



General Certificate of Secondary Education

Geography 6031

Specification A

**GGA4 Challenge and Change in the
Natural Environment**

Mark Scheme

2007 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

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GGA4

General Guidance for A Level Geography Assistant Examiners

Quality of Written Language

As required by QCA, the marking scheme for this unit includes an overall assessment of quality of written communication. There are no discrete marks for the assessment of written communications but where questions are “Levels” marked, written communication will be assessed as one of the criteria within each level.

- Level 1:** Language is basic, descriptions and explanations are over simplified and lack clarity.
- Level 2:** Generally, accurate use of language; descriptions and explanations can be easily followed, but are not clearly expressed throughout.
- Level 3:** Accurate and appropriate use of language; descriptions and explanations are expressed with clarity throughout.

Levels marking – General Criteria

The following general criteria relate to knowledge, understanding and their critical application and the quality of written communication as outlined in the AQA Geography A subject specification. They are designed to assist examiners in determining into which band the quality of response should be placed, and should be used when assessing the level of response an answer has achieved. It is anticipated that candidates’ performances under the various dimensions will be broadly inter-related and the general guidelines for each level are as follows:

- Level 1:** An answer at this level is likely to:
- display a basic understanding of the topic;
 - make one of two points without support of appropriate exemplification or application of principle;
 - demonstrate a simplistic style of writing perhaps lacking close relation to the term of the question and unlikely to communicate complexity of subject matter;
 - lack of organisation, relevance and specialist vocabulary;
 - demonstrate deficiencies in legibility, spelling, grammar and punctuation, which detract from the clarity of meaning.
- Level 2:** An answer at this level is likely to:
- display a clear understanding of the topic;
 - make one or two points with support of appropriate exemplification and/or application of principle;
 - demonstrate a clear style of writing which clearly addresses the terms of the question;
 - demonstrate a degree of organisation and use of specialist vocabulary;
 - demonstrate sufficient legibility, and quality of spelling, grammar and punctuation to communicate meaning clearly.

Level 3: An answer at this level is likely to:

display a detailed understanding of the topic;
make several points with support of appropriate exemplification and/or application of principle;
demonstrate a sophisticated style of writing incorporating measured and qualified explanation and comment as required by the question and reflecting awareness of the complexity of subject matter and/or incompleteness/tentativeness of explanation;
demonstrate a clear sense of purpose so that the responses are seen to closely relate to the requirements of the question with confident use of specialist vocabulary;
demonstrate legibility of text, and qualities of spelling, grammar and punctuation, which contribute to complete clarity of meaning.

N.B. A perfect answer is not usually required for full marks. Clearly, it will be possible for an individual candidate to demonstrate variable performance between the levels. In such cases, the principle of best-fit should be applied. Experience suggests that the use of exemplars within this mark scheme and the discussion which takes place during the Standardisation Meeting normally provides sufficient guidance on the use of levels in marking.

Annotation of Scripts

Where an answer is marked using a levels of response scheme the examiner should annotate the script with a 'L1', 'L2' or L3 at the point where that level is thought to have been reached. The consequent mark should appear in the right-hand column. Where an answer fails to achieve Level 1, zero marks should be given.

Where answers do not require levels of response marking, each script should be annotated to show that one tick equals one mark. It is helpful if the tick can be positioned in the part of the answer, which is thought to be credit-worthy.

General

It is important to recognise that many of the answers shown within this marking scheme are only exemplars. Where possible, the range of accepted responses is indicated, but because many questions are open-ended in their nature, alternative answers may be equally credit-worthy. The degree of acceptability is clarified through the Standardisation Meeting and subsequently by telephone with the Team Leader as necessary.

Question 1 Resource – Cardiff Bay Barrage, 1:500,000 map extract.

a) What are the economic advantages of building coastal barrages?

A wide variety of reasons are appropriate, each can gather two further marks if developed and/or exemplified.

Tidal power, which has the advantage of being predictable and not reliant on the sun (but may only be suitable for “topping up” a regional supply) e.g. The Rance River plant near St-Malo. (1-3).

Flood protection (Thames Barrier and particularly in areas of very high tidal range such as Cardiff Bay) (1-3).

