context of a volcanic eruption. The evaluation in the middle of the answer reflects the content. Greater detail on the example and illustration of the primary and especially the secondary effects, together with a more informed and discursive evaluation, is needed to progress to the next level – [6 marks – Level 2]

SPaG: uses a range of specialist terms but punctuation is not always observed as proper names do not always have capitals, use of 'a' rather than 'the' with reference to the ash cloud in the first sentence and control of meaning overall being general rather than effective – [2 SPaG marks]

Add to response C:

[illegible]



## Question 2: The living world

2.2 Describe the distribution of hot deserts in Figure 6.

[2 marks]

### Mark scheme

Credit statements about distribution of hot deserts using information on the map, eg

- most of the world's hot deserts lie between 15° and 35° north and south of the equator (1)
- several deserts are found on the western side of continents, for example the deserts of South America and southern Africa (1)
- the largest desert (the Sahara) stretches across northern Africa into the Middle East (1)
- some hot deserts extend much closer to the equator, for instance the Atacama desert on the western side of South America (1).

No credit for simply listing continents or places where the deserts are found.

AO4 = 2 marks

#### Student response A

Hot deserts are found all over the globe. Places with hot deserts are USA, North Africa, Australia, South America.

#### Examiner commentary A

The first statement is not correct; the second is a list of locations. There is no reference to distribution – [0 marks]

#### Student response B

Most deserts are found in Africa and are mostly around the equator and the two tropics. An anomaly would be the desert in North America as it is entirely north of the Tropic of Cancer.

#### Examiner commentary B

There is an attempt to use the language of distribution – with regard to 'most deserts' and 'an anomaly' – but the content is only partially correct. Indicating that the desert in North America is an anomaly is valid – [1 mark]

#### Student response C

Hot deserts are mainly found around the tropics. The largest area of hot desert is in the north of Africa, the Sahara. These areas are mostly found on the west side of a continent.

#### Examiner commentary C

There is engagement with distribution in this answer. The first statement is too vague but the next two sentences establish valid points about distribution – [2 marks]

Your answer:

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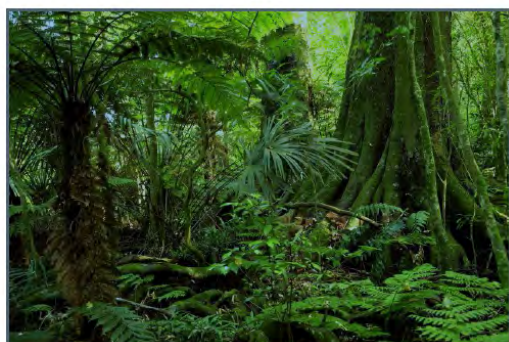
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Study Figure 7, a photograph showing part of the tropical rainforest in Central Africa.

Figure 7



Your answer:

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2.4 Describe and explain the features of the vegetation shown in **Figure 7**.

[6 marks]

**Mark scheme**

Level	Marks	Description
3 (Detailed)	5-6	AO3 Applies detailed knowledge of rainforest vegetation to interpret the features identified. AO3 Clearly relates characteristic(s) shown in the photograph to the climate of tropical rainforest environments.
2 (Clear)	3-4	AO1 Demonstrates accurate knowledge of the features of vegetation and climate to support the explanation. AO4 Makes clear and effective use of the photograph
1 (Basic)	1-2	AO1 Demonstrates limited knowledge of vegetation and climate in rainforest areas AO4 Makes limited use of the photograph
	0	No relevant content.

**Indicative content**

- Responses should include description and explanation. There should be clear evidence that the photograph has been used, eg the buttress roots of the trees, limited undergrowth, straight trunks. No credit for features not observed in the photograph.
- Due to the high rainfall, leaves often have drip tips which allow the water to be channelled to the end and fall so the leaf does not break. Leaf stems are also flexible to allow leaves to move with the sun.
- The bark on the trees is thin and smooth to allow free flow of water and because the high temperatures mean that there is no need for protection against cold.
- The waxy upper surface of the leaves protects against the heat.
- Some plants, such as lianas, climb up the trees to reach sunlight for photosynthesis, while others live on branches in the canopy for the same reason ie epiphytes.
- Buttress roots support the trees as they grow incredibly tall (over 50 m in some cases) as there is great competition for sunlight.
- Max level 1 for either description or explanation.

