DRAFT SPECIMEN MATERIAL

A-level
GEOGRAPHY

PAPER 1

Mark scheme

Sample assessment materials

V0.1

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 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.

Qu	Part	Marking guidance	Total marks

Section A Water and carbon cycles

01	1	**Which sentence describes one impact of climate change upon global precipitation rates?** B	1 **AO1=1**

01	2	**Which terms apply to land-based transfers of water?** D	1 **AO1=1**

01	3	**To what does the carbon budget refer?** B	1 **AO1=1**

02	1	**Using Figure 1, describe and comment on the effect of human activities on the carbon cycle.** <u>Mark scheme</u> **Level 2** (4–6 marks) Clear use of **Figure 1** to summarise the data. Application of knowledge of the activities in **Figure 1** which affect the carbon cycle, in terms of both stores and processes (flows). Comment shows analysis and interpretation using the figure as the basis. Also links to the impact of the activity upon the cycle. Use of the figure adds to the quality of the comment. **Level 1** (1–3 marks) Basic use of **Figure 1** to summarise the data. Application of knowledge of some activities in **Figure 1** which affect either the stores or flows of carbon. Likely to show less knowledge of the flows of carbon. Comment on the way in which the activity is affecting the carbon cycle is likely to be basic, offering limited analysis and interpretation. Heavily lifts from the figure and may be partial or unbalanced. <u>Notes for answers</u> The carbon cycle is a dynamic relationship which is essentially concerned with the storage and movement of carbon between air, water and land. This means that some of the carbon is moved either naturally or due to human activity. These are the processes, transfers or flows. Increasing carbon in the atmosphere (in the form of CO_2) is considered to be a principal factor affecting climate change. Many human activities are considered to be unbalancing the natural stores and flows of carbon between the water, air and land. Mining and burning fossil fuels is one major factor which is known to release very	6 **AO2=2** **AO3=4**

		large quantities of carbon back into the atmosphere from previously stored materials. Others may consider farming practices which have an impact on the vegetation and respiration processes contained within the figure. More sophisticated responses may consider the impact of fishing and other marine activities in reducing the carbon stores. Expect to see extensive use of the resource, including manipulation of data.	

02	2	**Explain how natural factors are responsible for changes in the magnitude of carbon stores.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed knowledge and understanding of the factors affecting movement of carbon around the cycle. Detailed application of knowledge of the physical factors with possible reference to examples, which may consider range of scales. Detailed understanding of factors which change the size of the stores. Analysis, interpretation and/or evaluation evident. May consider context beyond the scope of the specification. **Level 2** (4–6 marks) Clear knowledge and understanding of the factors affecting the movement of carbon around the cycle, though may be incomplete. Clear breadth of physical factors and understanding of the factors which change the size of the carbon store. Analysis and interpretation emerges. **Level 1** (1–3 marks) Basic knowledge and understanding of the factors affecting the movement of carbon around the cycle. Offers limited breadth. Simplistic understanding of the factors which change the size of a carbon store. Limited or no analysis and interpretation. <u>Notes for answers</u> Carbon is stored underground, in living plants and animals, in the oceans and in the atmosphere. Natural processes will affect these carbon stores. Geologically, carbon stores accumulate when plants/animals die and decay. Over long periods the remains become fossilised and are stored within rock. This also happens under water with the decay of marine flora and fauna. Natural processes such as erosion, natural fire, volcanic eruption and respiration will transfer carbon around the cycle. These changes affect the magnitude of the stores but also increase the transfers between one store (underground or in living matter) to another (mainly to the atmosphere in the form of CO_2).	9 **AO1=4** **AO2=5**

