ADDITIONAL SPECIMEN
MATERIAL: SET 3

GCSE
GEOGRAPHY

PAPER 1 LIVING WITH THE PHYSICAL ENVIRONMENT

Mark scheme

8035/1

V1.1

Additional specimen

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 Assessment Writer.

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 average 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.

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 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 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.

Assessment of spelling, punctuation, grammar and use of specialist terminology (SPaG)
Accuracy of spelling, punctuation, grammar and the use of specialist terminology will be assessed via the indicated 9 mark questions. In each of these questions, three marks are allocated for SPaG as follows:

- **High performance** – 3 marks
- **Intermediate performance** – 2 marks
- **Threshold performance** – 1 mark

<table>
<tr><th>Qu</th><th>Part</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>01</td><td>1</td><td>Conservative/Passive/Transform
AO1 – 1</td><td>1</td></tr>
<tr><td>01</td><td>2</td><td>One mark for the correct answer:

D. The majority of volcanoes occur in a line through the central part of North Island.

No credit if two or more statements are shaded

AO4 – 1 mark</td><td>1</td></tr>
<tr><td>01</td><td>3</td><td>4.7 metres

No credit if two or more answers are circled

AO4 – 1 mark</td><td>1</td></tr>
<tr><td>01</td><td>4</td><td>
<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>5-6</td><td>AO2 Shows thorough geographical understanding of processes causing both volcanic and earthquake activity
AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in analysing why tectonic activity occurs in New Zealand</td></tr>
<tr><td>2 (Clear)</td><td>3-4</td><td>AO2 Shows some geographical understanding of the processes causing volcanic and/or earthquake activity
AO3 Demonstrates reasonable application of knowledge and understanding in analysing why tectonic activity occurs in New Zealand</td></tr>
<tr><td>1 (Basic)</td><td>1-2</td><td>AO2 Shows limited geographical understanding of the processes causing volcanic and/or earthquake activity
AO3 Demonstrates limited application of knowledge and understanding in analysing why tectonic activity occurs in New Zealand</td></tr>
<tr><td></td><td>0</td><td>No relevant content</td></tr>
</table>

Indicative content

• Level 3 responses will be detailed and well developed. A wide range of geographical terms effectively applied. Complete sequence with processes explained.

• Level 2 will have linked or elaborated statements and some accurate use of geographical terms.

• Level 1 may comprise simple statements with limited subject vocabulary. Partial sequence or random points made.</td><td>6</td></tr>
</table>

		• The command word is “suggest” so responses should set out the likely causes of both volcanoes and earthquakes from the sources provided, showing an understanding of the processes involved. The question requires analysis of the sources, as well as understanding of tectonic processes. • Accept explanations that refer to slab pull and gravitational movement of plates: the denser plate sinks into the mantle under the influence of gravity, which pulls the rest of the plate along behind it (slab pull). • Credit also the more conventional theory of the movement of convection currents in the upper mantle as the mechanism for plate movement and subduction. • Understanding of processes causing volcanic activity at destructive margins. Two plates move towards each other. The denser plate sinks below the lighter, less dense plate and melts in the subduction zone. Hot magma rises up through the overlying mantle and lithosphere, and some can eventually erupt out at the surface producing a belt of volcanoes. • Credit the idea that magma becomes increasingly viscous or sticky as it rises to the surface, producing composite volcanoes which are steep sided and have violent eruptions. • Understanding of earthquakes at destructive margins. As the two plates converge, pressure builds up. The rocks eventually fracture causing an earthquake. Most happen at shallow depths below the surface where the plates collide. They also occur at greater depth, in the lower part of the subduction zone. • Accept relevant explanations that link causes of volcanic activity and earthquakes. • Application of knowledge and understanding to the map and cross section. The Pacific Plate is subducted beneath the Indo-Australian Plate. Expect recognition that this plate boundary is destructive and that the denser ocean crust is subducted. • Earthquake epicentres occur in a line mainly but not entirely to the west of the plate margin where the plates collide. Volcanoes are confined to North Island in a linear belt, but some further west and north west where magma rises to the surface. • Max L1 for explanation of tectonic activity at constructive or conservative margins. • Max Level 2 for explanation of one of earthquakes or volcanoes only. • No credit for description of pattern in isolation. • It is not essential for responses to recognise existence of two oceanic plates. There should be some (implied) reference to Figure 1 and/or Figure 2 to access Level 2.	

		AO2 – 3 marks AO3 – 3 marks	

01	5	There has been an overall decrease in extent of Arctic Sea ice (1). The changes in Arctic sea ice have fluctuated considerably (1) There was limited change from 1979-1996 (1) followed by rapid decrease 1996 onwards (d) (1). Credit use of data shown on graph or for data manipulation. eg a decrease in extent from almost 8 million km to approx. 4 million at lowest point.(1) A loss of almost 50% (in 36 years). (1) A decrease from 7.2 million sq km to 4.8 million sq km between 1979-2016. (1) Considerable fluctuations from year to year-rapid decrease 2006-2007, followed by rapid increase 2007-2009.(1) No credit for stating that there has been a steady or consistent decrease. No credit for explanations of change. AO4 – 2 marks	2

01	6	Two separate ways are required. Credit relevant human activities that link to rising temperatures/enhanced greenhouse effect and diminishing sea ice. The links with extent of Arctic sea ice do not have to be explicit. Eg Increased burning of fossil fuels (1) Increased manufacturing of products (1) Rapid rates of deforestation (1) Increased methane emission from agriculture/mining (1) Carbon emissions from transport using oil and gas. (1) Greater use of fertilisers/sewage farms (1) Use of halocarbons (‘man made’ powerful greenhouse gas used by industry to make solvents and for equipment cooling). (1) AO1 – 2 marks	2

01	7		4

Level	Marks	Description
2 (Clear)	3-4	AO1 Demonstrates accurate knowledge about long- term climate change. AO2 Shows a clear understanding of the natural factors that help to account for long-term changes in climate. Explanations are developed.
1 (Basic)	1-2	AO1 Demonstrates limited knowledge about long- term climate change. AO2 Demonstrates some understanding of the natural factors that help to account for long-term changes in climate. Explanations are partial and limited in scope.
	0	No relevant content