AO1 = 2 marks, AO3 = 2 marks, AO4 = 2 marks

**Student response A**

The large tree on the right has large roots for many reasons such as stability and to absorb a lot of nutrients from the soil. In addition the plants in the centre have large leaves, this is so that the raindrops will land on the leaves and flow down into the centre. Lastly, all the plants are closely packed together which results in the maximum amount of nutrients able to be absorbed is absorbed by all the plants.

**Examiner commentary A**

**There is some description of the photograph but the suggested reasons are not correct, other than mention of stability for trees with large roots– [2 marks – Level 1]**

**Student response B**

The large tree on the right of the picture has adapted into having thick, large roots to support its tall shape. It is tall so that it reaches over the forest canape to absorb the most sunlight. Also there are vines growing on the side of the large tree in order to absorb the tree's nutrients and uses it boldly for support.

**Examiner commentary B**

**There is some specific, clear description from the photograph and some accurate explanation, linking the feature of large roots to the reason of absorbing more sunlight – [4 marks – Level 2]**

2.7 Outline one possible environmental impact of deforestation.

[2 marks]

**Mark scheme**

Credit one impact only. Impact must be environmental, not economic or social.

One mark for stating an impact, eg

- forest habitats are destroyed (1)
- soil erosion increases as the tree cover is removed (1)
- burning the rainforest releases CO<sub>2</sub> (1).

Second mark for developing the point, eg

- forest habitats are destroyed leading to reduction and possible decimation of species (2)
- soil erosion increases as the tree cover is removed which can cause barren land, flooding and landslides (2)
- burning the rainforest releases CO<sub>2</sub> which contributes to world climate change (2).

AO2 = 2 marks

Student response A
<u>When cutting the trees, they decrease oxygen levels and release the carbon stored in the tree which contributes to the greenhouse gases.</u>
Examiner commentary A
Simple explanation but not fully developed [1 mark]

Student response B
<u>Lots of animals lose their homes and many animals and plants go extinct.</u>
Examiner commentary B
A simple impact relating to animals is noted without identifying the initial cause – [1 mark]

Student response C
<u>One environmental impact would be the number of animals in that area will reduce due to their habituate being destroyed, eg lemurs in Madagascar.</u>
Examiner commentary C
There is recognition of the loss of habitat and the subsequent impact on wildlife, with some exemplification – [2 marks]

Your answer:

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2.8 Suggest **one** way that international co-operation can help make tropical rainforests more sustainable.

[2 marks]

**Mark scheme**

Credit **one** way only. The answer must focus on the international implication of sustainable forest management and show understanding of a worldwide initiative.

One mark for stating the method, eg

- countries can be relieved of some of their debt, known as debt for nature schemes (1)
- international organisations such as the Forest Stewardship Council (FSC) promote sustainable forestry (1).

Second mark for a developed explanation, eg

- countries can be relieved of some of their debt, known as debt for nature schemes (1) in return for retaining their rainforest areas (2)
- international organisations such as the Forest Stewardship Council (FSC) promote sustainable forestry (1) by guaranteeing that timber products are sourced from sustainable managed forests (2).

AO2 = 2 marks

Your answer:

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**Student response A**

Instead of cutting down rainforest for cattle, they could make law so that cannot happen.

**Examiner commentary A**

There is no reference to the international aspect demanded by the question – [0 marks]

**Student response B**

Because many people use deforestation to get money, aid given to poor countries could reduce the need for this.

**Examiner commentary B**

There is a hint of an international context here but not enough to gain credit – [0 marks]



Answer **two** questions from the following:  
Question 3 (Coasts), Question 4 (Rivers), Question 5 (Glacial).

Question 03

Question 0 4 ○

Question 0 5

**CORRECT METHOD** ☒

## WRONG METHODS



Figure 11

[illegible]

Level	Marks	Description
2 (Clear)	3–4	AO2 Demonstrates clear understanding of how coastal defence(s) work in defending the coast. AO3 Application is sound with clear interpretation of the strategies shown in the photograph.
1 (Basic)	1–2	AO2 Shows limited understanding of how the coastal defence(s) work. AO3 Application is limited with basic interpretation of the strategy(ies) shown in the photograph.
	0	No relevant content.