02	3	**Analyse the relationship between the water cycle and carbon cycle.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed knowledge and understanding of the relationship between water and carbon cycles, which should consider a range of scales. Uses specific processes to highlight the link between the two cycles with detailed analysis and interpretation. Appropriate terminology used to examine the relationship. **Level 2** (4–6 marks) Clear knowledge and understanding of the relationship between water and carbon cycling which may consider range of scales. May use specific processes affecting stores and transfers to highlight the link between the two cycles, but this is partial. Offers clear evidence of analysis and interpretation. Some use of appropriate terminology. **Level 1** (1–3 marks) Basic knowledge and understanding of the relationship between carbon and water. May drift into description of the water cycle and the carbon cycle with only implicit connection between the two cycles. <u>Notes for answers</u> This refers to the cycling of water and carbon between the abiotic and biotic components of the lithosphere, biosphere, atmosphere and hydrosphere. The water cycle supports the carbon cycle. For example, overland flow is responsible for almost all of the transport of eroded biotic matter from land to water bodies. Carbon cycle processes such as respiration, photosynthesis and decay all take place in the presence of water and rely on water in the transfer of carbon into different states. Responses may offer specific examples showing how carbon is cycled in the presence of water and/or via the action of water. This is a valid approach.	9 **AO1=4** **AO2=5**

Section B

Question 3 Hot desert environments and their margins

03	1	**Why are some rivers in hot deserts ephemeral?** B	1 **AO1=1**

03	2	**Wind has a direct impact on the development of which erosional landforms?** C	1 **AO1=1**

03	3	**Which of the following is a cause of desertification?** C	1 **AO1=1**

03	4	**Using Figure 2, describe and comment on the interaction between climate, soils and vegetation.** <u>Mark scheme</u> **Level 2** (4–6 marks) Clear knowledge and understanding of the link between climate vegetation and soils. Knowledge and understanding applied to the creation of this landscape with explicit use of the resource to support. Appropriate use of terminology and specific subject knowledge evident. **Level 1** (1–3 marks) Basic awareness of the climate and vegetation of desert areas. Limited understanding of soil formation or the link between the three elements. Limited use of the figure. <u>Notes for answers</u> The decisive factor is the climate. Hot deserts experience very high temperatures for most of the year during day time, but also, during night time, very low temperatures. Precipitation levels are very low in desert areas, with occasional downpours which lead to flash floods or intermittent periods of low rainfall (depending upon location). Weathering is mainly undertaken by mechanical processes, though water also plays a part. Soil formation is basic and limited due to the lack of vegetation, net primary productivity and limited decay (due to lack of fauna). Only basic thin shallow soils are formed. Vegetation which can survive is highly adapted to the environment. Expect to see reference to the characteristics of the saguaro cactus and named surrounding vegetation. The landscape created is one of low-density vegetation with species highly adapted to the climate and soils.	6 **AO2=2** **AO3=4**

03	5	**Account for the distribution of hot deserts.** Mark scheme **Level 3** (7–9 Marks) Detailed knowledge and understanding of the factors affecting the distribution of hot deserts. Detailed account which may include links to human activity and climate change. Expect to see knowledge and understanding of places, concepts and processes which is linked to factors. **Level 2** (4–6 marks) Clear knowledge and understanding of the factors affecting the distribution of hot deserts. Reasons are more sophisticated and some understanding of place, concept and process emerges. Likely to be partial or incomplete. **Level 1** (1–3 marks) Basic knowledge and understanding of the location of hot deserts. Reasons likely to relate to basic causes of aridity. Notes for answers Responses should show awareness of the general locations of the global distribution of hot deserts and common characteristics such as latitude and continentality. Expect to see place reference for the major areas of desert as well as any anomalies. In accounting for the distribution of hot deserts, reasons should relate the likely causes of aridity in these places. Climate change and human activity may also feature in responses which consider the process of desertification.	9 **AO1=4** **AO2=5**

03	6	**Discuss the role of wind in the formation of hot desert landscapes.** Mark scheme **Level 3** (7–9 marks) Detailed knowledge and understanding of the role of wind. Detailed analysis of the link between wind and subsequent landforms or landscapes. Discusses wind processes and how these shape the land through erosion, transport and/or deposition. Discussion evident by considering links to other agents such as water. Place emerges and may consider a range of scales through contrast between landform and landscape. **Level 2** (4–6 marks) Clear knowledge and understanding of the role of wind. Clear application of knowledge in the link between wind and subsequent landforms or landscapes, though may contain minor error or omission. Discussion of some wind processes and how these shape the land through erosion, transport and/or deposition. Place names may feature, though more likely to focus upon landform and not landscape.	9 **AO1=4** **AO2=5**

		Level 1 (1–3 marks) Basic understanding of the role of wind. Limited awareness of the link between wind and subsequent landforms or landscapes. May describe some wind processes. Little or no discussion. <u>Notes for answers</u> There are a variety of ways of approaching this question. Some may choose to cover erosion, transport or depositional process and their subsequent impact upon landscapes. Others may choose to cover all three in less detail and instead consider the overall impact of wind. For erosion expect to see reference to how wind abrasional processes shape and scour the land. Yandangs and zeugen are likely to feature. For transport, expect to see reference to deflation hollows, and these are likely to be linked with creation of dunes. For deposition, dune formations are likely to be considered. Some may consider the role of water as part of the discussion.	

