A-level
GEOGRAPHY
7037/1

Paper 1 Physical Geography

Mark scheme

June 2021

Version: 1.0 Final Mark Scheme

2 1 6 A 7 0 3 7 / 1 / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from aqa.org.uk

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the typical performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

The notes for answers provide indicative content. Students' responses may take a different approach in relation to that which is typical or expected. It is important to stress that examiners must consider all a student's work and the extent to which this answered the question, irrespective of whether a response follows an expected structure. If in doubt the examiner should contact their team leader for advice and guidance.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Section A

Question 1 Water and carbon cycles

Qu	Part	Marking guidance	Total marks
01	1	**Outline the relationship between the water cycle and the carbon cycle in the atmosphere.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Notes for answers • Increasing concentrations of carbon (and Methane) in the atmosphere has a warming effect on the planet and leads to increased evaporation (1). This can increase rates of precipitation or equally higher rates of evaporation can further exacerbate aridity (1) (d). • Volcanic eruptions release both carbon dioxide and water vapour into the atmosphere (1). • Photosynthesis requires both precipitation and carbon dioxide (1). • Decomposition releases carbon dioxide and requires the presence of water (1). Some may link this to the melting of permafrost, which is a significant contributor to CO_2 release (1) (d). • Some may consider the acid rain as an outcome of the relationship between water and carbon on the atmosphere (1). This may be further linked to ocean acidification (1) (d). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
01	2	**Analyse the data shown in Figure 1.** **AO3** – There should be clear analysis of the relationships evident in the resource. Analysis should consider the relationship between forest cover, land surface temperature and latitude. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence.	**6** **AO3=6**

		Notes for answers **AO3** • Afforestation is more likely to lead to a reduction in land surface temperature. The most extreme temperature decreases can be seen where temperatures fall by up to 1.7°C at latitudes -25°S and a reduction in 50–70% surface cover. • Some obvious anomalies exist eg at 5°S, 10%–30% afforestation appears to lead to a small temperature increase. Similarly at around 40°s, up to 50% afforestation leads to temperature decrease but at 60% afforestation, temperatures appear to increase. The highest latitudes also tend to see temperature increases with afforestation, more so in the northern hemisphere, though here data extends to 75°N, compared to only 55°S. • The pattern is arguably less predictable for deforestation. As a generalisation increasing deforestation leads to higher land surface temperatures with figures up to 1.7°C noted between 15°N and 15°S. • Between 55 and 75°N, almost any deforestation leads to temperature decrease and at around 45°N, with 70% decrease in forest, there is a significant drop in land surface temperature. • Some may note the lack of data particularly between 25°N and 15°S. This does make it more difficult to identify patterns within the data at these latitudes and also makes it more difficult to compare latitudes. • Some may consider deforestation in isolation and look for variation in patterns here. This is creditworthy at Level 1. Credit any other valid analysis.	

01	3	**Using Figure 2 and your own knowledge, assess the implications of the data for attempts to manage carbon transfers.** **AO1** – Knowledge and understanding of the carbon cycle. **AO2** – Application of knowledge to show how effective understanding and managing carbon transfers can impact upon carbon storage. Mark scheme **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change.	**6** **AO1=2** **AO2=4**

		AO2 – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance. <u>Notes for answers</u> **AO1** • Global distribution, and size of major stores of carbon – lithosphere, hydrosphere, cryosphere, biosphere, atmosphere. • Factors driving change in the magnitude of these stores over time and space, including flows and transfers at plant, sere and continental scales. Photosynthesis, respiration, decomposition, combustion, carbon sequestration in oceans and sediments, weathering. Changes in the carbon cycle over time, to include natural variation (including wild fires, volcanic activity) and human impact (including hydrocarbon fuel extraction and burning, farming practices, deforestation, land use changes). • The carbon budget and the impact of the carbon cycle upon land, ocean and atmosphere, including global climate. • Human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change. **AO2** • Responses should note that any management should seek to control the release of carbon from forests into the atmosphere as well as increase the uptake of carbon by expanding forests and increasing rates of photosynthesis. • The data suggests that European forests absorb more carbon than is released. It also suggests that more could be done to help with the absorption of carbon especially considering the amount that is released through burning fossil fuels. Fires release 7 TgC. A strategy to reduce wildfire could help reduce the amount released by uncontrolled burning or wildfire. • Similarly better use of waste from wood products could reduce decomposition and the burning of this could reduce fossil fuel use. In this sense some may argue that burning wood as a fuel source is carbon neutral as only a small amount is stored following decomposition. The wood burning for fuel could reduce emissions from burning fossil fuels ie an indirect benefit. • Some may suggest that afforestation schemes may reduce the rainsplash impact and soil erosion. This could reduce the 15 TgC lost in river carbon flow. • Making better use of wood in construction could reduce the reliance on energy intensive products. In this sense the forest could reduce carbon emissions more indirectly. • Some may consider sequestration as method to control the carbon released through decomposition. Credit any other valid assessment.	

01	4	**With reference to a river catchment that you have studied, assess the potential factors which can impact upon the flood hydrograph.** **AO1** – Knowledge and understanding of the flood hydrograph and factors affecting the shape of it. K/U of a chosen case study of a river catchment. **AO2** – Application of knowledge and understanding assess the impact of environmental factors, development and / or conservation on the hydrograph. <u>Notes for answers</u> **AO1** • Drainage basins as open systems – inputs and outputs, to include precipitation, evapo-transpiration and runoff; stores and flows, to include interception, surface, soil water, groundwater and channel storage; stemflow, infiltration overland flow, and channel flow. Concept of water balance. • Runoff variation and the flood hydrograph. • Changes in the water cycle over time to include natural variation including storm events, seasonal changes and human impact including farming practices, land use change and water abstraction. • Case study of a river catchment(s) at a local scale to illustrate and analyse the key themes above, engage with field data and consider the impact of precipitation upon drainage basin stores and transfers and implications for flooding. **AO2** • Responses are expected apply their knowledge of factors affecting the flood hydrograph to their chose case study of a river catchment. • Land use and other human activities influence the peak discharge of floods by modifying how rainfall is stored on and run off the land surface into streams. In undeveloped areas such as forests and grasslands, rainfall and snowmelt collect and are stored on vegetation, in the soil, or in surface depressions. When this storage capacity is filled, runoff flows slowly through soil, this reducing the flashiness of the hydrograph. • In contrast, urban areas, where much of the land surface is covered by roads and buildings, have less capacity to store rainfall and snowmelt. Construction of roads and buildings often involves removing vegetation, soil, and depressions from the land surface. The permeable soil is replaced by impermeable surfaces such as roads, roofs, concrete and tarmac surfaces, store little water, reduce infiltration of water into the ground, and accelerate runoff to ditches and streams. Even in suburban areas, where lawns and other permeable landscaping may be common, rainfall and snowmelt can saturate thin soils and produce overland flow, which runs off quickly. Once water enters a drainage network, it flows faster than either overland or subsurface flow. • Expect to see reference to specific case study detail eg Streamflow in Mercer Creek, an urban stream in western Washington, increases	**20** **AO1=10** **AO2=10**