- (Curved) sea walls reflect the energy of the waves back to the sea. They protect the base of cliffs, land and buildings against erosion and can prevent coastal flooding in some areas.
- Rock armour consists of large boulders piled up on the beach. These absorb the energy of waves and may allow the build-up of a beach.

AO2 = 2 marks, AO3 = 2 marks

The use of rock armour helps to protect the coastline because instead of the wall taking the force of the waves, the rocks take the force. This means that the amount of pressure on the cracks in the rock wall is reduced and it will take longer for the wall to erode.

One strategy shown in Figure 11 is identified. There is simple and partial understanding of how rock armour works as a sea defence – [2 marks – Level 1]

In the lower right hand corner of Figure 11, rock armour is shown along the coast, protecting the houses. Rock armour protects the coastline by absorbing the force of the waves crashing onto the coast and due to being a harder material than the coast, takes longer to erode and therefore is more resistant. This means that the erosion takes place on the rocks rather than the coastline.

There is specific reference to the position of the rock armour in Figure 11, with some understanding of the way in which the coast is protected. Only one type of sea defence is referred to so marks are capped at Level1 [2 marks – Level 1]

[6 marks]

Level	Marks	Description
3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown.  AO3 Makes full analysis of the resource, using evidence to support response.
2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of processes and landforms in depositional coastal environments.  AO2 Shows clear geographical understanding of the interrelationships between coastal environments and processes.
1 (Basic)	1-2	AO1 Demonstrates some knowledge of processes in depositional coastal environments. May be limited to an explanation of longshore drift and other processes only. Alternatively the account may be descriptive and be confined to landform appearance and structure.  AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes.
	0	No relevant content.

- Responses should analyse the map, finding connections and providing a logical chain of reasoning.
- The question implies knowledge of the processes of transportation and deposition as well as landform(s) of deposition. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.
- In the specification the relevant landforms are beaches, spits and bars, but credit other variations such as tombolos and barrier islands.
- The landforms are created by the process of longshore drift. Some eroded material is up caught up within the waves and is carried by the sea along the coastline. Material is carried along the shore in a zigzag fashion by waves as they swash material up the beach at an angle and backwash material down the beach at a right angle. The angle of swash is determined by the prevailing wind. On the map the direction is from west to east as shown by the prevailing wind, and the shape and growth of the spit.
- Credit processes of transportation such as traction, saltation and suspension.
- Allow labelled diagrams as part of the explanation of processes and landforms.
- Spits are formed by longshore drift in areas of relatively shallow and sheltered water where there is a change in the direction of the coastline. Deposition occurs, resulting in the accumulation of sand and shingle. The material initially deposited is the largest material, dropped due to the reduction in energy.

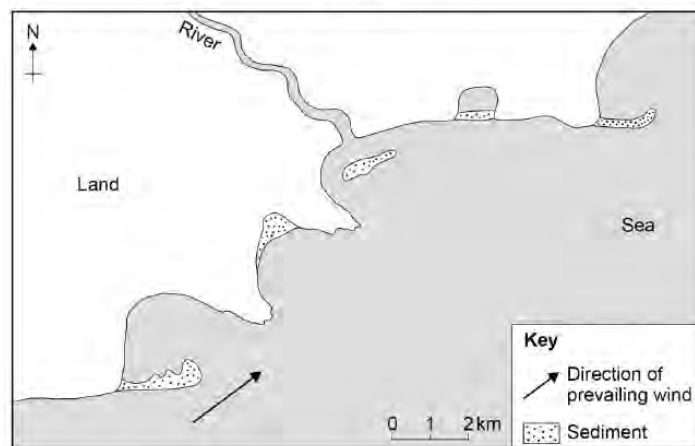
One landform that may be created by the transport and deposition of sediment along the coast is a spit. This happens as longshore drift transports sediment until it becomes blocked by a groyne. Without a groyne in place longshore drift takes place all the way down the beach and deposits the materials it is carrying at the end of the beach in the sea. Over time this deposition builds up to form a spit which then eventually turns into a bar.