Question 4 Coastal systems and landscapes

04	1	**Which of the following describes sediment budget?** C	1 **AO1=1**

04	2	**Where do erosional coastal landscapes tend to develop?** C	1 **AO1=1**

04	3	**Where do sand dunes tend to form?** D	1 **AO1=1**

04	4	**Using Figure 3, describe and comment on the likely issues associated with managing flood risk in the area shown.** <u>Mark scheme</u> **Level 2** (4–6 marks) Description shows clear knowledge and understanding of the issues associated with managing flooding. The resource is used appropriately with clear engagement with map evidence. Clearly focused upon appropriate issues. Comment on the issues is logical and shows evidence of interpretation and analysis. There may be some evaluation. **Level 1** (1–3 marks) May only develop one issue. Description shows basic knowledge and understanding of the issues associated with managing flooding. Considers valid issues but only at a superficial level. Limited comment and predominantly descriptive. <u>Notes for answers</u> One issue is the scale of the area. The area at risk of flooding is extensive and affects both the estuary itself and the inland waterways. Expect to see comment around the problems of trying to protect such a vast area and the costs associated with undertaking such work. There should be reference to the map and the extent of the area at risk in the estuary itself but also areas to the north and west in particular. Choosing which areas to prioritise will be a major issue for planners and managers. The cost of maintaining existing defences, particularly where damage occurs due to previous breaching, is another potential issue. Some may consider the costs and benefits of hard versus soft engineering strategies. Another issue is related to the settlements in the areas susceptible to flooding. Hull, Immingham and Grimsby may be referred to. Depending on the scale of the flooding, some may refer to issues associated with protecting properties and costs of repair and rebuild. Others may refer	6 **AO2=2** **AO3=4**

		to the health and safety implications of extensive flooding. Expect comment in relation to risk to life and well-being. Another approach may be to focus on early warning and communication systems and evacuation plans. Extensive planning would be needed to ensure all local people can be moved in short periods of time. Disaster management plans may feature in such responses. Provided issues are appropriate to **Figure 3**, allow other approaches.	

04	5	**Explain how variations in coastal energy lead to the creation of contrasting coastal landscapes.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed knowledge and understanding of the sources of energy. Application sees the link between energy and impact upon the creation and development of high and low energy environments. Likely to link to landforms and offer detailed information on development, including place reference at a range of scales. **Level 2** (4–6 marks) Clear knowledge and understanding of the sources of energy and how these impact upon the creation and development of high and low energy environments. May link high/low energy to landform though partial and/or incomplete. **Level 1** (1–3 marks) Basic knowledge and understanding of the sources of energy with limited understanding of the link between the energy and the environment created. <u>Notes for answers</u> For energy, responses will mostly likely refer to waves, currents and tides and how these shape the coastline. High energy environments are characterised by strong winds, a large fetch, which generate strong currents and more destructive waves. These waves attack exposed coastlines, usually cliff lined, where the water is deep and the waves can attack unimpeded by shallow water. Expect to see reference to geos, arches, stacks and stumps as characteristic landforms created in these environments. Low energy environments are characterised by low wind speeds or calm conditions in sheltered environments. Waters tend to be shallow and constructive waves dominate. The swash is more powerful than backwash and sediments are pushed up the beaches in bays. Expect to see reference to beaches and bays. Named high energy coastlines are likely to support responses.	9 **AO1=4** **AO2=5**