		more quickly, reaches a higher peak discharge, and has a larger volume during a one-day storm on 1 February 2000, than streamflow in Newaukum Creek, a nearby rural stream. Streamflow during the following week, however, was greater in Newaukum Creek. Lag time was shorter and the peak was significantly higher Mercer Creak. The return to normal base flow was longer on Newaukum Creek. With less storage capacity for water in urban basins and more rapid runoff, urban streams rise more quickly during storms and have higher peak discharge rates than do rural streams. In addition, the total volume of water discharged during a flood tends to be larger for urban streams than for rural streams. For example, streamflow in Mercer Creek, an urban stream in western Washington, increases earlier and more rapidly, has a higher peak discharge and volume during the storm on 1 February 2000, and decreases more rapidly than in Newaukum Creek, a nearby rural stream. • As with any comparison between streams, the differences in streamflow cannot be attributed solely to land use, but may also reflect differences in geology, topography, basin size and shape, and storm patterns. Expect to see responses consider natural factors such as these when considering impacts on the storm hydrograph. • Other responses may consider the impact of conservation on the storm hydrograph. In simple terms, expect to see the opposite impact ie that conservation flattens the peak and lengthens the lag to peak discharge. In other words the one of the key benefits of afforestation on the drainage basin is that it can dramatically reduce the likelihood of flooding downstream. • For example, the Pickering Project in North Yorkshire was one of three natural flood management trials set up after the severe floods of 2007. Another was at Holnicote in Somerset and a report by the Moors for the Future Partnership for the Environment Agency in February estimated this could reduce peak river flow by 25%. The third project, in Derbyshire, was estimated to be able to reduce peak flows by 4% • Tree planting can make a big contribution to reducing flood risk and should be part of a wider flood risk management approach, including conventional flood defences. Credit any other valid approach.	

Marking grid for Question 01.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

	• Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places. • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question. Interpretation is basic (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies. (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Section B

Question 2 Hot desert systems and landscapes

Qu	Part	Marking guidance	Total marks
02	1	**Outline the role of wind in the process of transport in hot deserts.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Notes for answers • Traction or creep occurs when sediments are blown along the floor in deserts(1). • Saltation refers to the bouncing movement of sediments (1), usually in stronger winds and involving smaller particles than those which are associated with creep (1) (d). • Suspended particles are the smallest and, in the strongest wind these particles remain airborne (1). Dust storms are an example of the manifestation of suspended particles in strong winds (1) (d). • Transport of sediments by wind or aeolian processes are responsible for major erosion in deserts (1). Max 2 for the link to erosion. The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
02	2	**Analyse the data shown in Figure 3a and Figure 3b.** **AO3** – Responses should use the two resource effectively and appropriately showing understanding of the map and data as well as the complexity of potential inter-relationships. Expect to see analysis of patterns and identification of potential anomalies. There should be use of data manipulation in support. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided, which makes appropriate use of evidence in support. Clear connection(s) between different aspects of the evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided, which makes limited use of evidence in support. Basic connection(s) between different aspects of the evidence.	**6** **AO3=6**

		Notes for answers **AO3** • The data shows significant variation both within Saudi Arabia but also across the wet and dry season in the same places. • The data covers much of Saudi Arabia but with more recording around the land and sea borders and nothing in Rub Al Khali. • In the wet season, rainfall varies from up to 250 mm in the south west and down to 40–60 mm in the north. This produces a range of up to 210 mm. In the wet season there are limited obvious patterns ie north-south and east-west trends are not apparent. Instead there appears to be pockets of wetter and drier places eg a cluster to the northwest were rainfall only reaches 20–40mm per year. • The dry season is generally, though not always drier. For instance, in the southwest on the border with Yemen and the Red Sea, there is evidence in at least two places where rainfall is in the same band (60–80mm and 100–150mm) across the wet and dry seasons. • Generally, rainfall either disappears or is negligible across most of the central northern and north western regions. The biggest variation is from 0–10mm up to 100–150mm between the two seasons, near to the border with Iraq; a difference of up to 140 mm across the seasons. Credit any other valid analysis.	

02	3	**Using Figure 4 and your own knowledge, assess the relative importance of factors leading to the development of this landscape.** **AO1** – Knowledge and understanding of the factors leading to the formation of formation of barchan dunes. **AO2** – Application of knowledge and understanding to show understanding of the relative importance factors that have contributed to the development of this landscape. Mark scheme **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the	**6** **AO1=2** **AO2=4**

		context provided. Connections and relationships between different aspects of study are basic with limited relevance. <u>Notes for answers</u> **AO1** • Sources of energy in hot desert environments: insolation, winds, runoff. • Sediment sources, cells and budgets. • Geomorphological processes: weathering, mass movement, erosion, transportation and deposition. • The role of wind – erosion: deflation and abrasion; transportation; suspension, saltation, surface creep, deposition. • Origin and development of landforms of mid and low latitude deserts: Barchans. **AO2** • Responses should note that these are barchans. • The major factors in the development are these dunes are: • A ready supply of available sediments ie fine and coarse sand in this case; • A prevailing regular and consistent wind direction, in this case from northwest to southeast; • A smooth flat surface over which the wind can blow the sand, but also some subtle changes in the shape of the land so that sediments collect. • In terms of relative importance, having first identified factors, responses should show awareness of the importance of factors. The three factors work in conjunction with each other. Some may suggest that without a supply of sand from the Orange River, the barchans could not form. Equally though a less reliable and consistent wind direction would relatively quickly alter the shape of the dunes. The flat surface allows the sand to move and clear evidence that sand has been completely removed from most places on the north west side of each dune. Without such flat surfaces the sand could not move so freely and the barchans could not establish such a recognisable shape. • Some may therefore argue against the idea of relative importance and instead suggest that it is the inter-relationship between three equal factors which has shaped the barchans. Generic explanation of the formation of barchans (with no attempt to apply knowledge to the image and associated information) should be held to Level 1. Credit any other valid assessment.	

