GCE A Level Examiners' Report

Subject: Geology

Level: A Level

Summer 2024

Introduction

Our Principal examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners and Principal Moderators after the completion of marking and moderation, and details how candidates have performed in each component.

This report opens with a summary of candidates' performance, including the assessment objectives/skills/topics/themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.[1]

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

Further support

Document	Description	Link
Professional Learning / CPD	Eduqas offers an extensive programme of online and face-to-face Professional Learning events. Access interactive feedback, review example candidate responses, gain practical ideas for the classroom and put questions to our dedicated team by registering for one of our events here.	https://www.eduqas.co.uk/home/professional-learning/
Past papers	Access the bank of past papers for this qualification, including the most recent assessments. Please note that we do not make past papers available on the public website until 12 months after the examination.	Portal by WJEC or on the Eduqas subject page
Grade boundary information	Grade boundaries are the minimum number of marks needed to achieve each grade. For linear specifications, a single grade is awarded for the subject, rather than for each component that contributes towards the overall grade. Grade boundaries are published on results day.	For unitised specifications click here: Results and Grade Boundaries and PRS (eduqas.co.uk)

[1] ***Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.***

Exam Results Analysis	Eduqas provides information to examination centres via the WJEC Portal. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.	Portal by WJEC
Classroom Resources	Access our extensive range of FREE classroom resources, including blended learning materials, exam walk-throughs and knowledge organisers to support teaching and learning.	https://resources.eduqas.co.uk/
Bank of Professional Learning materials	Access our bank of Professional Learning materials from previous events from our secure website and additional pre-recorded materials available in the public domain.	Portal by WJEC or on the Eduqas subject page.
Become an examiner with WJEC.	We are always looking to recruit new examiners or moderators. These opportunities can provide you with valuable insight into the assessment process, enhance your skill set, increase your understanding of your subject and inform your teaching.	Become an Examiner | Eduqas

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Executive Summary

Each of the three written-exam components had a similar structure to those seen in previous years. The performance of candidates on these was generally similar to that seen in 2023, with a slight increase in marks achieved in Component 3.

In Component 1, candidates generally showed good knowledge of the formation and identification of minerals, and the construction of the cross-section was undertaken well. The answers to the extended writing fieldwork design question were tackled better than in previous years, although there were still some very generic answers which scored low marks. Responses requiring knowledge of silicate structures and models of ocean-ridge formation were usually rather weak.

In Component 2, candidates generally performed well in answers related to processes of fossilisation, factors affecting climate change and the Wilson cycle. Candidates had more difficulty explaining evidence for derived fossils and recalling the differences between xenoliths and enclaves. In some questions it was clear that candidates had not considered the number of potential marks available for their answer when planning and writing their responses.

In Component 3 candidates displayed good knowledge of both seismic and mining hazards addressed in Section A, and generally tackled mathematical questions competently. Topics in which candidates did not perform particularly well included the identification of cleavage in a deformed sedimentary rock sequence, the identification of fault features from the BGS map, the causes and effects of Quaternary sea level changes, Mesozoic evidence for changing sea levels, and the effects of lithospheric loading. Candidates also found the more holistic BGS map related questions quite demanding.

It is important that candidates pay attention to answering the question fully, using all the key information given in the stem of the question.

In Component 4, the Practical Endorsement, all the centres observed this year showed a generally good understanding of the requirements of Practical Endorsement, and with advice from the visiting monitor all were able to meet the requirements of Practical Endorsement. Centres would do well to read and note the detailed advice set out in the Component 4 section of the Examiners Report.

Areas for improvement	Classroom resources	Brief description of resource
Planning fieldwork investigations	COMPONENT 1 EXAM WALK THROUGH	PowerPoint with audio commentary. Slides for Q5 exemplify how to tackle a fieldwork planning question
Writing answers that respond to all the key information given in the stem of the question. Writing answers that reflect the number of marks available	Online exam review	Annotated samples of candidate responses which can be used to show good practice.
Recall of more complex topic areas	KNOWLEDGE ORGANISERS	A collection of knowledge organisers to support the learning of AS and A level Geology.