Economic development (Cardiff Bay) docklands regeneration, marina (1-3).

Tourist attraction (1-2). (4 marks)

b) How can coastal barrages impact on the physical environment?

Impacts include protection from storms/high tides > less coastal erosion/deposition within the barrier, therefore physical development of features is slowed or arrested. Are there implications downdrift? The raising of the landward water table – in Cardiff’s case by up to 1 metre (1-4).

Environmental impacts include the changes within ecosystems, such as mud flats for wading birds being relocated eastwards from Cardiff Bay; the development of algal blooms because of lack of water movement; preventing migration of spawning salmon; impacting on marine life, particularly shellfish change from salt to freshwater (1-3). (4 marks)

c) How far do benefits outweigh costs in building coastal defences other than barrages?

Please note that there is no credit for references to barrages.

Candidates may tackle this in a variety of ways, including hard/soft engineering and/or positive/negative effects of various strategies. There may well be credit for looking at varying time frames and demands. This could lead to a view that the late Victorian emphasis on maintaining beaches and/or protecting property through the use of groynes and sea walls is at variance with modern considerations regarding sea level rise and possible inundations. Another approach could be economic (tourism, protection of built environment etc.) and/or environmental issues (such as areas SSSIs and AONBs).

L1 Generic Descriptor (1-3)

A simplistic, one-dimensional approach, generalised with little support, referring either to costs or benefits.

L2 Generic Descriptor (4-6)

A broader approach with some support and possibly having some kind of view.

L3 Generic Descriptor (7)

A well supported answer with either breadth or depth and coming to a valid view, referring to costs and benefits. (7 marks)

Total 15 marks

Question 2

a) Distinguish between intrusive and extrusive volcanic activity.

Intrusive activity takes place beneath the earth's surface through magma, which cools slowly within the crust, forming large crystals, usually granitic rock, often cracked by large joints and makes up the larger proportion of the earth's crust.

Extrusive activity takes place on the earth's surface through lava, which cools quickly in air or water, forming small crystals, usually basaltic or andesitic rock and makes up the smaller proportion of the earth's crust.

Each mark is awarded for distinguishing between different features. This can be done by comparison (intrusive activity takes place beneath the earth's surface, whereas extrusive activity takes place on the surface) **or** comparative (intrusive magma cools slower than extrusive lava) or juxtaposition (as in the 2 paragraphs above).

Since part (b) refers specifically to features, there is no credit here for them. (4 marks)

b) Outline the differences between the intrusive features shown in Figure 2.

Differences can be explicit or implicit and can refer to size, shape, and/or orientation.

Batholith large, irregular, deep-seated mass of intrusive igneous rock, usually granite, with a surface area of more than 100 sq. km/40 sq mi.

Laccolith intruded mass of igneous rock that forces apart two strata and forms a round lens-shaped mass many times wider than thick. Can dome the surface above.

Dyke a sheet of igneous rock created by the intrusion of magma across layers of pre-existing rock and therefore is discordant, can be very deep seated, usually vertical.

Sill is igneous rock intruded between layers of rock and is concordant, usually relatively shallow.

No credit for processes.

Marking: Differences 1-4, Development 1-2. (4 marks)

c) Examine the positive impacts of volcanic activity.

Most of the positive impacts are economic in some way. Volcanic soils often are extremely fertile and thus are used for agriculture (Vesuvius, etc.). Igneous rocks are extremely durable and often used where ornamentation is required, such as headstones, building sills, doorframes and cornices. Volcanic sites are often higher than the surrounding land and provide defensive sites. (Edinburgh Castle on a volcanic plug, Bamburgh on the eastern edge of the Great Whin Sill). This leads in to tourism, directly in the form of Hawaii and indirectly in terms of historical sites (above); geothermal power is also relevant as is the creation of 'new' land. Extension of knowledge in terms of plate tectonics and/or prediction. Negative impacts may have a place when assessing how positive an impact is.