04	6	**Account for the landforms created as a result of eustatic sea level change.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed analysis and interpretation of the factors leading to the formation of more than one landform. Detailed knowledge and understanding of both characteristics and factors leading to the formation. Likely to offer detailed place reference. **Level 2** (4–6 marks) Considers more than one landform with clarity. Accounts for the formation of the landforms clearly. May still be minor error or omission. May offer clear place reference. **Level 1** (1–3 marks) Able to refer to a named landform in only basic terms. May be error or omission in accounting for how the features were created. May only consider one landform. <u>Notes for answers</u> Essentially landforms such as fjords are a result of a combination of processes. Historical glacial erosion had carved out large glacial troughs, and these have extended towards the coastline in places such as Norway. As temperatures have increased in the intervening inter-glacial period, the ice has melted. This has combined with an increase in sea level caused by thermal expansion and the release of the stored water back into the hydrological cycle. Places such as Sogne Fjord are good examples of such extensive coastal features, which may extend up to 200 km inland. Other may consider rias, which are drowned river valleys created in a similar way to fjords. These river valleys were eroded at a time when the sea level was lower. As sea levels have risen these winding and sheltered inlets have been formed. Dalmation coasts can be considered a similar feature but with river valleys flooded parallel to the coast and not perpendicular. Others may consider landform emergence such as raised beaches. This is an equally creditworthy approach.	9 **AO1=4** **AO2=5**

Section C

Question 5 Hazards

05	1	**In the context of natural hazards, what is meant by the term fatalism?** One mark per valid point made with additional credit for developed points, eg Fatalism is a perspective on life which suggests that humans cannot influence or shape outcomes of future events. In this sense there is a perception that in a disaster, there is nothing that one can do to mitigate against it. Such people tend to take limited preventative measures despite living in an area known to be prone to such hazards. There is a degree of resignation in relation to the outcome of hazardous events.	3 **AO1=3**

05	2	**Comment on the extent to which Figure 4 provides evidence of the cause of seismicity.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed knowledge and understanding of the causes of seismicity are evident. This is applied to **Figure 4**. Appropriate analysis and interpretation feature throughout. Detailed place knowledge and scale is evident. Evaluation through an understanding of the limitations of the resource. Appropriate conclusions are drawn. **Level 2** (4–6 marks) Clear knowledge and understanding of the causes of seismicity. May be partial or incomplete. Some analysis and interpretation of **Figure 4** and evidence it provides. Place knowledge may emerge. Tentative evaluation with clear conclusions drawn. **Level 1** (1–3 marks) Basic knowledge and understanding of the causes of seismicity. Error or significant omission at the bottom end. Basic use of **Figure 4** with simplistic statements derived from the data presented. Tentative links to the causes of seismicity which do not extend much beyond the resource. <u>Notes for answers</u> **Figure 4** provides some partial evidence for the cause of seismicity. Responses should recognise that the image shows sea floor spreading, with the youngest rocks near the centre of many plate boundaries. Expect to see place knowledge in stronger responses which may refer to the Mid-Atlantic Ridge or named plates in support of their response.	9 **AO2=3** **AO3=6**

		Responses should also use accurate data derived from **Figure 4** in support. This should open up responses to explore processes associated with plate tectonics, such as convection currents which drive plate movement. Some may go further and consider particular types of plate boundary such as constructive. The evidence is partial because it relates to sea floor age, so all of the land-based seismicity is left unexplored. Evidence to support land-based destructive plate margins or collision boundaries is not provided. Some may go further to consider other evidence for plate tectonic theory which is known but not provided in the resource. Provided this leads to the cause of seismicity, this is a valid approach. Some may even consider potential human causes of seismicity such as fracking. Again this data is not provided but may be used to support a response.	

05	3	**Discuss how well the hazards associated with tropical storms can be managed.** <u>Mark scheme</u> **Please refer to grid on page 22.** <u>Notes for answers</u> There are a variety of approaches that the candidates could take in response to this question. Management at different time scales: • short term: eg prediction, warning, evacuation • medium term: eg relief efforts, initial recovery aiming for normality • longer term: eg revised management plans aiming to prevent repetition, rebuilding and improving systems of prediction and protection, investment to restore/improve normality. Expect to see references to hurricanes/tropical storms/cyclones in a variety of settings such as the USA and Indian subcontinent. Hazard-resistant design: this focuses on protection against both the storm surge and wind hazards. The storm surge hazard can be reduced by engineering structures such as sea walls, breakwaters, flood barriers and levées. Levée failure was a major cause of the flooding in New Orleans during Hurricane Katrina. Building design can protect against the storm surge by raising the building on stilts, and by using concrete or brick rather than wood or straw, which can be more easily swept away. Building design can do much to reduce the wind hazard. Prediction and warning: coastal areas at risk of flooding are protected by warning systems. These aim to monitor tropical cyclone development and forecast their intensity and tracks so that the population can prepare themselves by moving to shelters or by evacuating their property and moving away from the danger area temporarily. Predictions are based on models of atmospheric circulation and tracks	30 **AO1=9** **AO2=21**