02	4	**To what extent can an understanding of feedback systems help to reduce the problem of desertification?** **AO1** • Knowledge and understanding of systems operating in desert landscapes. Awareness of factors leading to the process of desertification. **AO2** • Application of knowledge and understanding to assess the extent to understanding of feedback systems can reverse desertification. <u>Notes for answers</u> **AO1** • Systems in physical geography: systems concepts and their application to the development of desert landscapes – inputs, outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium. The concepts of landform and landscape and how related landforms combine to form characteristic landscapes. • The global distribution of mid and low latitude deserts and their margins (arid and semi-arid). • Characteristics of hot desert environments and their margins: climate, soils and vegetation (and their interaction). Water balance and aridity index. • The causes of aridity: atmospheric processes relating to pressure, winds, continentality, relief and cold ocean currents. • The changing extent and distribution of hot deserts over the last 10 000 years. The causes of desertification – climate change and human impact; distribution of areas at risk; impact on ecosystems, landscapes and populations. • Case study at a local scale of a landscape where desertification has occurred to illustrate and analyse key themes of desertification, causes and impacts, implications for sustainable development. Evaluation of human responses of resilience, mitigation and adaptation. **AO2** • Responses should recognise that understanding feedback loops critically important in addressing the issue of desertification. Understanding the desert system is a fundamental requirement of this question. • Positive feedback leads to exacerbation of desertification in the context. • Some may consider positive feedback in the context of natural changes in a region. Desertification can be a natural phenomena whereby one change in the input can have a knock on effect to the rest of the system moving it away from the existing equilibrium. For example reduced rainfall as a result of localised or regional climate change (caused by natural climate cycles such as the Atlantic Multidecadal Oscillation) can cause a chain reaction of subsequent impacts. The loss of vegetation cover will further disruption	**20** **AO1=10** **AO2=10**

		convectional processes and increase the albedo. The lack of vegetation can also reduce the soil moisture content and increase loss through drainage. The region will become drier and deserts will expand. • Expect to see reference to the expansion and contraction of arid and semi arid regions which is a natural phenomena over thousands of years. The Sahara has been expanding and contracting in the way for millennia. • Understanding the cause of these cycles as well as their impacts is vital in helping to reduce incidence of desertification. • It is the loss of vegetation cover which also leads to further positive feedback. This is because the soils are more easily eroded and are no longer replenished with biomass. Infertile soils can them no longer sustain the plant life even if precipitation increases. • It is this understanding of feedback which is helping to address the human induced desertification processes. Human activities such as overgrazing, deforestation, intensive agriculture, as well as exceeding the carrying capacity of a region through overpopulation, are all leading to positive feedback and the continued expansion of deserts. • Recent research suggests that the Sahara as increased in size by 70% over the last 70 years as a direct result of positive feedback caused by these human activities. • By understanding these impacts action can be taken to restore the balance. Expect responses to refer to negative feedback in this context. Case studies are also likely to feature. • In Burkina Faso, between 1989 and 2004 some 200 000 to 300 000 hectares (ha) of once degraded land was reclaimed through the adoption of innovative techniques based on traditional farming practices, eg. o Planting pits traditionally used on a small scale to rehabilitate hard, barren land. Innovations included widening the dimensions of the pits and the application of manure and other organic waste. o Contour stone bunds: semi-permeable barriers built by placing stones tightly together around and within fields. They trap rainwater and encourage its slow absorption into the soil, preventing runoff and reducing erosion by trapping soil particles and increasing soil moisture. o Demi-lunes: ditches dug in a semi-circular shape and lined with cuttings. The hollowed portion collects water along its walls allowing crops planted in the ditch to receive much more rain. Like contour bunds, these follow the contour of slopes across fields to retain run-off. • These examples show how degraded land can be restored but it also shows how reversing the positive feedback is a challenge and really requires small scale action whilst contributing to wider aims for the overall sustainability of the region. Any conclusion is acceptable, though should relate to preceding content.	

Marking grid for Question 02.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places. • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question. Interpretation is basic (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

	• Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies. (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Question 3 Coastal systems and landscapes

Qu	Part	Marking guidance	Total marks
03	1	**Outline the role of waves in the transportation of sediments at the coast.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Notes for answers • Constructive waves tend to bring sediments on to the beach (1). This is due to the low energy nature of these wave (1) (d). They tend to have low frequency, height and limited backwash (1) (d). The swash is therefore a key factor in bringing sediments onshore (1) (d). • Destructive waves tend to remove sediments from beaches and coastlines (1). They have a powerful backwash, higher frequency and greater wave height(1) (d). The backwash is instrumental in transporting material back out to sea, sometimes deposited at an offshore bar (1) (d). • Longshore drift is the gradual movement of sediments along a coastline (1) (d). Where waves strike the coast at an angle, sediments are moved up the beach at that same angle with the swash (1) (d). The backwash returns sea water and sediments perpendicular to the coastline (1) (d). Repeated wave action in this way moves sediments along parallel to the coastline (1) (d). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
03	2	**Analyse the data shown in Figure 5.** **AO3** – Analysis of the map evidence to identify patterns, anomalies and using data manipulation to support response. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided, which makes appropriate use of evidence in support. Clear connection(s) between different aspects of the evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided, which makes limited use of evidence in support. Basic connection(s) between different aspects of the evidence.	**6** **AO3=6**

		Notes for answers **AO3** • The overall picture is very mixed across the European coastlines. • There are large areas experiencing accretion, particularly around northern Europe. • The picture around the Jutland peninsula is hard to decipher and somewhat unclear. Expect candidates to question the clarity of the resource in this area. The picture is mixed here with what looks like more accretion than erosion. • Some may suggest that more exposed coastlines are eroding, but this pattern is far from certain. There is some evidence in support in places such as the west coast of the Ireland and Portugal. • The Mediterranean coastlines are almost all either eroding or stable with only small pockets of accretion such as in northern Italy. • It is interesting to note that the islands of Madeira and the Canaries are both exposed coastlines but experiencing stability. Credit any other valid analysis.	