Indicative content

- Level 2 responses will be developed explanation(s) or linked statements about the natural factors affecting long term climate change, with some accurate use of geographical terms
- Level 1 responses are likely to be simple random statements, with little development, sequence or explanation. Limited subject vocabulary used.
- The command word is “explain” which requires an account as to how and why natural factors may contribute to climate change
- Knowledge of long term changes in climate since start of Quaternary period. Patterns of alternating cold periods (glacials) and warm periods (interglacials). Up to 10 glacial periods in past million years. Ice age continued until 12000 years before present.
- Understanding the effects of orbital Changes. Changes from a circular to an oval orbit can affect the amount of sunlight the earth receives. It takes 100,000 years for the Earth’s orbit to change from being more circular to an ellipse and back again. This eccentricity cycle coincides closely with the alternating cold (glacial) and warm (inter-glacial) periods in the Quaternary period. These changes are called Milankovitch Cycles. The Earth wobbles on its axis leading to changes in its tilt. When the Earth is more upright, it receives a greater amount of energy from the sun and experiences higher temperatures.
- Understanding of the effects of volcanic activity. Volcanoes can release large amounts of ash. This can reflect the Sun’s rays causing the planet to cool. Over time however, eruptions can release large quantities of greenhouse gases eg. Carbon dioxide. These gases can trap the Sun’s rays causing the planet to warm.
- Expect both factors to be explained for top of Level 2, but a well-developed explanation of one factor gains access to low Level 2.
- Reject human causes such as the enhanced greenhouse effect/global warming.

		AO1 – 2 marks AO2 – 2 marks	

01	8	One mark for each correct word or description Figure 4 shows that the pattern of winds moving around the hurricane centre was anticlockwise because **the clouds show an anticlockwise pattern/the clouds spiral inwards/of the way the clouds are arranged (1)** At X, the eye of the hurricane, the weather conditions were likely to be **calm/mostly clear skies/very little or no rain/low wind speeds (1)** Credit other similar statements AO2 – 1 mark AO3 – 1 mark	2

01	9	Two separate primary effects should be stated, based on evidence in Figure 5 Eg Roofs of many houses blown away/destroyed (1) Much damage to buildings, with some completely destroyed/liable to collapse (1) Many people made homeless.(1) Damage to infrastructure such as pathways/roads. (1) No credit for longer term or secondary effects, or for effects not observable in the photograph. AO4 – 2 marks	2

01	10	Level	Marks	Description	9
		3 (Detailed)	7-9	AO1 Demonstrates detailed knowledge of immediate and long-term strategies used in response to tropical storms, with secure use of detailed exemplification AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of a tropical storm. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating a wide range of responses to tropical storms	
		2 (Clear)	4-6	AO1 Demonstrates clear knowledge of immediate and/or long-term strategies used in response to tropical storms, with some use of exemplification. AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of a tropical storm. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating some responses to tropical storms	
		1 (Basic)	1-3	AO1 Demonstrates limited knowledge of immediate and/or long-term strategies used in response to tropical storms, with little or no exemplification. AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of a tropical storm. AO3 Demonstrates limited application of knowledge and understanding in evaluating responses to tropical storms	
			0	No relevant content	
		Indicative content • Level 3 will be a well-developed answer. Classifies responses into immediate and long-term. Must contain a named example, with clear assessment. Evaluates responses. • Level 2 Linked or elaborated statements, accurate use of geographical terms. May classify into immediate and long-term and assess a range of responses to tropical storms. May refer to named example. May start to evaluate responses. • Level 1 responses are likely to consist of simple statements, with limited use of subject vocabulary. May be limited to generic statements, a list of strategies without development or classification. May be limited to a single strategy. May make a limited evaluation. • The command is to “evaluate”, which means to consider a mix of responses to tropical storms and weigh them up so as to come to a conclusion about their effectiveness, degree of success or validity.			

		• Responses to storms should be categorised into immediate and long-term. Strategies adopted may depend on the types of effects: social, economic or environmental. Responses to storms may vary depending on whether the impacts are primary or secondary. Credit distinctions between responses in HIC and LICs/NEE countries and between urban and rural settings. • Understanding of human factors affecting responses: population density, urbanisation of the population, poverty, strength of infrastructure, education, effectiveness of government, disaster planning. • Understanding of physical factors affecting responses: intensity of the storm, speed of movement, distance from the sea, physical geography of coastal impact zone. • HICs and some NEEs may have resources and technology, such as satellites and specially equipped aircraft, to predict and monitor the occurrence of storms. They are also equipped to train the emergency services appropriately and to educate people about necessary precautions. Storm warnings can be issued to enable the population to evacuate or prepare themselves for the storm. People can prepare by storing food and water or boarding up their windows. • Immediate responses may include evacuation of people before storm arrives, rescue people cut off by flooding, set up temporary shelters, provide supplies of food, water, gas, electricity supplies, recover dead bodies to reduce disease risk, NGOs provision of aid workers, supplies, equipment. • Long term responses may include repair of homes, rehousing programmes, repair of damaged infrastructure, improved forecasting techniques, improved flood defences, promotion of economic recovery, improved building regulations, changed planning rules to avoid most vulnerable areas. • Understanding how different groups of people respond to tropical storms, including individuals, organisations, local governments, the national government and international aid organisations/foreign governments. • Individuals can construct makeshift flood defences to prevent their land from being flooded (eg sandbags). • Local governments ensure that education is provided and messages are given to locals to warn residents about potential hazards such as flooding and contaminated drinking water supplies. • Organisations identify hazard-prone areas at risk of flooding/environmental damage. • The national government ensures that relevant monitoring bodies produce the necessary information in forecasting the weather. It may mobilise military or emergency aid resources to prepare flood defences, evacuate people, respond to contamination, and protect crops and wildlife. • Knowledge and understanding of specific example of a tropical storm eg Haiyan. Immediate/emergency responses. Government evacuated over 1 million people-over 1200 evacuation centres. Many sought refuge in an	