		of previous hurricanes. The difficult part of the process is interpreting the data for warning purposes. If the population at risk are warned and evacuated then lives may be saved. However, if warnings prove wrong, there are high economic losses from evacuation and therefore lost production. There is also the impact on the population in terms of their reaction to future warnings. Too many erroneous warnings may produce complacency, and warnings must be issued in a way which will not cause panic. Community preparedness: If warnings are to be effective, the authorities and public must be aware of the specific actions to take. Dissemination of information to the public and evacuation procedures need to be planned in advance. Land use planning: This is most effective in the coastal zone most at risk from storm surges. Past tropical cyclone data and coastal topography can be used to identify areas at high risk. The aim is to limit development in these areas to uses more compatible with flooding such as beaches and parkland. This is a difficult aim to achieve. Modifying the loss: Aid. Hurricanes often result in state and international aid provision in terms of cash and technical help, for example to restore power supplies. Insurance: This is an important management strategy, especially in wealthier countries. The availability of insurance cover may also encourage people to locate in high-risk areas and the refusal to offer insurance at a reasonable premium would assist land use planning approaches to reducing the risk.	

Question 6 Ecosystems under stress

06	1	**Outline the meaning of the term plagioclimax.** One mark per valid point made with additional credit for developed points, eg Plagioclimax refers to human interference in natural seral stage development. The human interference leads to an alternative outcome from climatic climax. Heather moorland is a good example of human activity creating a completely different climax, managed in the case for economic activity. Should the human interference stop, the normal seral stage development towards climatic climax would resume.	3 **AO1=3**

06	2	**With reference to any two biomes shown in Figure 5, compare the climate characteristics and account for the differences in natural vegetation.** <u>Mark scheme</u> **Level 3** (7–9 marks) A detailed understanding of **Figure 5**. Data is used effectively to compare the two climates. There may be manipulation of data. Climate knowledge is applied to the two biomes with accuracy and detailed understanding. Detailed analysis and interpretation, which draws appropriate conclusions in accounting for the differences. **Level 2** (4–6 marks) A clear understanding of **Figure 5**. Data is used superficially to compare the two climates. May be some omission. Climate knowledge is applied to the understanding of the two biomes. Analysis and/or interpretation emerges, which draws appropriate conclusions in accounting for the differences. **Level 1** (1–3 marks) Basic understanding of **Figure 5**. Some data is used to compare the two climates, though error and omission are evident. Basic climate knowledge is applied to the two biomes. Descriptive style, which may partially account for the differences. <u>Notes for answers</u> The response will depend upon the choice of biomes. For example: temperate seasonal forest versus tropical rainforest. These biomes are found in markedly different climatic conditions. Temperate seasonal forest is found in average temperatures from around 5–20 °C. Precipitation rates range from 30 to 230 cm per year. Tropical rainforest, by contrast, is found in places of much higher temperatures (20–30 °C) and higher rainfall (230–430 cm per year).	9 **AO2=3** **AO3=6**

		Expect to see some manipulation of data as part of comparison. In accounting for the contrasting vegetation, there are a variety of ways of approaching this. Expect responses to show an understanding of the impact of climate upon vegetation as well as other factors which will affect the vegetation, such as geographical location, which affects seasonal change. Some may also consider other factors such as continentality and altitude and how this affects climate and in turn vegetation type. Soils may also form part of more sophisticated discussions which make the link between climate and vegetation. This is a valid approach.	