03	3	**Using Figure 6 and your own knowledge, assess the relative importance of factors leading to the development of this landform.** **AO1** – Knowledge and understanding of the processes related to the development of spits. **AO2** – Application of this knowledge to the novel situation; specifically, in accounting for relative importance of factors leading to the development of spits. Mark scheme **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. **AO2** – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance. Notes for answers **AO1**	**6** **AO1=2** **AO2=4**

		• Systems in physical geography: systems concepts and their application to the development of desert landscapes – inputs, outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium. • Origin and development of landforms and landscapes of coastal deposition. Beaches, simple and compound spits. • Estuarine mudflat/saltmarsh environments and associated landscapes; factors and processes in their development. • Geomorphological processes: weathering, erosion, transportation and deposition. • Distinctively coastal processes: marine: transportation: traction, suspension (longshore/littoral drift) and deposition; **AO2** • Several factors lead to the development of spits such as the one shown in the photograph, Spurn Head spit. • There has to be already supply of sediment, in this case provided by the boulder clay of the Holderness coastline. Longshore drift works in conjunction with a changing direction of coastline to continue to push sediment into the Humber estuary. • The recurved head has been formed as a result of wave refraction. • The area behind the spit appears to be shallow water and some may argue that this is an inter-tidal mudflat, sheltered from the sea's most powerful energy by the spit itself. • In terms of relative importance, it is more a combination of factors which come together create this landscape, though the supply of sediment and longshore drift might feature as being most important. Credit any other valid assessment. Generic explanation of the formation of spits (with no attempt to apply knowledge to the resource and associated information) should be held to Level 1.	

03	4	**To what extent can an understanding of feedback systems help with the management of one or more coastal landscapes that you have studied?** **AO1** – Knowledge and understanding of systems operating in coastal landscapes. Awareness of coastal management strategies. **AO2** – Application of knowledge and understanding to assess the extent to understanding of feedback systems can be utilised in helping to combat erosion flooding as well as to protect habitats. <u>Notes for answers</u> **AO1** • Systems in physical geography: systems concepts and their application to the development of coastal landscapes – inputs, outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium. The concepts of landform and landscape and how related landforms combine to form characteristic landscapes. • Human intervention in coastal landscapes. Traditional approaches to coastal flood and erosion risk: hard and soft engineering. Sustainable approaches to coastal flood risk and coastal erosion management: shoreline management/integrated coastal zone management. • Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes and challenges represented in their sustainable management. • Case study of a contrasting coastal landscape beyond the UK to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation. **AO2** • Expect to see responses set out a clear understanding of the concept of positive and negative feedback in coastal systems. • At the coastline there are many examples of both positive and negative feedback. The coastal management philosophy aims to respond to change in the system by aiming to restore natural balance at the coastline. Coastal management therefore seeks to exploit the concept and application of naturally occurring negative feedback in the coastal system. Management also seeks to counteract the exacerbating and damaging impact of positive feedback which takes the system further and further away from equilibrium. • Expect to see a combination of place based case studies and / or exemplification through evaluation of shoreline management / integrated coastal zone management plans. • For example, Holderness is already one of the fastest eroding coastlines in the world, receding by up to 2 metres per year. Sea level change threatens to further exacerbate this by create a positive feedback loop. As sea levels are predicted to rise this will further erode coastlines. This combined with naturally occurring processes such as longshore drift will expose the coastline to even further erosion. Without intervention stability will only be created when the	**20** **AO1=10** **AO2=10**

		boulder clay has been removed completely, with more resistant chalk lying further inland. Clearly this would be intolerable to local communities but also economically. As a result, substantial coastal management has been employed to restore equilibrium eg by installing sea walls, rip rap and groynes to resist erosion and create artificial beaches. • In terms of integrated coastal zone management schemes, the key underpinning philosophy is one of bringing all relevant stakeholders together to consider a sustainable future for the coastal which responds to change, always seeking to restore balance. One example is the Pegaso Project, an Integrated coastal management strategy in the Mediterranean. Reports have highlighted numerous examples of entire coastlines that have experienced exceptionally high waves, severe floods, or large shoreline erosions among other natural coastal impacts, all examples of potential positive feedback. Floods for example, accounted for 35% of all natural disasters that hit the Mediterranean. Italy and Romania are among the countries that had experienced an increasing number of severe floods. Besides the possible effects of climate change, growing uncontrolled coastal urbanisation, and construction of coastal infrastructures, land use changes and deforestation are the main reasons creating higher sensitivity on the part of coastal zones to these events. The purpose of the ICZM in this context is to address the underlying positive feedback and return the coast to a more stable equilibrium in a sustainable fashion for all stakeholders. • In summary, whatever the context, expect most responses to agree that understanding feedback is essential to sustainable coastal management. Credit any other valid approach. Evaluation should be based upon preceding content.	

Marking grid for Question 03.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places. • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question. Interpretation is basic (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies. (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Question 4 Glacial systems and landscapes

Qu	Part	Marking guidance	Total marks
04	1	**Outline processes by which glaciers erode the landscape.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Point marked **AO1** • Plucking occurs when subglacial water freezes against rock (1). As the glacial ice move under the force of gravity pieces of rock are plucked out of the ground (1) (d). This material is sometimes described as being a tool for abrasion as it partially forms the basis of that process (1) (d). • Abrasion happens when ice and rock debris scrape and scour the landscape under the glacier (1). As the ice moves coarse debris can scratch the rock leave large striations in the bedrock (1) (d). Finer debris in the rock can then also leave smooth and polished surfaces (1) (d). The debris itself can also be worn down to fine particles referred to as rock flour (1) (d). Max 3 if only one process is considered. The Notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
04	2	**Analyse the data shown in Figure 7.** **AO3** – Responses should use the resource effectively and appropriately showing understanding of the complexity of the data. There should be an understanding of the patterns and identification of potential anomalies. There should be some data manipulation in support. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis and interpretation of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis and interpretation of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence. Notes for answers	**6** **AO3=6**