Three landforms are mentioned: spit, bar and beach. The process of longshore drift is identified. However, the information is inaccurate and unclear; the groyne relates to a different aspect of coastal management and the 'end of the beach' is unclear. Thus, knowledge and understanding of processes and environments is limited –

[1 mark – Level 1]

In the left hand lower corner of Figure 12, a spit is being formed by the waves. This is created through the direction of the north east prevailing wind causing longshore drift to occur and deposition of sediment at sharp turns on the coast such as headlands means that a spit is formed. As this sediment builds up over time, the spit eventually meets another headland and creates a bar, where a lagoon is created behind it. Both of these landforms are the result of deposition. Another landform that can be created and is also pictured in the middle of Figure 12 is a beach. This is the result of a stronger swash depositing material and a weak backwash.

There is specific reference to Figure 12 at the start with regards to the spit. The process of longshore drift is linked to the prevailing wind (although the direction is incorrect and there is no link to the direction of longshore drift). There is brief reference to a bar and then a beach (with reference to the map) but the location is unclear for the beach, as only 'the middle of Figure 12' is stated. There is some explanation of the beach regarding formation in the context of the wave type. There is a need to relate to the resource and apply knowledge to it; for example, taking clues from the direction of the prevailing wind and the subsequent direction of longshore drift, with regards to the formation of the spit extending from the headland in the south western corner of the map. Bearing in mind the level descriptors, it is advisable to focus on two landforms in greater detail, rather than mentioning a number – [4 marks – Level 2]



- A bay bar may develop across the entrance to a bay and eventually join two headlands due to transport of sediment by longshore drift.
- Beaches are areas of sand, pebbles and shingle that are formed by deposition produced by wave processes and by longshore drift. Gently sloping beaches are formed by strong destructive waves that backwash more material away from the beach than they wash up the beach. Steeply sloping beaches are formed by constructive waves that wash more material up the beach than they backwash away, building up a steep beach gradient.

AO1 = 2 marks. AO2 = 2 marks. AO3 = 2 marks

Your answer:

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper appears to be a standard notebook page.

#### Question 4: River landscapes in the UK

4.3 Describe the shape of the river's long profile.

[1 mark]

##### Mark scheme

One mark for statements which show understanding of the gradient of the river, eg concave shape/steep in the upper course (1), gentler slope in lower course (1).

No credit for statements about the cross profile, eg steep banks at the beginning, flatter in the lower course.

AO4 = 1 mark

##### Student response A

It decreases in height as it gets further away from the source. Very gradual change.

##### Examiner commentary A

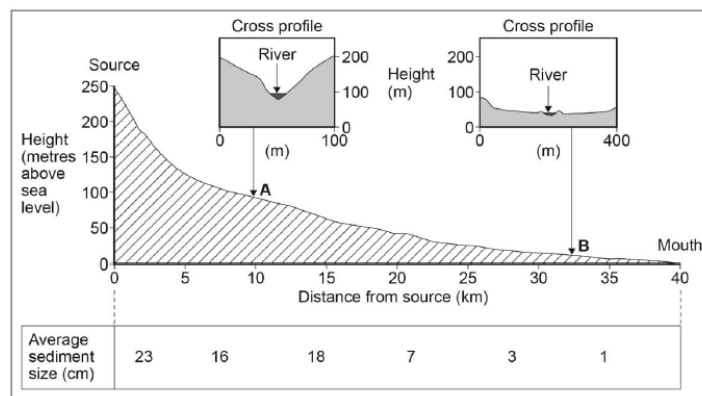
There is no reference to shape in this answer. Only height is described – [0 marks]

##### Student response B

The river has a steep and narrow upper course. However it begins to flatten out as it goes down.

##### Examiner commentary B

There is clear reference to the steepness in the upper course and the flatter nature lower down. The statement regarding 'narrow' is disregarded – [1 mark]



Your answer:

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4.4 Suggest **one** reason why the cross profile of the river valley changes between A and B.

[1 mark]

##### Mark scheme

Answers must suggest **one** reason for the decrease in slope angle of valley sides, based on an interpretation of the information provided, eg

- the valley sides become less steep because of the effects of mass wasting and weathering (1)
- near the source the river cuts downwards, but further downstream it is eroding laterally (1).

No credit for description of changes in valley profile between A and B.

AO3 = 1 mark

##### Student response A

The cross profile changes between valley A and B due to lateral and vertical erosion.

##### Examiner commentary A

Both types of erosion are given and no clear reason is conveyed – [0 marks]

##### Student response B

Because more lateral erosion happens at B.

##### Examiner commentary A

Explanation is clear here, with the greater role of lateral erosion noted at B – [1 mark]

Your answer:

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4.5 State **one** reason why the size of sediment carried by the river decreases downstream.