L1 Generic Descriptor (1-3)

General comment on one or two positive impacts

L2 Generic Descriptor (4-6)

Comment on two or more impacts with some support

L3 Generic Descriptor (7)

Supported and organised examination of two or more developed positive impacts and/or negative implications. (7 marks)

Total 15 marks

Question 3

a) Describe the main features of pyramidal peaks.

Angular glaciated mountain with three or more very steep sides which are usually the back walls of corries (1-3). Separated by sharp ridges known as arêtes (1-2) No credit here for examples. Credit appropriate use of photograph. No credit for explanation. (4 marks)

b) Outline the processes leading to the formation of corries.

An appropriately labelled diagram can attract credit here but do not double credit information that also appears in the text of the answer. There are many routes to full marks, as indicated below. The key word in the question is 'processes'.

Freeze-thaw loosens rock debris and is initially removed by melt-water (1-2). The nivation process (snow, firn, névé, ice) in a high, often north facing hollow, then takes place in snow lasting more than one year (1-3). The weight becomes enough for sliding and subsequently rotating motion of the ice leading to abrasion of the floor of the hollow and the development of a lip, with plucking occurring at the back (1-3).

There may be dilation of rock joints below the ice caused by pressure release (1-2).

(4 marks)

c) Discuss the environmental conflicts that occur in glaciated areas such as Snowdonia.

The question clearly refers to environmental conflicts and so bald statements of problems etc. carry little credit. There is a broad remit for 'cold environments' and examples can be taken from any such environment.

Possible content could include farmers v hikers/climbers; local people v holidaymakers (traffic, pollution etc.); developers v conservationists; industry/mining v environmental concerns; fragile environment/ecosystem v volume of recreational use and capacity of areas to cope, particularly at peak times.

L1 Generic Descriptor (1-3)

Suggests in general terms one or two problems. Only one conflict remains in L1

L2 Generic Descriptor (4-6)

Offers clear ideas on two or more conflicts, possibly with some support.

L3 Generic Descriptor (7)

Provides a supported, possibly categorised, range of appropriate conflicts.

(7 marks)

Mark Scheme for Synoptic Essays

Preamble

Examiners should bear in mind that these questions are synoptic in nature and offer candidates the opportunity to demonstrate knowledge and understanding:

1. across a range of geographical subject matter;
2. of connections between the different aspects of geography in the specification;
3. of the importance, where relevant, of human perspectives on themes and issues.

Candidates are advised of this both in the Assessment Unit Rubric and in the Note to Candidate which precedes the essay questions in Section B. Synoptic elements might therefore feature in answers matching all the criteria bands but can be expected to feature more prominently in higher mark bands. It will be seen that explicit synoptic content is a necessary feature of the two band ranges 21-27 and 28-30.

Additionally essay writing is an important vehicle for the demonstration of communication skills – at Level 3 these refer to writing in a manner appropriate to purpose and complex subject matter; organising relevant information clearly and coherently using specialist vocabulary as appropriate and ensuring clarity of meaning through legible text, accurate spelling, punctuation and grammar.

(Key Skills – Communication Level 3 C3.3 [QCA]; Para. 13 AS/A Level Geography Specification Outlines [QCA]).

Synoptic content and communication aspects should be kept in mind when assessing the unit and are incorporated into the criteria bands set out below which refer to knowledge, understanding and skills. Indicate synoptic content using the letter 's' in the margin as appropriate.

CRITERIA BANDS

Examiners will use the criteria below to evaluate the work, placing the candidate's performance in the appropriate band and attributing the mark from the left-hand column appropriate to the question concerned. They should seek the best fit from the band descriptor – work adjudged to be in a particular band might not contain all the features attributed to that band.

28 – 30

A very good answer. Consistently relevant to the theme and to the demands of the question. Evaluates explicitly where required. Displays a very confident range of knowledge and understanding by using the appropriate terminology, critically referring to concepts and theory where necessary and establishing relationships between different physical and/or human factors and processes. Synoptic elements are a prominent feature and are fully integrated into the answer and used to purposeful effect in respect of the question's requirements.

Demonstrates, where relevant, either implicitly or explicitly awareness of human perspectives upon geographical themes and issues. Argues coherently and in an organized, logical and balanced fashion. Support is consistent, accurate and detailed. A well developed essay style. Detailed and sophisticated communication skills with fluent and cogent writing style.