		AO3 • Most of the ice on the land is moving. • There is a very large variation in surface velocities across the region. This evidenced by the necessity for a logarithmic scale. • There is a strong correlation between proximity to coast and speed of ice. As distance from the coast increases, the surface glacier speed decreases. Inland the glaciers are barely moving at just around 2–3 metres per year. • Most of the glaciers are experiencing their fastest flows beyond the grounding line. The exception is Pine Island where there is a flow of up to 1000 metres per year up to 100km inland. • Some may link the increased speed to latitude ie the faster speeds are at the relatively lower latitudes. • Some may suggest that the 'fingers' of higher velocity are almost certainly correlated with the valley glaciers. • Some may link the surface velocity speed to relief. Whilst there are no figures, the map does give some indications of relief. This is a reasonable conclusion to draw. • Some may consider the juxtaposition of very high rates and relatively low rates of velocity, eg the bay area around Haynes, Pope, Smith and Kohler have a figures around 100m per year velocity and up to 700 metres per year with the division occurring at the grounding line. • There may be some evaluation of the resource eg that the colour scheme actually makes the ice look like land. Credit any other valid analysis.	

04	3	**Using Figure 8 and your own knowledge, assess the relative importance of factors leading to the development of this landscape.** **AO1** – Knowledge and understanding of the development of thermokarst. **AO2** – Applies knowledge and understanding to the context of the question in accounting for the development of this landscape. <u>Mark scheme</u> **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies knowledge and understanding to this novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance. **Level 1 (1–3 marks)**	**6** **AO1=2** **AO2=4**

		AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. **AO2** – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance. <u>Notes for answers</u> **AO1** • The global distribution of past and present periglacial environments. • Periglacial features and processes: permafrost, active layer and mass movement. • Periglacial landforms: thermokarst. Characteristic periglacial landscapes. **AO2** • Responses should show awareness that this is thermokarst. Some may consider ice wedge polygons or stone polygons, but there is a clear clue in the note as to what the feature is. • Expect to see knowledge of formation ie that the melting permafrost creates a depression in the land which is filled by the water evident in the image. • Some may suggest that with further warming of the planet these areas are set to extent further north and the localised scale may also increase. • In terms of relative importance the melting ice is almost certainly the most significant factor, though some may consider other factors such as aspect, relief, soil type and geology, all significant factors in the development of this landscape. • For example, there must be variety of factors at play as the ice is at various stages of melting. Ice on north facing slopes is likely to melt more slowly than ice on south facing slopes. Similarly, the proximity of the permafrost to the surface of the ground is also likely to contribute to the scale and extent of melting. Credit any other valid assessment. Generic explanation of thermokarst (with no attempt to apply knowledge to the image) should be held to Level 1.	

04	4	**To what extent can an understanding of feedback systems help with the management of one or more cold environments that you have studied?** **AO1** – Knowledge and understanding of the systems approach to cold environments. Knowledge and understanding of the management of cold environments. **AO2** – Applies knowledge and understanding to the context of the question in assessing the role of management in restoring equilibrium to cold environments. <u>Notes for answers</u> **AO1** • Systems in physical geography: systems concepts and their application to the development of glaciated landscapes – inputs, outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium. The concepts of landform and landscape and how related landforms combine to form characteristic landscapes. • Concept of environmental fragility. Human impacts on fragile cold environments over time and at a variety of scales. Recent and prospective impact of climate change. Management of cold environments at present and in alternative possible futures. • Case study of a contrasting glaciated landscape to illustrate and analyse how it presents challenges and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation. **AO2** • Expect to see some definitions and understanding of feedback in this context. Feedback refers to a change in the system which is then: either exacerbated to take the system further away from equilibrium; or is counteracted to return the system back to equilibrium. • Most are likely to consider the impact of climate change and its potential to cause positive feedback, further destabilising the cold environments' fragile system and dynamic equilibrium. • A warming planet will lead to more ice melting in cold environments. This in turn will lead to a lower albedo effect in places with continental ice or upland glaciated landscapes. With less reflectivity in water compared to snow, more of the sun's radiation will be absorbed thus exacerbating the warming. • Similarly more melting of permafrost in periglacial areas (such as northern Russia, Canada or the American state of Alaska), is known to cause the release of methane through the decay of previously frozen soils. Methane is a powerful greenhouse gas, up to twenty times more effective than carbon dioxide at trapping in the sun's heat. With more warming comes even more melting and the cycle is taken even further away from equilibrium. • Both of these are examples of positive feedback.	**20** **AO1=10** **AO2=10**

		• Some may note the counterbalancing impact of negative feedback. For instance, as ice covered areas recede, vegetation can recolonise. This increased photosynthesis will take carbon out of the atmosphere restoring the balance. • In terms of management, responses are likely to consider a range of scales. Global agreements on reducing carbon emission are likely to feature (Paris, Rio, Kyoto etc) as attempts to reduce positive feedback. • Similarly expect to see more localised measures eg use of artificial snow at ski resorts can increase albedo and therefore acts restore the balance, albeit on a small scale. Similarly, tree planting schemes in places such as Taiga of Siberia can act to reduce atmospheric carbon and again support the planned benefit of reducing global temperatures. There should be some explicit assessment in the context of the question. Credit any other valid assessment.	