06	3	**Evaluate the relationships between human activity, biodiversity and sustainability in ecosystems.** <u>Mark scheme</u> **Please refer to grid on page 22.** <u>Notes for answers</u> The response depends upon the chosen biomes. Responses may start with definitions of sustainability or sustainable development. For the equatorial rainforest there should be an exploration of issues which are hindering sustainability. This would constitute human activities which are having a detrimental effect upon the biome, leading to degradation of vegetation, habitat, soil and localised climate change. Some examples include: • farming practices such as ranching and plantation farming • settlement development • mining and mineral exploitation • transport, and particularly road building. The best responses should offer detailed location support of actual projects in specific places. In each case there should be examination of the extent to which these development activities are sustainable. Expect most to conclude that historically these practices have led to the following issues: • widespread deforestation and habitat loss • loss of flora and fauna, leading to species loss • leaching of soils – its causes and subsequent impact on regrowth of vegetation • impact on river systems – silting up and flooding • impact of mining upon local areas, including pollution and disenfranchisement suffered by local people • climate change caused by the reduction in convection rainfall and the temperature changes as a result of canopy loss. Responses should counterbalance this with attempts to create opportunities for sustainable development. Such responses should acknowledge that it is inevitable that rainforest environments will	30 **AO1=9** **AO2=21**

		continue to be exploited for their potential for economic gain, particularly in the face of a growing population: • creation of reservations free from development • eco-tourism and its potential to generate income and conserve landscapes • sustainable agricultural practices, eg the mucuna bean • sustainable energy projects • afforestation projects. The best responses should consider specific examples from named projects and locations where sustainable development schemes have been successful. Any reasonable view is acceptable as long as this is based upon preceding content.	

Question 7 Cold environments

07	1	**Distinguish between ablation and accumulation.** One mark per valid point made with additional credit for developed points, eg Ablation refers to the melting of a valley glacier as the snout reaches temperatures above 0 degrees centigrade. Accumulation refers to the build-up of snow and ice in a valley glacier, usually at higher altitudes where temperatures are colder. When ablation rates exceed accumulation rates, the glacier retreats or shrinks in size. Accept the same approach for sheet glaciers.	3 **AO1=3**

07	2	**Using Figure 6, describe the trends and suggest reasons for the differences between the glaciers.** <u>Mark scheme</u> **Level 3** (7–9 marks) Detailed use of **Figure 6** in order to extrapolate data, and show the differences between the three glaciers. Manipulation of data may be evident and awareness of anomaly such as Wolverine increase in mass balance. Suggested reasons show application of knowledge to previously unseen material. Analysis and interpretation are evident and reasonable conclusions are drawn through suggesting appropriate reasons. **Level 2** (4–6 marks) Clear use of **Figure 6** in order to describe the overarching trends. Shows clearly the differences between the three glaciers without the detailed support. Description of data evident but largely lifted to support interpretation. Suggested reasons show some application of knowledge to previously unseen material. Description is evident and some summary reasons provided. **Level 1** (1–3 marks) Basic use of **Figure 6**. Shows basic differences between the three glaciers though may use data to support. Suggested reasons show limited application of knowledge to previously unseen material. May offer only simplistic or no reasoning for the differences. <u>Notes for answers</u> This question requires application of knowledge to the resource as well as a clear understanding of what the resource shows. Based upon the 1965 reference year, all glaciers are experiencing a reduction in their mass balance over the period in question. There are different rates of	9 **AO2=3** **AO3=6**

		reduction. The Wolverine Glacier has seen the slowest rate of decline but is still −15 metres by 2012 compared to the reference year. It is the only glacier which experienced an increase in its mass balance above the 1965 baseline between 1980 and 1990 although even then there was fluctuation. The Gulcana Glacier has seen a steady decline to around −26 metres by 2012. The most rapid rate of decline has been the South Cascade Glacier, and this has fluctuated a lot within an overall pattern of decline. No specific knowledge of the glaciers is required in suggesting reasons for the differences. The assumption most will make is that temperature increase has caused mass balance to reduce, ie caused the glaciers to melt. The data would suggest that the Wolverine Glacier has been less influenced by temperature increases than the other glaciers. This could be for any number of reasons: • it is in higher latitudes • it is in higher altitudes • it may be in a north-facing aspect • it may be further inland and so less affected ocean currents and/or onshore winds. This list is not exhaustive. Allow any reasonable suggestion which is plausible in relation to the data provided.	