		indoor stadium in Tacloban but some died when it was flooded. The government sent essential equipment and medical supplies to some regions. Emergency aid supplies arrived three days later by plane once the airport was reopened. It was a week before power was restored in some regions and partially in others. Within two weeks, over one million food packs and 250,000 litres of water were distributed. $1.5 billion in foreign aid. A curfew was imposed two days after Typhoon Haiyan to reduce looting. • Longer term responses included rebuilding of roads, bridges and airport. Rice farming and fishing quickly re-established. Aid agencies helped to fund new fishing boats. Thousands of homes built away from flooded areas. More cyclone shelters. New storm surge warning system 'Build Back Better' -buildings upgraded with improved protection. Mangroves replanted. Plans to build new road dike. • Assessment/evaluation of different types of response. Individual responses have a relatively small impact on reducing damage. People may be able to protect their own land or property but not much beyond that. National governments can have the biggest impact because they have the resources, capacity and authority to respond to economic, social and environmental effects on a large scale. Aid organisations may focus on social impacts (safety, food, shelter), but will often invest in longer term projects and solutions. • Effectiveness of responses may be determined by many factors, including available technology, infrastructure, communications, remoteness of area affected, degree of preparedness, monitoring systems, capacity of emergency services, education, building design. The distinction between HIC and NEE responses can be over-simplistic. Some poorer countries such as Bangladesh have early warning systems, tracking, cyclone shelters, coastal defences which have reduced death tolls considerably. • Reject discussion of impacts unless directly related to responses. • A purely generic response without clear exemplification is limited to Level 2. • A response that lacks evaluation of responses is limited to Level 2. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks **Spelling, punctuation and grammar (SPaG)** **High performance** • Learners spell and punctuate with consistent accuracy • Learners use rules of grammar with effective control of meaning overall • Learners use a wide range of specialist terms as appropriate **Intermediate performance** • Learners spell and punctuate with considerable accuracy • Learners use rules of grammar with general control of meaning overall • Learners use a good range of specialist terms as appropriate	**3** **2**

		Threshold performance • Learners spell and punctuate with reasonable accuracy • Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall • Learners use a limited range of specialist terms as appropriate **No marks awarded** • The learner writes nothing • The learner's response does not relate to the question • The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning	**1** **0**

02	1	One mark for the correct answer: C. A high proportion of the original forest cover has been removed in Africa and Europe. No credit if two or more statements are shaded AO4 – 1 mark	1

02	2	One mark for each reason or two marks for single developed explanation. Eg Rainfall and temperatures are high all year round (1). This encourages rapid growth of a large number of plants (d) (1) Because rainforests are located in tropical regions, they receive a lot of sunlight (1), which is converted to energy by photosynthesis, so there are many plants. (d) (1) The canopy structure of the rainforest provides many places for plants to grow and animals to live (1). The canopy offers sources of food, shelter, and hiding places (d) (1) The rainforest nutrient cycling is rapid in hot, damp conditions on the forest floor (1), so there is rapid decay of dead plant material and plentiful nutrients easily absorbed by plant roots (d) (1). No credit for description of plants or plant adaptations to climate. AO1 – 2 marks	2

02	3	One mark for the correct answer: B. The highest level of deforestation was in 1995 and the lowest level was in 2012. No credit if two or more statements are shaded. AO4 – 1 mark	1

02	4	One mark for each separate reason. Accept any plausible reason. This requires application of knowledge to interpret Figure 7 Eg as the percentage of protected land has increased, so annual deforestation has decreased (1) There has been greater awareness of the need to preserve rainforests for the future (1) There has been greater political pressure to reduce deforestation due to worries about climate change (1) There may have been stricter government controls on logging companies and farmers (1) Credit ideas relating to selective logging and replanting, conservation for scientific research, ecotourism and debt for nature swaps. AO3 – 2 marks	2

<table>
<tr>
<td>02</td>
<td>5</td>
<td>
<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>5-6</td><td>AO2 Shows thorough geographical understanding of the economic impacts of deforestation
AO4 Detailed and relevant reference made to the information about economic impacts of deforestation shown in Figure 8.</td></tr>
<tr><td>2 (Clear)</td><td>3-4</td><td>AO2 Shows some geographical understanding of the economic impacts of deforestation
AO4 Clear and mainly relevant reference made to the information about economic impacts of deforestation shown in Figure 8.</td></tr>
<tr><td>1 (Basic)</td><td>1-2</td><td>AO2 Shows limited geographical understanding of the economic impacts of deforestation
AO4 Limited or partial reference made to the information about economic impacts of deforestation shown in Figure 8.</td></tr>
<tr><td></td><td>0</td><td>No relevant content</td></tr>
</table>

Indicative content

• Level 3 responses will be detailed and well developed. Some use of Figure 8 (direct or inferred) and specific own knowledge. Impacts can be positive and/or negative.

• Level 2 responses will be linked statements with some elaboration. Some use of figure 8 (direct or inferred) and own knowledge. Impacts can be positive and/or negative.

• Level 1 responses likely to consist of simple statements, with limited use of subject vocabulary. May only use information in Figure 8 or own knowledge.

• The command word “explain” is used, which means to provide a reasoned account of how and why deforestation has economic impacts.

• Understanding of positive impacts. Deforestation is associated with some economic development. Development of land for mining, farming and energy will lead to jobs both directly (construction, farming) and indirectly (supply and support industries).

• Companies will pay taxes to the government which can be used to improve public services, such as education and water supply.

• Forest is cleared to make space for cattle grazing, from which large commercial companies can make profit.

• Improved transport infrastructure opens up new areas for industrial development and tourism. Products such as oil palm, soya and rubber provide raw materials for processing industries.

• Hydro-electric power provides cheap and plentiful energy, which can be used by all types of industry.

• Commercial logging companies and pulp processing/paper making can make sizable profits as a result of deforestation.
</td>
<td>6</td>
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		• Minerals such as gold and cobalt are very valuable, and earn large amounts of foreign exchange, as well as providing an industrial base. • Impacts are more likely to be seen as positive but credit idea that damage to forests, rivers, and marine life through deforestation could significantly reduce the overall wealth of a country as resources are lost and habitats destroyed. Deforestation can rob a country of potential renewable revenues, replacing valuable productive lands with virtually useless scrub and grassland. • Short-term economic exploitation through deforestation can be devastating to the long term, destroying valuable forest products and ecosystems. Plants that could bring huge medical benefits and high profits may become extinct. Ecotourism also suffers with deforestation, especially if forests are removed and rivers polluted. • Livelihoods of some local people are destroyed. Deforestation can cause loss of animals and plants they rely on to make a living. Illegal logging causes billions of dollars of losses to national economies annually. • Often the land is left ruined and many pollutants wash into rivers. Water quality is affected, shortages occur, with knock on effect on industry and wider economy. • Use of Figure 8. The photograph indicates the large scale of operations, processing, huge structural works, many buildings, transport of iron ore. Indicates huge investment of money, considerable employment of workers, possibly large commercial returns. • Use of factfile information. The Carajas scheme covers a vast area, and has a mix of economic activities. It is dominated by the massive iron ore mine, with some recent expansion nearby. Rail connection to coast ensures access to export markets. HEP generated locally, providing some employment and generating electricity for local industry. Major long-term reserves, likely to last for at least 70 years, ensuring continued economic development. Other minerals are exploited, likely to be exported abroad. Other economic activities may help to provide work and revenue. However the scheme affects the local economy, disrupting lives of Indian population, affecting their ability to work and carry out traditional lifestyles. • Responses must refer to Figure 8 (directly or inferred) to access Level 2 marks. AO2 – 3 marks AO4 – 3 marks	