21 – 27

A good answer, which remains relevant to the theme and demands of the question. Evaluation may now only be implicit. Displays a confident range of knowledge and understanding, but with a few omissions at the lower end, e.g. some terminology missing or some pertinent relationships left unexplored. Synoptic elements should be a feature of the answer and seen to be meeting the question's requirements. Some possibly rather uncritical reference to theory; some reference to awareness of human perspectives and decisions taking on geographical issues and problems. Argues well, but organisation may be suspect in places. Support is invariably there, but may not always be detailed. A competent essay style. Effective communication skills with accurate spelling, punctuation and grammar.

14 – 20

A satisfactory answer ranging down to the mediocre, which always attempts, but not always succeeds to be relevant. Lacking in evaluation. Displays a reasonable grasp of knowledge, but understanding is suspect in places. Relevant theory and concepts might be mentioned but with basic uncritical application. The interconnections and relationships between different physical and/or human processes are briefly mentioned but understanding of their significance is limited. There is some synoptic content which is relevant to the question. Argument and analysis are partial and become less significant in relation to mere description. Increasingly unbalanced as an answer, and the logic and organisation are clearly deficient. Support is not detailed here, occasionally inaccurate and barely consistent. The bare bones of an essay format. Appropriate communication skills so that meaning is almost invariably clear with adequate language skills. Possibly some spelling/punctuation/grammar errors.

7 – 13

A very mediocre answer, which is only occasionally relevant to both the theme and the demands of the question. Decidedly deficient in knowledge and understanding with only simplistic notion of relevant theory and concepts. Little if any relevance to inter-relationships between physical and/or human processes and factors or subject matter from other elements in the specification. Increasing irrelevance in a predominantly descriptive context. Clearly lacks an ability to organise material and may drift into another answer. Support is scanty and usually suspect. A weak, barely perceptible, essay format. Basic communication skills – many spelling errors and/or oddities of grammar and punctuation.

1 – 6

A very weak answer, which shows little attempt to follow the theme and the demands of the question.

A very low level of knowledge and understanding, with even the simplest of concepts avoided. Very inaccurate and may completely miss the point. No idea of how to organise material with haphazard format, evidence of guesswork and little or no support. No attempt at an essay format. Little or no language and communication skills. Many errors in spelling, punctuation and grammar.

Question 4**To what extent are coastal protection schemes pointless?**

This question refers to the Coastal management section of the specification and allows a wide-ranging discussion of coastal protection schemes.

Synoptic elements may possibly come from MEDW/LEDW, tourism, economics and a broader world-view regarding pointlessness. See generic scheme for criteria bands – examiners are reminded that clear synoptic content is required for credit of 21 and over.

The question of pointlessness may be addressed in a variety of ways; from the relatively simplistic notion that the sea is too big and too relentless to be defied, through various forms of cost-benefit analysis, to wider ranging issues such as the possible impacts of global warming, including sea level rise and the likely increase in storm conditions.

Possible content:

- Hard and soft engineering schemes and their relative merits
- Various forms of coastal protections, dams, barriers, wall and dykes as well as sand dune replenishment etc.
- National scale projects, such as the Netherlands, compared to projects such as Bangladesh
- Smaller scale projects such as the Thames Barrier
- Cost benefit analysis of various schemes
- Reasons for such schemes, including commercial, environmental or tourists
- Recognition that some schemes have more than one purpose
- Examples of storm surges, 1953 North Sea Surge, cyclonic conditions linked to Himalayan snow melt in South East Asia and/or the New Orleans Hurricane floods of 2005
- Other reasons for coastal problems, including tsunamis
- Problems of specific places, such as Venice.

A descriptive case study or series of examples of coastal protection schemes (possibly management strategies) with no explicit relationship to the question but from which an answer may be inferred is unlikely to achieve more than 16 marks. Such a response with concluding comment which refers clearly and explicitly to the terms of the question and which offers some reason(s) as to why working with nature is (or is not) more appropriate can achieve up to 20 marks.