[1 mark]

##### Mark scheme

One mark for showing the general idea of attrition, eg

- particles in the river may collide with each other (attrition) (1)
- gradually become smaller in size (1).

No credit for answers that do not explain the mechanism, eg rocks break up.

AO1 = 1 mark

##### Student response A

Due to the velocity of the water changing meaning less sediment is carried downstream.

##### Examiner commentary A

This response looks at the amount of sediment, rather than its size, and is incorrect on reduction and reason – [0 marks]

##### Student response B

As the sediment travels further, more erosion such as attrition acts upon the sediment, leading to smaller sediment.

##### Examiner commentary B

This response is very clear, with recognition of the process of attrition – [1 mark]

Your answer:

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Study **Figure 15**, a photograph showing the effects of river flooding in Somerset in 2014.

## Figure 15

Level	Marks	Description
2 (Clear)	3–4	AO2 Shows clear understanding of how river flooding has economic effects.  AO3 Demonstrates application of knowledge and understanding make full interpretation of the photograph, suggesting likely economic effects in the area shown.
1 (Basic)	1–2	AO2 Shows limited understanding of how river flooding has economic effects.  AO3 Demonstrates application of knowledge and understanding to make limited interpretation of the photograph, suggesting possible economic effect(s) in the area shown.
	0	No relevant content.

## An aerial photograph showing a residential neighborhood completely inundated with floodwater. The water is a murky, brownish-grey color. Numerous houses with dark roofs are visible, some with water reaching their windows. Trees are mostly bare and stand in the water. A few cars are partially submerged. The flooding appears to be extensive, covering almost the entire visible area of the neighborhood.

- The focus of the question must be on the economic effects of river flooding. Direct interpretation of the photograph is required.
- Damage to property, which may be very costly to repair. High costs of temporary rehousing and additional travel.
- Decline in the local economy as businesses are unable to operate without power or road connections.
- Unemployment may increase if businesses are unable to fully recover from a flood.
- Disruption to agriculture as fields are flooded, crops submerged under water and livestock stranded or drowned.
- Communities are cut off from normal supplies-people are unable to travel to shops and services, or to reach work.
- Closure of roads may mean extensive detours for other traffic, which is expensive and time consuming.
- Huge cost of floods to insurers, resulting in rising premiums.

No credit for effects that cannot be reasonably deduced from the photograph, or for social and environmental effects, unless there is a related economic impact.

AO2 = 2 marks. AO3 = 2 marks

### Student response A

One economic effect is that the disposable income of local residents significantly decrease as they are not able to work or they have to pay for expensive repairs to their property. Also the local residents will not have lost many personal possessions or they were destroyed, leading to a poorer community.

## Examiner commentary A

There is limited reference to the photograph, but some valid implications are identified. The first part of the answer has an economic focus where some understanding is displayed. There is the drift into social effects, which could have been further developed to show their economic impacts.

[2 mark – Level 1]

### Student response B

The houses are completely flooded in Figure 15. This means the government will have to provide temporary housing for these people. Providing this will cost money as well as providing food and clothes. Additionally this will put a strain on insurance companies. They will have to pay to fix the house which would cost a lot of money.

## Examiner commentary B

There is an awareness that the buildings are houses and that they are flooded, as shown in the photograph. There is some understanding of the economic effects of this regarding the cost of providing temporary accommodation, repairs and the role of insurance companies. Further specific reference to the photograph looking at flooded fields as a different effect and further development of points relating to rising insurance premiums would lead to progress into Level 2 – [2 marks – Level 1]

### Student response C

The costs of repairs for roads and houses will be massive for residents and the council as the amount of debris will be large. One effect would be increased insurance premiums. Insurance companies would increase the price because it's more risky and a high chance they'll have to pay out. The floods will ruin farmers' crops and they will lose a lot of money as they have paid for the seeds and lost all their crops, causing the money they would receive from selling the crops to go.