Marking grid for Question 4.4

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts and processes throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Section C

Question 5 Hazards

Qu	Part	Marking guidance	Total marks
05	1	**Outline the concept of the Hazard Management Cycle.** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Point marked **AO1** • The hazard management cycle is continuous loop which explains an approach to managing a known hazard (1). • Preparedness is concerned with using evidence and data from previous events to plan for hazards associated with the event.(1) Good preparation is the key to minimising impact upon the population (1) (d). • Response is concerned with deploying services and resources to save people and property from harm (1). Response is likely to involve emergency services such as fire and rescue teams in an earthquake (1) (d). • Recovery this is concerned with post disaster reconstruction and restoration of the local built and natural environment (1). • Mitigation is an extension to recovery. This is the active steps taken to minimise the negative impacts associated with the hazard (1). Constructing earthquake proof building or flood protection systems are examples of mitigation (1) (d). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
05	2	**Assess the usefulness of Figures 9a–9d in presenting information on volcanic eruptions.** **AO3** – There should be assessment of the information provided. This should include an awareness of the strengths and limitations of the techniques used to present information in this dataset. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of a geographical issue or question. Clear analysis of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence.	**6** **AO3=6**

		Level 1 (1–3 marks) **AO3** – Basic analysis of a geographical issue or question. Basic analysis of the quantitative and qualitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence. <u>Notes for answers</u> **AO3** • The first graph is useful in that it provides an overview of the countries which experience deadly volcanoes. However, it is not possible to see specifically where these occur or when they occurred. Also, the scale uses a gradation of the colour green but on the map it is only possible to ascertain perhaps 5 colours and practically impossible to identify the number of deaths. Perhaps its only use is that it does given some sense of the relative impact on loss of life by place. • The second resource (proportional circles) is also significantly limited. Whilst it is possible to see the most deadly volcanoes (eg Ilopanga, Pele, Ruiz), it is not possible to identify where these are located so the first and second resources cannot adequately be compared or related to each other. Similarly, most of the volcanoes have no names so are only useful in terms of identifying the type. Clearly the most deadly are stratovolcanoes. • The third resource presents two pieces of information and this is more useful. There appears to be a loose correlation between VEI and frequency. VEIs tend to be more explosive where volcanoes are more frequent. • The final resource is also of limited value and arguably not presented well. The data is discrete and not continuous. For instance, the event around 450 AD appears to have caused around 30 000 deaths. It is hard to understand what is being showing either side of this spike. It implies deaths continued until around 750 AD as a result of this incident because there are no other spikes. This does not seem plausible. • Overall then, the resource has fairly substantial flaws as a method of presenting this data. • Expect to see reference to at least two sources for access to Level 2. Credit any other valid analysis.	

05	3	**Using Figure 10 and your own knowledge, assess the challenges in managing an event such as this.** **AO1** – Knowledge and understanding of impact and management issues associated with earthquakes. **AO2** – Application of knowledge and understanding to the novel situation, to assess the scale of challenge associated with managing the Haiti Earthquake. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Evaluation is detailed and well supported with appropriate evidence. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Evaluation is evident and supported with clear and appropriate evidence. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Evaluation is basic and supported with limited appropriate evidence. <u>Notes for answers</u> **AO1** • The nature of seismicity and its relation to plate tectonics: forms of seismic hazard: earthquakes, shockwaves, liquefaction, landslides. Spatial distribution, randomness, magnitude, frequency, regularity, predictability of hazard events. • Impacts: primary/secondary; environmental, social, economic, political. Short and long-term responses; risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation.	**9** **AO1=4** **AO2=5**

		• Impacts and human responses as evidenced by a recent seismic event. **AO2** • Clearly management in this context is linked to dealing with the aftermath. Responses are likely to consider a range of temporal scales from immediate aftermath to the much longer term. • The biggest management issue is scale. This event has clearly affected a huge number of people – approximately one third of the population and these are only the hardest hit. • Another major issue is that the epicentre is the capital city Port Au Prince. As this is also likely to be the administrative centre, being hit so hard will make the management and deployment of services even harder. Accessing such a densely populated region at the speed required must have proved unmanageable. The 3 million + affected people live in area with a diameter of only around 50km. • Trying to access all areas affected in the timescales required must have been impossible. This will almost certainly have exacerbated the loss of life. Younger people up to the age of 40 make up around 80% of the most affected. Some may link this to poverty and residence in sub-standard housing. • The poverty will also have contributed to the scale of the management challenge. It will no doubt have been the case that people were simply not able to help themselves. The humanitarian funding will have gone some way to plugging the poverty gap but some may note how disappointing it appears that $800 million remains uncommitted. Clearly turning those pledges into real commitments of funding and support has proved yet another challenge. Credit any other valid assessment.	

05	4	**How far do you agree that global governance is crucial in meeting the challenge of reducing incidence of wildfires?** **AO1** – Knowledge and understanding of the cause of wildfire. Knowledge and understanding strategies to manage wildfire. Knowledge and understanding of the role of global governance in taking global action. **AO2** – Application of knowledge and understanding assess potential for global governance structures to reduce incidence of wildfire. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout.	**9** **AO1=4** **AO2=5**

AO2 – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Evaluation is detailed and well supported with appropriate evidence.

Level 2 (4–6 marks)
AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy.

AO2 – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Evaluation is evident and supported with clear and appropriate evidence.

Level 1 (1–3 marks)
AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy.

AO2 – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Evaluation is basic and supported with limited appropriate evidence.

Notes for answers
AO1
- Nature of wildfires. Conditions favouring intense wildfires: vegetation type, fuel characteristics, climate and recent weather and fire behaviour. Causes of fires: natural and human agency. Short and long-term responses; risk management designed to reduce the impacts of the hazard through preparedness, mitigation, prevention and adaptation. Impact and human responses as evidenced by a recent wildfire event.
- The emergence and developing role of norms, laws and institutions in regulating and reproducing global systems.
- Interactions between the local, regional, national, international and global scales.

AO2
- Wildfire is an increasingly severe problem affecting large areas of the planet. Areas not normally associated with wildfire are also becoming affected. The Siberian wildfires of 2019 are a case in point.
- Some may also point to places which are prone to wildfire, which appear to be experiencing even more extreme events. The Australian wildfires of 2019–20 are likely to feature in this regard.
- Responses are likely to suggest that climate change is an increasing threat to natural vegetation in such areas and therefore global systems can play their part in reducing the risk and impact of such events. Expect to see responses focus on global agreements to reduce greenhouse gas emissions.
- Equally though there should be some acknowledgement that reducing the impact of wildfire requires local action and national policy. For

		instance, in the case of the Siberian wildfire, there was an active policy in 2019 that only areas likely to affect local populations should be tackled by firefighters. This meant that millions of acres of wildfire were effectively left to burn themselves out. • In the case of the Australian wildfires, logging practices are considered to have contributed significantly to the widespread nature of the fires. This type of deforestation leaves behind huge amount of dead vegetation which becomes tinder in the dry conditions. • Some responses may consider the local actions of planners and managers to predict wildfire and take actions on the ground to reduce incidence. • Global governance is therefore crucial in tackling the spread and incidence of wildfire but so too is local action and national policy on fire prevention and mitigation strategies. Credit any valid assessment.	