02	6	One mark for an appropriate description of the role. Eg Producers are organisms that produce their own food (1). They take energy from the Sun and make it into chemical energy (food) (1) Plants produce chemical energy by the process of photosynthesis (1). They are at the bottom of the food chain and may be eaten by consumers(1) AO2 – 1 mark	1

02	7	One mark for an appropriate reason. Eg The entire organism is not consumed or digested (1). Parts such as roots, woody stems, bones, scales, feathers etc aren't eaten (1). Energy is used up by organisms in each trophic level for movement and transport inside their bodies (1). Energy is used in respiration and is released from the body of the organism as heat(1). Energy becomes lost in excretion.(1) AO1 – 1 mark	1

02	8	One mark for each correct description or inference If a disease reduced the number of primary consumers, one effect on the food chain would be that carnivore populations may decrease rapidly/only omnivores would survive/plant life will flourish and grow rapidly (1) Decomposers help to return nutrients to the soil by breaking down dead plants and animals/breaking down organic waste or excreted material/releasing energy built up inside a plant or animal so that it can be recycled (1) Credit other plausible statements. AO2 – 1 mark, AO3 – 1 mark	2

02	9				9

Level	Marks	Description
3 (Detailed)	7-9	AO1 Demonstrates detailed knowledge of threats from human activities in environments on the fringe of hot deserts/cold environments AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts/cold environments. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts/cold environments.
2 (Clear)	4-6	AO1 Demonstrates clear knowledge of threats from human activities in environments on the fringe of hot deserts/cold environments AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts/cold environments. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts/cold environments.
1 (Basic)	1-3	AO1 Demonstrates limited knowledge of threats from human activities in environments on the fringe of hot deserts/cold environments AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts/cold environments. AO3 Demonstrates limited application of knowledge and understanding in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts/cold environments.
	0	No relevant content

- Level 3 will be a well-developed answer. Reasoned examination why human activity poses a risk to the chosen environment, with evaluation of the risks involved.
- Level 2 will have linked or elaborated statements and some accurate use of geographical terms. May outline several risks to the environment, but understanding of the link to environmental effect may be incomplete. May start to make an evaluation of the risks involved.
- Level 1 responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements, or a list of risks to the environment without development. May be limited to a single risk. May make a limited evaluation.

Indicative content for Environments on the fringe of hot deserts

- The command "to what extent" means that responses should reach a conclusion based on supporting evidence. The statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true. It requires evaluation of the degree of risk posed by human activity to the chosen environment.

- Understanding of the risks resulting from human activity. The principal risk is desertification. It is estimated that 20% of the world's population, in over 60 countries, have to cope with the threat of desertification. For instance, the Sahara has advanced over 250km southwards in the past 100 years.

- Understanding of how desertification occurs- the process of fertile land transforming into desert typically as a result of deforestation, drought, or improper/inappropriate agriculture.

Causes which link to human activity include:

- Population growth – more people need more food which puts pressure on the land.

- Migration brings even greater population pressure. Drought and desertification in one region will displace people to another fragile environment.

- Overgrazing – too many goats, sheep, cattle can destroy the vegetation. Nomadic groups used to wander freely, following the rain wherever it fell. Now they are restricted in movement and this places more pressure on land resources. The soil may turn to dust and become infertile.

- Over cultivation- grow too much without replenishing the soil and it becomes exhausted.

- Deforestation – trees are cut down for fuel and building. The loss of roots to hold the soil down makes the soils more fragile. Trees are stripped of their branches and eventually die. When vegetation has been destroyed the soil is exposed to the wind and the rain making it vulnerable to erosion. Exposed topsoil becomes baked hard by sunlight. When it finally arrives, intense rain washes over the soil rather than soaking into the ground. As it flows, it carries the topsoil away, and gullies and cracks appear. Once the soil has eroded, it becomes impossible for the vegetation to grow back.

- Water management - excessive irrigation in some places has led to waterlogging pf the ground. Where this has happened, salts, poisonous to plants have been deposited on the ground surface (salinisation). Drainage of underground aquifers due to excessive use of groundwater also poses a risk.

- War – many sub-Saharan countries have suffered for years from civil war, where crops and animals have been destroyed, leading to famine. Millions of people have been forced to move into desert fringe areas by armed conflicts. Some become refugees. The environmental resources in and around the cities and camps where these people settle come under severe pressure.

		• Further risks to the environment. Degraded land may cause downstream flooding, reduced water quality, sedimentation in rivers and lakes, and siltation of reservoirs and navigation channels. It can also cause dust storms and air pollution, resulting in damaged machinery, reduced visibility, unwanted sediment deposits. Loss of unique species and fragile habitats. • Enhanced greenhouse effect, partially caused by human activity globally, may contribute to increased risks of drought, higher temperatures etc in areas on fringe of hot deserts. • Credit examples of desertification. In Darfur region, 250,000 people have been killed and around three million made homeless by conflict since 2003. Drought, crop failure and livestock loss are major problems. Millions have fled their land and homes. They were housed in refugee camps, with help from the UN. But refugee camps create new environmental stress wherever they are located and cause desertification to spread. • In Kenya, nomadic Masai farmers have been forced onto marginal land. Traditional pastoral migration patterns have been disrupted and they have been compelled to use smaller areas of land for their cattle. Overgrazing has resulted from this, leading to land degradation and soil erosion by wind and water. • Other threats to the environment linked to human activity include exploitation for mineral resources and fossil fuels and high impact tourism in vulnerable areas such as the edge of the Thar desert and in East Africa. • Evaluation of extent to which human activities pose a risk. Although natural climate change, as part of a natural cycle, may contribute to desertification, there is little doubt that human misuse and mismanagement of the land poses a significant threat. Desertification is a major global ecological and environmental problem affecting many countries on the edge of hot deserts, which to a great extent is driven by human factors. **Indicative content for cold environments** • The command “to what extent” means that responses should reach a conclusion based on supporting evidence. The statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true. • Cold environments are extremely fragile and they can be easily damaged by human activities. Tundra vegetation takes a very long time to become established. It is a very delicate ecosystem that can be easily disturbed. Relatively minor developments – such as constructing a footpath can have serious long-term effects. Tyre tracks can be seen for many years after they were made. When the Sun hits the ruts it causes the permafrost to melt; this causes erosion and the ruts get bigger, and eventually the ruts turn into gullies. • Mining - mines have opened up resources, such as gold and diamonds, under the land in tundra regions, eg Arctic Canada. To extract them, roads have to be constructed through forests and across the tundra and supply bases built. This increases the number of vehicles in the tundra creating	