Discussion requires a debate to be held and a view should be stated. Any reasonable conclusion can be credited providing it is measured, realistic and related to essay content.

Total for this question: 30 marks

Question 5**Discuss the assertion that mass movement is the least important form of geomorphological hazard.**

The question is designed to open up the whole of the geomorphological section of the specification, not just mass movement. Although the assertion may seem self-evident, any view is valid providing it is supported and argued appropriately.

Synoptic elements can include geomorphological processes outside the specification, such as river floods, also LEDW/MEDW comparisons, historical and economic approaches as well as tourism. See generic scheme for criteria bands - examiners are reminded that clear synoptic content is required for credit of 21 and over.

A sound essay may well contain definitions of the three key elements; mass movement, geomorphological and hazards. An answer that does not do this at some stage, either explicitly or implicitly, is less likely to achieve high marks.

Although not explicitly stated, the likely impact of such hazards is very appropriate when considering their relative importance. This may be viewed on a human (in terms of deaths, secondary effects and emotional response), economic and/or environmental impacts.

Support in the form of exemplars/case studies is important in order to assess comparative impacts between mass movement and other hazards.

Possible content can include:

- Examples of mass movement including flows, slides and heaves
- Where mass movement is a hazard, such as landslides and mud flows or even composite forms
- Examples of other geomorphological hazards, including those which are tectonic in origin, as well as flooding, both fluvial and marine
- Case studies/exemplars of hazards and their impact where comparisons can be made between mass movement and other geomorphological hazards.

A descriptive case study or series of examples of mass movement and/or other geomorphological hazards with no explicit relationship to the question but from which an answer may be inferred is unlikely to achieve more than 16 marks. Such a response with concluding comment which refers clearly and explicitly to the terms of the question and which offers some reason(s) as to why mass movement is a relatively unimportant form of geomorphological hazard (or otherwise) may achieve 20 marks.

An answer that deals solely with mass movement is unlikely to achieve marks above the satisfactory band. Discussion requires a debate to be held and a view should be stated. Any reasonable conclusion can be credited providing it is measured, realistic and related to essay content.

Total for this question: 30 marks

Question 6

Discuss the statement that economic development inevitably has a negative impact on cold environments.

This essay is designed to allow candidates to engage not only with cold environments but also with human activity and problems. Cold environments are wide-ranging and some can cope with more damage than others. For instance, the extreme cold of the Polar Regions has a much slower recovery rate than mountain regions such as the Alps.

Synoptic elements can include broader environmental concerns, political and social issues and/or tourism. See generic scheme for criteria bands - examiners are reminded that clear synoptic content is required for credit of 21 and over.

Possible content:

- Reasons for the fragility of such an environment and why even minimal damage takes so long for the system to recover
- Permafrost and its associated problems
- The Trans Alaska pipeline
- Resource exploitation from early whaling, trapping, mining to recent HEP, drilling for oil, etc.
- Over-fishing in the Southern Ocean
- Tourism in many forms, including cruise ships to Antarctica, skiing in the Alps and/or walking/climbing in Lake District/Snowdonia
- Issues of conservation of wilderness areas
- Possible sustainability of economic development
- Since the question does not tie the 'economic development' directly to cold environments, answers which refer to global warming, rising sea levels, ozone depletion etc., are clearly relevant.

There are some examples where the negative impact on the environment has been minimised.

The use of thermal pads, stilts etc. in buildings.

The Trans Alaskan Pipeline with stilts to raise the pipeline above the permafrost and to allow migration of caribou, etc.

Attempts at greater sustainability, often relating to lifestyles of Inuit, etc.

It could be argued that impact on indigenous peoples might constitute a negative impact but, to carry any credit, this must be clearly linked to the environment.

A descriptive case study or series of examples of economic development in cold environments with no explicit relationship to the question but from which an answer may be inferred is unlikely to achieve more than 16 marks. Such a response with concluding comment which refers clearly and explicitly to the terms of the question and which offers some reason(s) as to why economic development inevitably has a negative impact on cold environments (or otherwise) may achieve 20 marks.

Any reasonable conclusion can be credited providing it is measured, realistic and related to essay content.

Total for this question: 30 marks