07	3	**'The impact of human activity on cold environments is greater than that of natural processes'. Discuss.** <u>Mark scheme</u> **Please refer to grid on page 22.** <u>Notes for answers</u> There are a variety of ways of approaching this question. Many will approach this question by examining a range of human activities upon cold environments and contrast this with a range of natural processes which continue to shape and change these places. Human activities are likely to focus upon: mineral exploitation/fishing/forestry/settlement activity/tourism in a variety of glacial, periglacial and alpine locations. Impacts are likely to focus upon: environmental degradation (mineral exploitation)/food chain disruption (for over fishing)/habitat loss (forestry)/pollution (settlement activity)/global warming (as a result of wider human activity) – most will argue this is the biggest threat to cold environments. Tourism may be considered as an opportunity for more sustainable human activity potentially benefitting cold environments. This will be counterbalanced with natural processes affecting and shaping glacial and periglacial landscapes. Responses should consider how glacial, fluvioglacial and periglacial	30 **AO1=9** **AO2=21**

		processes continue to shape the land over much greater time periods. Those responses which consider glacial processes are likely to link erosional/depositional processes to landforms. Fluvioglacial processes relate to the impact of the melt water in sorting sediments and creating unique landforms again over long time periods. Periglacial processes have created unique landforms and made significant changes to those locations (expect reference to associated landforms). A reasonable conclusion which some may draw is that historically natural processes have been the main driver in shaping cold environments but in recent times (the last 100 years or so), human activity has had an increasing impact on cold environments and that impact is set to grow. Global warming is likely to pose the greatest of all threats and impose the most rapid change.	

Essay marking criteria

Level/mark range	Criteria/descriptor
Level 5 **(25–30 marks)**	• Detailed knowledge of contrasting places (with a range of scales) and environments, which is consistently well integrated into the response. • Highly detailed knowledge of concepts, processes, interactions and change, used to support the development of the response. • Critical analysis, interpretation and evaluation show flair and creativity, with detailed synoptic links well integrated into the response. • Technical geographical language is used precisely, clearly and consistently throughout. • Clear and appropriate essay structure which is detailed throughout. Remains highly focused upon the theme and demands of the question throughout. • Flair and creativity permeates the response through detailed subject knowledge linked with the application of knowledge to the question posed.
Level 4 **(19–24 marks)**	• Knowledge of contrasting places (with a range of scales) and environments, which is generally detailed and relevant. • Detailed knowledge of concepts, processes and interactions and change, used to support the development of the response. • Critical analysis, interpretation and/or evaluation generally show detail and relevance. Synoptic links are appropriate with some evidence of integration. • There is a broad range of technical geographical language which is used precisely and clearly. • Clear and appropriate essay structure which is detailed throughout. Remains relevant to the theme and demands of the question throughout with evidence of the link between knowledge and the application of knowledge in different contexts.
Level 3 **(13–18 marks)**	• Knowledge of contrasting places and environments is generally clear and relevant with evidence of integration it into the response. • Knowledge of concepts, processes and interactions is clear and used to support the response. • Analysis, interpretation, and/or evaluation shows clarity and geographical understanding. Use of synoptic links is evident. • Technical geographical language is generally used clearly and appropriately. • There is a clear and appropriate essay structure with clear focus upon the theme and demands of the question.
Level 2 **(7–12 marks)**	• Knowledge of places (with a range of scales) and environments is evident with key place features emerging. • The answer shows partial but accurate knowledge of concepts, processes and interactions. • Emerging evidence of analysis, interpretation and evaluation. Basic synopticity. • Appropriate use of some technical geographical language. • Essay structure evident with focus upon the theme and demands of the question in part.
Level 1 **(1–6 marks)**	• A basic response which shows limited knowledge of places and environments. • Basic knowledge of concepts, processes, interactions and change. • Analysis, interpretation and evaluation show limited development. • Attempts made to use appropriate technical geographical language with limited success. • Limited evidence of structure.
Level 0 **(0 marks)**	• Nothing worthy of credit.

Copyright © 2015 AQA and its licensors. All rights reserved.
AQA Education (AQA) is a registered charity (registered charity number 1073334) and a company limited by guarantee registered in England and Wales (company number 3644723). Registered address: AQA, Devas Street, Manchester M15 6EX

19 May 2015