		noise and air pollution. Housing for hundreds of workers also needs to be constructed. • Pollution from mining and oil drilling has contaminated the air, lakes and rivers. The land around some nickel mines in Russia is so polluted that the plants in the area have died. The short growing season means that bulldozer tracks from the oil and natural gas industries could take centuries to restore. Burst pipes have spilt hundreds of thousands of gallons of crude oil in Alaska and Siberia, with major impacts on a fragile environment. Oil spills have caused serious water pollution in the Arctic Ocean. • Oil rigs have enabled oil to be drilled in the sea. In Alaska, the oil is exported from the Prudhoe Bay oil fields in raised pipes above the ground to the ice-free port of Valdez. Some animals' movements to traditional feeding and nesting grounds have been disrupted by these pipelines. • Pesticides have been used to control the masses of insects. Migrating birds feed on the insects and are subsequently poisoned or die due to their food source being removed. Oil spills have caused serious water pollution in the Arctic Ocean. • Natural gas (methane hydrate) is extracted from gas fields eg in western Siberia. Natural gas is pumped from beneath the permafrost and piped east across the tundra to the Norilsk metal smelter. Risk of rupture to pipelines and pollution. • New industries have led to the creation of towns such as Anchorage in Alaska which have been built to accommodate workers. These developments spoil the appearance of the natural landscape. Some problems with melting of permafrost where buildings and roads not constructed properly. • Illegal hunting and fishing is threatening the numbers of certain species, eg whales. Species of animals such as polar bears are highly specialised so find it difficult to adapt to change. • Tourism impacts are increasing-the rise in visitor numbers has potential to threaten animal breeding patterns and passenger boats could impact on the marine environment. • Threats to environment resulting from human induced climate change. Polar ice caps are melting because of an increase in global warming. As the tundra melts, the plant matter decomposes and returns carbon dioxide to the atmosphere, causing further warming. Rising sea levels, increased risks of flooding in some low-lying coastal areas. • Credit examples human activity causing risk to environment such as Exxon Valdez oil spill, 1989. • Evaluation of risk to environment from human activity. The tundra environment is among the least disturbed ecosystems in the world. However, that is changing with the discovery of large reserves of raw materials. Any damage to the tundra landscape is slow to recover. Environmental damage occurs at different scales, with causes that range	

		from local to global. Of greatest threat may be the impact of human-induced climate change. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

03	1	One mark for the correct answer: C. 596106 No credit if two or more answers shaded. AO4 – 1 mark	1

03	2	One mark for the correct answer: D. A beach with groynes, a small coastal settlement and an A road No credit if two or more answers shaded AO4 – 1 mark	1

03	3	One mark for the correct answer: D. 3.4 km No credit if two or more answers shaded. AO4 – 1 mark	1

03	4	One mark for the correct answer: C. south west No credit if two or more answers shaded. AO4 – 1 mark	1

03	5	The answer requires application of knowledge and understanding to photographic and/or map evidence. Answers must suggest a *reason* for deposition: Eg The river transports considerable material/sediment downstream which is deposited at the river mouth/in the estuary (1) Longshore drift carries material along the coast, which is deposited where the coastline changes direction (1) There is a mixture of river and tidal currents which change direction and cause material to be dumped (1) The river may have reduced energy levels due to gentle river gradient/impact of incoming tides (1) The breakwater in 6115 may stop the movement of sediment and so it collects in the area behind (1) AO3 – 1 mark	1

03	6		4

Level	Marks	Description
2 (Clear)	3-4	AO1 Demonstrates accurate knowledge about coastal transport and depositional processes and coastal spit formation. AO2 Shows a clear geographical understanding of the interrelationships between coastal environments and processes. Explanations are developed.
1 (Basic)	1-2	AO1 Demonstrates some knowledge of coastal transport and depositional processes and coastal spit formation. AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes. Explanations are partial and limited in scope.
	0	No relevant content

Indicative content

- Level 2 answers will contain linked statements showing understanding of the processes involved and the correct sequence of formation. Appropriate geographical terminology.
- Level 1 will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.
- The command is “explain”, so responses should provide a reasoned account of how and why a spit forms.
- The question implies knowledge of the processes of transportation and deposition as well as a landform of coastal deposition. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.
- The formation of a spit usually begins due to a change in the direction of a coastline. One source of material building up a spit is from longshore drift which brings material from further down the coast. Material is carried along the shore in a zigzag fashion by waves as they swash material up the beach at an angle and backwash material down the beach at a right angle. The material initially deposited is the largest material, dropped due to the reduction in energy.
- Some material may also be derived from offshore sources and, more importantly, river-borne sediments. Credit processes of transportation such as traction, saltation and suspension.
- Credit relevant labelled/annotated diagrams as part of the explanation of processes and the sequence of spit formation.
- Where there is a break in the coastline and a slight drop in energy, longshore drift will deposit material at a faster rate than it can be removed and gradually a ridge is built up, projecting outwards into the sea - this continues to grow by the process of longshore drift and the deposition of material. A change in prevailing wind direction, or wave refraction, often causes the end of spits to become hooked (also known as a recurved lateral).