## Examiner commentary C

The photograph is used to note impacts and to indicate economic effects relating to houses, infrastructure and farmland. There is a clear focus on explanation with regard to the amount of debris and the increased flood risk giving rise to higher insurance premiums – [4 marks – Level 2]

Your answer:



### Mark scheme

Level	Marks	Description
3 (Detailed)	5-6	AO3 Demonstrates thorough application of knowledge and understanding to analyse geographical information, giving detailed explanation of formation of the features shown  AO3 Makes full analysis of the resource, using evidence to support response.
2 (Clear)	3-4	AO1 Demonstrates specific and accurate knowledge of river processes and environments.  AO2 Shows thorough geographical understanding of the interrelationships between river environments and processes.
1 (Basic)	1-2	AO1 Demonstrates some knowledge of river processes and environments.  AO2 Shows limited geographical understanding of the interrelationships between environments and processes.
	0	No relevant content.

- Responses should analyse the photograph, finding connections and providing a logical chain of reasoning.
- The question implies knowledge of fluvial processes, and their interrelationship with the landform(s) created. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.
- Processes include the erosional processes of hydraulic action and abrasion or corrosion. Erosion is most rapid during powerful flood events. Credit transportation processes such as traction and saltation as well as processes of deposition as evidenced in the large debris to the right of the channel in the foreground. Mass movement processes may be relevant in the context of valley formation.
- A waterfall with plunge pool, and a steep sided valley or gorge is clearly visible. Credit reference to the more gently sided valley in the background, above the waterfall.
- Explanation will refer to geology where horizontal bands of hard and soft rock are crossed by the river as it flows down the long profile. The hard rock is on top – the cap rock. This leads to differential erosion as the underlying soft rock is eroded faster than the overlying hard rock via abrasion and hydraulic action. Over time, the soft rock is gouged out to leave an overhang as the profile is steepened. This will be unable to support its weight and will collapse into the plunge pool providing further material for erosion and the deepening of the waterfall. Over many centuries, the waterfall may retreat to form a gorge of recession.

AO1 = 2 marks, AO2 = 2 marks, AO3 = 2 marks

There are layers of soft and hard rock. The soft rock below the hard rock is easily eroded creating a slip of slope. The water then has a slope to run down and over time erodes the soft rock further. The slope steepens and then creates a vertical drop and a plunge pool for the water to land in. The erosion is lateral erosion and erodes at a fast rate.

There is some recognition of the start of the sequence, with regard to the positioning of bands of hard and soft rock, but the terminology – such as slip off slope – is incorrect and the sequence becomes unclear. Thus, understanding and knowledge are limited – [2 marks – Level 1]

One landform shown in Figure 16 is the waterfall to the left of the photo. This is formed through the erosion of hard rock and soft rock through hydraulic action and attrition. The force of the water erodes the soft layer of rock underneath the layer of hard rock, which creates an overhang. As the overhang gets bigger as a result of hydraulic action, the rock that has broken off is deposited at the bottom of the waterfall in the plunge pool. Eventually, the overhang becomes too heavy and it collapses and is deposited into the plunge pool, as the rocks are usually too large to be carried away by the force of the water.

There is specific knowledge of the processes involved in the formation of waterfalls, such as erosion and specifically hydraulic action. There is knowledge of the arrangement of the rocks and the impact of this, with some specific reference to the photograph. To progress further, there needs to be greater use and analysis of the photograph, applying knowledge of river environments to the landscape and explaining the formation of both waterfall and gorge in terms of sequence and process – [4 marks – Level 2]

Study Figure 16, a photograph showing the waterfall at High Force on the River Tees.

A scenic view of a waterfall cascading over a rocky ledge into a pool of water, surrounded by dense green forest and hills in the background.

In the photo, there is a waterfall, plunge pool and gorge. The layers of hard and soft rock can be seen in the picture. The waterfall is formed by the soft rock being eroded away underneath the hard rock. This is then undercut by the water. The hard rock eventually forms an overhang due to the undercutting and so it collapses and falls into the plunge pool, which is formed by being vertically eroded by the water. This process is repeated which makes the waterfall retreat forming the gorge. The river flows through the gorge shown in the picture.

There is clear reference to the photograph as two landforms are identified and the plunge pool is recognised. There is recognition of the two different rock types visible in the photograph (although it is not stated what the evidence is – which would be a Level 3 response) and the gorge in the foreground is referred to. Explanation notes the alignment of rocks and notes some processes for the top of Level 2 but not in the detail required for Level 3; for example, by looking at the role of hydraulic action or abrasion in forming the plunge pool and causing headward erosion – [4 marks – Level 2]

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.