05	5	**To what extent does plate tectonic theory help in understanding the development of landforms associated with plate movement?** **AO1** – Knowledge and understanding of plate tectonic theory. Knowledge and understanding of landforms associated with seismicity and vulcanicity. **AO2** – Application of knowledge and understanding to assess the extent to which plate tectonics accounts for landforms associated with seismicity and vulcanicity. <u>Notes for answers</u> **AO1** • Earth structure and internal energy sources. Plate tectonic theory of crustal evolution: tectonic plates; plate movement; gravitational sliding; ridge push, slab pull; convection currents and sea-floor spreading. • Destructive, constructive and conservative plate margins. Characteristic processes: seismicity and vulcanicity. Associated landforms: young fold mountains, rift valleys, ocean ridges, deep sea trenches and island arcs, volcanoes. • Magma plumes and their relationship to plate movement. **AO2** • Expect to see exploration of the link between plate tectonic theory and its associated landform development. Expect also to see consideration of theories around gravitational sliding (ridge push / slab pull). • Convection currents and ridge push / slab pull theories are likely to be linked to ridges and rift valleys (such as Mid-Atlantic Ridge or the East African Rift Valley) and trenches such as the Marianas Trench). The theory suggests that upwelling magma is forced through the lithosphere as a result of convection in the mantle and asthenosphere, lead to ridge formation. Some may suggest that ridge push is also suggested to play a part in the sea floor spreading.	**20** **AO1=10** **AO2=10**

		• Expect to consideration of young fold mountains as an extension to the idea of trench formation and associated with slab pull /gravitational sliding theories. Reference to The Andes and Himalayas may feature. Some may go further and draw connections to different types of plate boundary, expect to see reference to constructive, destructive and collision boundaries. • Some may refer to evidence to support the theory such as palaeomagnetism or those associated with Wegener's theories (the jigsaw fit, brachiopod fossil remains etc.). • In terms of vulcanicity the same theories can be used to account for island arcs such as Japan or the Kermadec Arc may feature. The Pacific Ring of Fire may also feature. • Hot spots caused by magma plumes are also likely to feature and contributing theory to the development of island chains such as the Hawaiian islands. This can be further used to support the idea that the pacific plate is moving in a north westerly direction, as the age of the rock making up the islands increases in the same north westerly direction. • In terms of the question expect to see most view plate tectonic theory as providing a secure link to process and landform, with further development and support provided by gravitational sliding and hot spots. Credit any other valid assessment.	

Marking grid for Question 5.5

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).
Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.

Question 6 Ecosystems under stress

Qu	Part	Marking guidance	Total marks
06	1	**Outline the effect of human activity on succession in one plagioclimax that you have studied (eg heather moorland).** Point marked Allow 1 mark per valid point with extra mark(s) for developed points (d). For example: Point marked **AO1** • Natural succession processes are interfered with such that the natural environment never reaches climatic climax (1). • In heather moorland, the natural vegetation of temperate deciduous woodland has been removed a long time ago by early settlers (1). The high rainfall and strong wind caused soil erosion leaving the environment unsuitable for colonisation by trees (1). Heather has colonised the land and is not outcompeted for sunlight (1). This is because of controlled burning which occurs on a 10–15 year rotation (1) (d). The burning stops the process of secondary succession and retains an environment suitable for heather to regrow (1). The notes for answers are not exhaustive. Credit any valid points.	**4** **AO1=4**
06	2	**Analyse the data shown in Figure 11.** **AO3** – Analysis relates to identification of pattern and trends as well as anomaly. There is also opportunity to manipulate data. Mark scheme **Level 2 (4–6 marks)** **AO3** – Clear analysis of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence. **Level 1 (1–3 marks)** **AO3** – Basic analysis of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence.	**6** **AO3=6**

		Notes for answers: **AO3** • Both coral regions and tropical/subtropical forests are under substantial threat from a range of climate extremes. • Nearly all of the threats appear to be in the tropics though extreme heat and flooding do appear outside of these locations. • Extreme heat appears largely to be found near to the tropics though there are some anomalous exceptions eg Indonesia. • One might reasonably expect extreme heat to be an issue in the same locations as drought / fire but this is barely ever the case. • Many of the hazards appear in clusters eg drought / fires in East Africa, Amazonia and Indonesia. • Hurricanes are found only in very narrow latitudes mainly close to the Tropic of Cancer. • Flooding appears to be closely balanced between river and coastal. • Coral bleaching appears to be the biggest and most wide ranging threat to the regions. Practically every coral region is affected by bleaching. Credit any other valid analysis.	

06	3	**Using Figure 12 and your own knowledge, assess the implications of this information for the management of coral reefs.** **AO1** – Knowledge and understanding of the issues facing coral reef. Knowledge and understanding of the management of coral reef. **AO2** – Application of knowledge and understanding to assess management issues facing coral reefs suggested by the novel situation. <u>Mark scheme</u> **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Analysis is detailed and well supported with appropriate evidence. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Analysis is evident and supported with clear and appropriate evidence. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Analysis is basic and supported with limited appropriate evidence. <u>Notes for answers</u> **AO1** • The distribution and main characteristics of coral reef ecosystems. Environmental conditions associated with reef development. • The following aspects should be examined with reference to a named, located coral reef: • Factors in the health and survival of reefs: • Natural: Water temperature, acidity, salinity, algal blooms. • Human activity and its impact: Major drainage basin schemes, onshore development, desalination, pollution, tourism, fishing.	**9** **AO1=4** **AO2=5**

		• Future prospects for coral reefs. **AO2** • The information presented suggest a bleak outlook for much of the world's coral. • There is a huge disparity in the amount of coral under threat from bleaching. This suggests a more regional approach to coral management is needed rather than a global response. • The climate change issue is clearly a major threat to coral and this requires global action to reverse the expected rising sea temperatures. Closely aligned to this is the impact of extreme weather events. Whilst this is not covered in the resource, some may consider the potential damage caused by increasingly severe and intense tropical storms on coral. Again, management in this context is entirely connected to seeking global agreement on reducing atmospheric carbon levels. • Given its importance to global biodiversity as well as its economic value to countries (such as Belize) and regions (such as the Caribbean), a more localised management response may be required. • Expect to see a focus on measures to limit fishing and eradicate the most harmful types of fishing, such as dynamite fishing. Local pollution reduction measures may also feature. • Case studies such as the management of Andros Barrier Reef, Bahamas may feature. By declaring their reef system to be a national park, they strictly controlled development which might harm the coral ecosystem. They have strictly controlled fishing quotas and recreational fishing, as well as taking action to regrow endangered coral species. • Responses should acknowledge that local management is at least as important as global action on reversing the trend of sea temperature rise. Credit any other valid assessment.	