		• Water is trapped behind the spit, creating a low energy zone, as the water begins to stagnate, mud and marshland begins to develop behind the spit. • Spits may continue to grow until deposition can no longer occur, for example due to increased depth, or the spit begins to cross the mouth of a river and the water removes the material faster than it can deposited – preventing further build-up. • Credit reference to Figures 10 and 11 if linked to formation of spit. There is an area of relatively shallow and sheltered water where there is a change in the direction of the coast. Material derived from the cliffs to the south may have been transported northwards by longshore drift. As the spit grows across the river estuary, the length of the spit has been restricted by the river outlet washing sediment away. At various times, a short term change in wind direction may have resulted in a change in the direction of the spit, forming a curved end. A salt marsh has formed in the sheltered, low energy zone behind the spit. • Sequence of spit formation and some reference to processes involved required to access Level 2. AO1 – 2 marks AO2 – 2 marks	

03	7		6

Level	Marks	Description
3 (Detailed)	5-6	AO2 Shows thorough geographical understanding of hard engineering strategies used to protect the coastline. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in making a well-supported judgement about the issues and reaching a conclusion.
2 (Clear)	3-4	AO2 Shows some geographical understanding of hard engineering strategy (ies) used to protect the coastline. AO3 Demonstrates reasonable application of knowledge and understanding in making a judgement about the issues and reaching a conclusion
1 (Basic)	1-2	AO2 Shows limited geographical understanding of hard engineering strategies used to protect the coastline. AO3 May include limited application of knowledge and understanding in making a judgement about the issues and/or reach a conclusion.
	0	No relevant content

- Level 3 will be developed responses, with supporting evidence for answer, which might be balanced or based on definite decision. Appropriate terminology will be used throughout and the answer reaches a conclusion.
- Level 2 will have linked statements showing understanding of strategy (ies) and their effectiveness. Answers may be balanced or based on definite decision. Some geographical terminology evident.
- Level 1 will be simple statements with limited understanding or development. May consist of listed points or random statements about hard engineering strategies.

Indicative content

- Responses will apply knowledge and understanding of hard engineering strategies used in coastal environments, making a judgement about their effectiveness in protecting the coast from further erosion.
- The command is ‘explain your answer’, so responses should attempt substantiate the choice made. However credit responses which highlight one side of the argument, as well as those which take a more balanced approach before reaching a conclusion. There is no “correct” view-both sides can be credited, if supported with evidence.
- Understanding of hard engineering, which involves using artificial structures to control natural processes. These are designed to reduce wave energy or create a barrier between the land and sea, so storm waves can’t reach the cliffs.
- Strategies listed in the specification are sea walls, rock armour (rip-rap),

		gabions and groynes, but accept reference to other strategies such as revetments, tetrapods, offshore breakwaters, tidal barriers. • Sea walls are long used and with proven effectiveness. They absorb and deflect wave energy back to sea. Recurved upper lips dampen down oncoming wave power. However they are expensive to construct and require regular repair. Erosion at the base can undermine sea wall foundations. They can cause down current scarring, where waves cause more damage to unprotected areas. • Rip rap/rock armour consists of massive blocks of natural rock placed in position and piled up at the base of a cliff. They require less maintenance than a sea wall. If resistant rocks like granite are used they are barely eroded even under highest energy conditions. However they are expensive to extract, transport and place in position, (although less expensive than sea walls). • Gabions are rock-filled wire cages placed along a vulnerable coast. They are cheaper than sea walls and flexible in design. They can absorb the pounding of wave energy. They can also improve drainage of cliffs and may eventually become vegetated and merge into the landscape. However after a few years they rust and can break apart under effect of heavy seas, therefore requiring regular repair and maintenance. • Groynes are wooden or rock structures at right angles to a beach extending into the sea designed to capture longshore drift sediments. They are effective at increasing a natural barrier of beach between sea and shore, and can create calmer inshore water. However they require maintenance and repair and speed up downcoast erosion by robbing adjacent beaches of sand. The problem is therefore shifted, not solved. • Credit concerns about using hard engineering techniques to protect the coast that go beyond cost and local effectiveness. They may interrupt natural systems more widely. Protection for some groups at one location is often at the expense of other groups further along the coast. • Recent attempts to manage coastal processes have focussed on more sustainable strategies, considering the whole coastal zone. Hard engineering becomes just one of several strategies as part of shoreline management plans or integrated management. • No credit for soft engineering, apart from comparative statements - soft engineering options are often less expensive than hard engineering options. They are usually more long-term and sustainable, with less impact on the environment. • Credit named examples if relevant. Eg Mappleton coastal management scheme involved two types of hard engineering - placing rock armour along the base of the cliff and building two rock groynes. Mappleton and the cliffs are no longer at great risk from erosion. The rock groynes have stopped beach material being moved south from Mappleton along the coast. However, this has increased erosion south of Mappleton. • Conclusion may emphasise that hard engineering can be a very effective	

		way of preventing erosion in developed areas when used appropriately. However some hard engineering defences like groynes can cause problems for areas down the coast lacking coastal protection. • Explanation of two or more strategies is required for access to L3. AO2 – 3 marks AO3 – 3 marks	

04	1	One mark for the correct answer: B. 516977 No credit if two or more answers shaded. AO4 – 1 mark	1

04	2	One mark for the correct answer: C. 5101 No credit if two or more answers shaded. AO4 – 1 mark	1

04	3	One mark for the correct answer: A. 517985 No credit if two or more answers shaded. AO4 – 1 mark	1

04	4	One mark for brief outline or description of one feature of the river mouth. Eg There is much deposition of sediment/a small delta has formed The river cuts through the beach material. The river becomes narrower/straighter just before reaching the sea Accept any valid description No credit for reference to human features such as groynes or housing. No credit for wave processes/beach features. AO4 – 1 mark	

04	5	The answer requires application of knowledge and understanding to photographic and/or map evidence. Answers must suggest a reason for the additional straightened channel. Accept plausible suggestions. Eg The extra channel is a flood relief channel (1) It may have been built to take away surplus water from the drainage basin to the sea/or to reduce flooding upstream (1) The straight channel speeds up water flow, so reduces the amount of surface water (1) It could be built to help with irrigation of the surrounding farmland (1) AO3 – 1	1

04	6		4

Level	Marks	Description
2 (Clear)	3-4	AO1 Demonstrates accurate knowledge about fluvial transport and depositional processes and floodplain formation. AO2 Shows a clear geographical understanding of the interrelationships between fluvial environments and processes. Explanations are developed.
1 (Basic)	1-2	AO1 Demonstrates some knowledge of fluvial transport and depositional processes and floodplain formation. AO2 Shows limited geographical understanding of the interrelationships between fluvial environments and processes. Explanations are partial and limited in scope.
	0	No relevant content

- Level 2 answers will contain linked statements showing some understanding of the processes involved and the correct sequence of formation. Appropriate geographical terminology. It is not necessary to explain both erosion and depositional processes to be awarded top marks.
- Level 1 will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.

Indicative content

- The command is “explain”, so responses should provide a reasoned account of how and why a floodplain forms.
- The question implies knowledge of the processes of transportation and deposition as well as a landform of fluvial deposition. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.
- Floodplains are large, flat expanses of land that form on either side of a river. The floodplain is the area that a river floods onto when water level rises above the height of the channel.
- By the time it reaches the middle/lower course the river is wider and deeper and may contain a large amount of suspended sediment.
- As the river breaks its banks friction causes sediment to be deposited, the largest material first. This requires the most energy to be transported and therefore build up around the sides of the river forming raised banks or levées. Finer material such as silt and fine clays continue to flow further over the floodplain before they are deposited.
- When floods have receded, the flood plain is slightly higher due to the deposits of silt/alluvium caused by the river flooding. A flood plain is built up over hundreds of years. Each flood makes the flood plain higher.
- Lateral (sideways) erosion widens the river channel. The river channel is also deepened. A larger river channel means there is less friction, so the water flows faster. The force of the water erodes and undercuts the river

		bank on the outside of the bend where water flow has most energy due to decreased friction. On the inside of the bend, where the river flow is slower, material is deposited, as there is more friction. Gradually meanders gradually migrate downstream, creating a floodplain. The edge of a flood plain is quite often marked by a clear slope or bluff line, which is the extent of lateral erosion by the river. • Credit relevant labelled diagrams as part of the explanation of processes and the sequence of floodplain formation. • Credit reference to Figures 12 and 13 if linked to formation of a floodplain. The flat land next to the Cuckmere River consists of silt transported downstream. Every time the river floods further material is deposited, causing the floodplain to rise a little. The river meanders a great deal, cutting into the outer bank where the water flows fastest. This widens the floodplain. On the inside bend deposition occurs and gradually the meanders migrate across the whole floodplain. • Sequence of formation and some reference to processes involved required to access Level 2. AO1 – 2 marks AO2 – 2 marks	

<table>
<tr>
<td>04</td>
<td>7</td>
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<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>5-6</td><td>AO2 Shows thorough geographical understanding of human factors affecting the risk of river flooding

AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in making a well-supported judgement about the importance of physical and/or human factors affecting flooding, and reaching a conclusion.</td></tr>
<tr><td>2 (Clear)</td><td>3-4</td><td>AO2 Shows some geographical understanding of the human factors affecting the risk of river flooding

AO3 Demonstrates reasonable application of knowledge and understanding in making a judgement about the relative importance of physical and/or human factors affecting flooding, and reaching a conclusion.</td></tr>
<tr><td>1 (Basic)</td><td>1-2</td><td>AO2 Shows limited geographical understanding of factors affecting the risk of river flooding

AO3 May include limited application of knowledge and understanding in making a judgement about importance of physical and human factors affecting flooding, and/or reach a conclusion.</td></tr>
</table>

• Level 3 will be developed responses, with supporting evidence for answer. Answers may be balanced or based on definite decision. Appropriate terminology will be used throughout and the answer reaches a conclusion.

• Level 2 will have linked statements showing understanding of physical and/or human factors. Answers may be balanced or based on definite decision. Some geographical terminology evident.

• Level 1 will be simple statements with limited understanding or development. May consist of listed points or random statements about physical and/or human factors.

Indicative content

• Responses will apply knowledge and understanding of human and physical factors affecting flooding, making a judgement about the significance of human factors.

• The command word is ‘explain your answer’, so answers should reach a conclusion and substantiate the choice made. Credit responses which highlight one side of the argument, as well as those which take a more balanced approach before reaching a conclusion. There is no “correct” view-both sides can be credited, if supported with evidence, although it is likely that many responses will agree with the statement.

• Factors listed in the specification are precipitation, geology, relief and land use, but credit other factors such as snowmelt, levels of previous saturation, vegetation, soil type, obstacles such as bridges, and river management such as dams.
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		• Impermeable rocks (eg granite) and soil (eg clay) will not allow water to pass through, resulting in large amounts of surface runoff and a greater flood risk. • A drainage basin with a steep gradient will result in greater overland flow and higher flood risk than where the gradient is less steep, allowing more time for infiltration to occur. • Type, intensity, duration and amount of precipitation: eg heavy rain results in rapid saturation of the upper soil layers and the excess water therefore reaches streams quickly as surface runoff and increases food risk • Vegetated areas help to reduce flood risk by increasing the time it takes for water to reach a river (longer lag time) by encouraging infiltration (roots opening up the soil), intercepting water by their leaves and taking up water in their roots. • Land use and human Impact: man made surfaces such as concrete and tarmac are impermeable, therefore rivers in urban drainage basins tend to have short lag times due to higher amounts of surface runoff and drainage systems taking water to rivers quickly. Sloping roofs, guttering and underground drainage systems transfer water very quickly to rivers. The increase of house building in towns and villages, especially on river flood-plains has meant that rivers respond more quickly to storms and flood risk is therefore greater. • Deforestation may increase flood risk as interception and infiltration are reduced and runoff increases. Agricultural practices – such as ploughing up and down slopes can raise flood potential. Local flood management schemes such as channelisation that take water away from one area faster. • Credit examples where relevant, but these are not essential to gain max marks. • Evaluation of importance of human and/or physical factors may emphasise that precipitation is the primary factor in most floods, although its impact depends on several aspects such as intensity and duration. Flood risk is much more complex, and is affected by a combination of human and physical factors. • Some floods may be more affected by human factors than others- depending on proportion of built up area, level of tree cover, farming practices, artificial drainage. Many examples of floods where flood levels much higher as a result of human activity, others where physical factors dominant eg Boscastle- Heavy localised rainfall, saturated ground from previous rainfall, topography of the land, narrow river channels in the village itself. AO2 – 3 marks AO3 – 3 marks	

05	1	One mark for the correct answer: D. ribbon lake No credit if two or more answers shaded. AO4 – 1 mark	1

05	2	One mark for the correct answer: B. 751 metres No credit if two or more answers shaded. AO4 – 1 mark	1

05	3	One mark for the correct answer: D. south east-north west No credit if two or more answers shaded. AO4 – 1 mark	1

05	4	One mark for the correct answer: A. Mellbreak No credit if two or more answers shaded. AO4 – 1 mark	1

05	5	The answer requires application of knowledge and understanding to photographic and/or map evidence. Answers must suggest a reason for the area of flat land. Accept plausible suggestions. Eg Streams from the surrounding hills/mountains may have deposited material, separating the two lakes (1) Glacial moraine/till/outwash may have been deposited here (1) It may be an area of fertile land reclaimed for farming (1) Accept idea of varying resistance of valley floor, so some areas eroded more than others (1) AO3 – 1	1

05	6		4

Level	Marks	Description
2 (Clear)	3-4	AO1 Demonstrates accurate knowledge about glacial erosion and depositional processes and glacial trough formation. AO2 Shows a clear geographical understanding of the interrelationships between glacial environments and processes. Explanations are developed.
1 (Basic)	1-2	AO1 Demonstrates some knowledge of glacial erosion processes and glacial trough formation. AO2 Shows limited geographical understanding of the interrelationships between glacial environments and processes. Explanations are partial and limited in scope.
	0	No relevant content

- Level 2 answers will contain linked statements showing understanding of the processes involved and the correct sequence of formation. Appropriate geographical terminology.