06	4	**How far do you agree that global governance has a role to play in the conservation of the savanna grassland biome?** **AO1** – Knowledge and understanding of the conservation issues in savanna grassland. Knowledge and understanding strategies to manage savanna grassland. Knowledge and understanding of the role of global governance in taking global action. **AO2** – Application of knowledge and understanding to analyse the contributing factors leading to the development of this biome. Mark scheme **Level 3 (7–9 marks)** **AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout. **AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Evaluation is detailed and well supported with appropriate evidence. **Level 2 (4–6 marks)** **AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant though there may be some minor inaccuracy. **AO2** – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Evaluation is evident and supported with clear and appropriate evidence. **Level 1 (1–3 marks)** **AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy. **AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Evaluation is basic and supported with limited appropriate evidence. Notes for answers **AO1** • The concept of the biome. The global distribution of major terrestrial biomes. • The nature of two contrasting biomes: tropical rainforest and savanna grassland to include: • the main characteristics of each biome • ecological responses to the climate, soil and soil moisture budget – adaptations by flora and fauna • human activity and its impact on each biome	**9** **AO1=4** **AO2=5**

		• typical development issues in each biome to include changes in population, economic development, agricultural extension and intensification, implications for biodiversity and sustainability. • The emergence and developing role of norms, laws and institutions in regulating and reproducing global systems. • Interactions between the local, regional, national, international and global scales. **AO2** • Responses should be aware of the importance of savanna grassland; it is home to some of the world's most iconic endangered species of animal – Lions, cheetahs, elephants, rhinos, hippos, wildebeest, giraffe, zebra and antelope. There are substantial pressures to develop the land as a result of growing population demands. • Conservation is likely to be focused on sustainable farming practices and tourism. The key is that economic development continues without degrading the land. • The pressure to manage the conflicting interests of wild animals and farmers is a huge issue and a growing problem. • Strategies are being employed improve the sustainability of farming. Expect to see reference to afforestation schemes, controlled burning to manage wildfire and education around crop rotation to protect soils. • In considering the global governance response might reasonably suggest international agreements banning ivory sales are one way to support conservation in the savanna of Africa. • Education programmes and aid initiatives can also help to support the local population. Some may even consider measures to reduce birth rates as indirectly supporting the conservation of savanna. Organisations such as the World Wildlife Fund or the African Wildlife Foundation seek to raise funds to support conservation efforts. There is certainly a global dimension to this work. • Expect most to suggest that success lies more in local action and national policy, with important lines of communication between countries to agree common approaches to savanna management. For instance, the establishment of national parks such as Kruger has gone some way to support greater conservation. Credit any other valid approach. Evaluation should be based upon preceding content.	

06	5	**With reference to the tropical rainforest biome, assess the view that latitude is the most important factor in its natural development.** **AO1** – Knowledge and understanding of the factors leading to the development of the tropical rainforest biome. **AO2** – Application of knowledge and understanding to assess the factors leading to the development of the biome. <u>Notes for answers</u> **AO1** • The concept of the biome. The global distribution of major terrestrial biomes. • The nature of tropical rainforest: the main characteristics of the biome. • Ecological responses to the climate, soil and soil moisture budget – adaptations by flora and fauna. • Nature of ecosystems – their structure, energy flows, trophic levels, food chains and food webs. • Application of systems concepts to ecosystems – inputs, outputs, stores and transfers of energy and materials. Concepts of biomass and net primary production. • Concepts of succession: seral stages, climatic climax. • Mineral nutrient cycling. • Nature of terrestrial ecosystems and the inter-connections between climate, vegetation, soil and topography which produce them. **AO2** • Latitude is certainly a hugely important factor. Tropical rainforest is located largely though not exclusively between the tropics. It is important because it controls volumes of incoming solar energy. Low latitudes are much more energetic than higher latitudes. The approximate solar constant 2.00 cal/min/cm^2 from a vertically overhead sun at the top of the atmosphere becomes much less concentrated as latitude increases. • However, there is no continuous belt of rainforest across the land masses between the tropics so there must be other factors at play. Rainforests only cover around 5% of the world's landmass and it is the combination of high temperatures (27^{o}C), with low diurnal range and high rates of precipitation (2000mm + per year) which characterise the climate and therefore preconditions for growth of rainforest. • At the same latitudes there are desert biomes and savanna grassland, so latitude clearly is not enough of an explanation; it is the latitude combined with the high rates of precipitation. So whilst the African Savanna is on the same latitude, it has a long dry season which could not support the complexity of the vegetation found in the tropical rainforest such as that found in Amazonia or the Congo Basin. • Some may consider the climatic factors which support and promote the growth of rainforest. Expect to see reference to the Inter Tropical Convergence Zone (ITCZ), the low pressure system which generates typically high levels of rainfall daily.	**20** **AO1=10** **AO2=10**

		• To understand the natural development of the biome, responses should also consider the interactions between climate, vegetation and soils. This is also likely to include nutrient cycling and an understanding the way in which vegetation rapidly decays to produce a thin fertile layer of soil within the deep latosol profile. • It is also legitimate to consider adaptation as an ecological response to climate. This is a key factor in the natural development of the biome. • Expect many to conclude that latitude is a key driver but natural processes are also critical in the development of the tropical rainforest. Credit any other valid approach.	

Marking grid for Question 6.5

Level/ Mark Range	Criteria/Descriptor
Level 4 (16–20 marks)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1). • Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).
Level 3 (11–15 marks)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts and processes (AO1). • Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

Level 2 (6–10 marks)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change (AO1). • Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).
Level 1 (1–5 marks)	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2). • Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts and processes (AO1). • Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).
Level 0 (0 marks)	• Nothing worthy of credit.