- Level 1 will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.

Indicative content

- The command is “explain”, so responses should provide a reasoned account of how and why a glacial trough forms.

- The question implies knowledge of the processes of erosion as well as a landform of glacial erosion. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.

- Ice occupies a former river valley, often V shaped. The glacier is fed by several tributary glaciers that start in corries. These join together and cause the ice to erode powerfully.

- Processes include abrasion-where moraine within the ice to the sides has a sandpapering effect on both sides and base, and plucking- where the ice following melting under pressure, freezes to the rock and tears part of it away when it moves.

- The valley is widened and deepened and the cross profile becomes a steep sided trough with broad base and steep valley sides (U shaped valley). The ice removes the interlocking spurs of the former river valley.

- After the ice melts, the valley floor is filled with glacial debris and river deposits. In places there may be ribbon lakes where water fills hollows.

- Credit relevant labelled diagrams as part of the explanation of processes and the sequence of glacial trough formation.

- Credit reference to Figures 14 and 15 if linked to formation of a glacial trough. Small tributary glaciers started high in the mountain and fed into the main trunk glacier. This valley glacier moved south east to north west

		across the area and carved out a steep sided valley, with a flat floor. Glacial erosion removed obstacles and created a fairly straight valley. After the ice retreated the valley floor was filled with glacial and river sediment and where the valley floor was deeper water filled the hollows forming ribbon lakes such as Crummock Water and Buttermere. • Sequence of formation and some reference to processes involved required to access Level 2. AO1 – 2 marks AO2 – 2 marks	

05	7	Level	Marks	Description	6
		3 (Detailed)	5-6	AO2 Shows thorough geographical understanding of economic activities and land use conflicts in glaciated areas AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in making a well-supported judgement about the issues of conflict in glaciated areas, and reaching a conclusion.	
		2 (Clear)	3-4	AO2 Shows some geographical understanding of economic activities and land use conflicts in glaciated areas AO3 Demonstrates reasonable application of knowledge and understanding in making a judgement about the issues of conflict in glaciated areas, and reaching a conclusion.	
		1 (Basic)	1-2	AO2 Shows limited geographical understanding of economic activities and land use conflicts in glaciated areas AO3 May include limited application of knowledge and understanding in making a judgement about the issues of conflict in glaciated areas, and/or reach a conclusion.	
		• Level 3 will be developed responses, with supporting evidence for answer. Answers may be balanced or based on definite decision. Appropriate terminology will be used throughout and the answer reaches a conclusion. • Level 2 will have linked statements showing understanding of land use conflict(s) caused by economic activity. Answers may be balanced or based on definite decision. Some geographical terminology evident. • Level 1 will be simple statements with limited understanding or development. May consist of listed points or random statements about economic activities. **Indicative content** • Responses will apply knowledge and understanding of the effect of different types of economic activity in glaciated areas, making a judgement about whether it leads to land use conflict.			

		• The command word is 'explain your answer', so answers should reach a conclusion and substantiate the choice made. Credit responses which highlight one side of the argument, as well as those which take a more balanced approach before reaching a conclusion. There is no "correct" view-both sides can be credited, if supported with evidence, although it is likely that most responses will agree with the statement. • Economic activities listed in the specification are tourism, farming, forestry and quarrying. Allow other types, including hydro-electric power/wind/renewable energy. • Conflicts between tourism and other activities. Some people fear interference with their livelihoods (eg farmers), or congestion and pollution from cars and litter. Too much recreational activity may damage fragile environments (eg soil erosion can interfere with flora and fauna). Tourists could leave gates open whilst walking and exploring the area. This can lead to animals escaping and potentially being injured or lost. This would affect profits for the farmer. Purchase of second homes, used sporadically, reduces chances of property availability for locals and limits use of local services. Ageing population (schools shut down). • Some conflicts between tourists and other tourists eg Lake District conflicts between open water swimmers, large sailing boats and water skiers. Speed limit on Windermere introduced in 2005 (10 mph). • Conflicts between water companies and other land uses. Damming has a major impact on local environments. Flooding valleys and altering the course of rivers prevents the landscape being used by farmers, tourists and wildlife and affects the water cycle. Dams and electricity pylons are considered by tourists to spoil the landscape. • Wind farms may spoil landscape, which affects number of tourists staying in hotels/visiting area. House prices may fall if views spoilt. Much local opposition on environmental and aesthetic grounds. • Conflicts between forestry and other land uses. Heavy trucks used to transport the logs can cause traffic congestion on roads and increases journey times. Logging can cause noise pollution which disrupts the peace and quiet of the area and can scare away wildlife. It can scar the landscape and make it look unsightly. Growing foreign trees in rows or lines looks out of place and destroys the natural beauty of the area. After the forest has been cut down, there is no vegetation left to intercept rainfall. Machinery used by the loggers compacts the soil so water cannot soak in. This can result in localised flooding. • Conflicts between quarrying and other land uses. Quarrying may lead to pollution of land and rivers and spoil the landscape. • Credit named examples of land use conflicts, eg Glenridding zip wire proposal (dropped after opposition). Kirkby Moor. Much recent opposition to expansion of wind farms, with suggested new turbines 3 times as high, forcing rejection of planning proposal. • Evaluation of statement, eg economic development in upland glaciated	

		areas can lead to significant conflicts of interest, particularly between tourism and other land users, and forestry and other land users. Some activities are less intrusive than others. Many locals prepared to accept developments, and overlook disadvantages, if they bring employment and revenue to the area. Interest groups have different views. Conflicts do exist, but many are confined to small areas. AO2 – 3 marks AO3 – 3 marks	

23 January 2018