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COMPONENT 1 – GEOLOGICAL INVESTIGATIONS

Overview of the Component

As in line with previous years, Section A had two stand-alone questions with Section B being an integrated geological practical paper that included a map, specimens and photographs.

The topics covered this year included: silicate structures and phase diagrams; alternative plate tectonic models; evaporites; igneous petrology; bivalve modes of life; coal; structural geology and dating techniques.

The following skills were assessed: mineral testing and identification; drawing fossils; interpreting phase diagrams; planning a field investigation; geological map interpretation and drawing a geological cross-section.

It was noted that a significant number of candidates used the additional page but did not indicate in the script that they had done so. It would aid the marking process considerably if centres could stress the importance of candidates indicating to examiners when their response goes onto an additional page.

Overall performance was similar to previous years.

Comments on individual questions/sections

Q.1 While the vast majority of candidates had little difficulty in identifying augite, a surprisingly high number of candidates were unable to identify the rock as gabbro with the most common mistake being to state 'peridotite'. Most candidates could not correctly identify the silicate structures.
The rest of the question proved to differentiate well between candidates.

Q.2 Most candidates had little difficulty in locating the Moho, identifying the type of faulting and explaining how magma is generated. It was pleasing to see most candidates scored highly when asked to compare and contrast the two models. The most common error in part (b) was to describe the structure of the asymmetric model as opposed to discussing the lithology of the rocks that outcrop on the sea floor.
In part (c) it was clear that the vast majority of candidates had a sound and secure knowledge and understanding of how magnetic reversals can be used as evidence for sea floor spreading. However very few candidates were able to relate drilling to either enable microfossils to be obtained which would enable dating to be done, or to investigate the structural differences between the two models.

Q.3 While most candidates gave a detailed description of how to test the hardness of a mineral, the most common error was to give a vague statement such as “hardness test”. Candidates that chose a non-diagnostic test such as “streak” were given credit for a correct result.

It was pleasing to see that the vast majority of candidates had little difficulty in describing the environmental and climatic conditions needed to form halite, with a number of candidates quoting specific environments such as a playa lake or a sabkha.

Q.4 It was disappointing to see a significant minority of candidates using sedimentary terms such as “poorly sorted” and “angular” when asked to describe the texture of an igneous rock.
Most candidates correctly identified the type of igneous body and backed this up with suitable evidence. Part (c) proved to differentiate well with some candidates giving economic arguments as well as describing how feldspar can chemically weather into kaolinite.

Q.5 The overall quality of the drawings by the candidates was good, with the majority of candidates scoring full marks on part (a). The most common error was to draw an external rather than an internal view. In such cases credit was given for the correct shape and scale. It was pleasing to see that most candidates had little difficulty identifying Specimen K as a bivalve and were able to give a suitable reason.
Part (c) provided a wide range of marks, with most candidates relating the pallial sinus in Specimen L to the fact that it was a burrower. The most common error was to suggest that Specimen K was a swimmer or attached to a rock.

Q.6 This question produced a wide range of marks. Those candidates that embraced the spirit of the question and planned an investigation scored highly. However, the most common responses could be put into two categories. Either a generic response was given, often with a very lengthy discussion about potential health and safety issues, followed by a list of possible observations but with no justification as to why these observations were being carried out. These answers were placed in the bottom band. Alternatively, an interpretation of the photographs was given, for which candidates were not awarded any credit.
The most common reason for candidates not being able to be placed in the top band was a lack of detail with regards to the observations being suggested. For example, suggesting that grainsize is something that could be observed to determine the energy levels, but no mention of how a hand lens and ruler, or grain size card, would be required in order to do this.

Q.7 While most candidates had little difficulty identifying the coal as anthracite very few candidates were able to give two reasons to confirm this. As some centres received samples that could have been classified as bituminous coal, full credit was also given for correct reasons in these cases.

Q.8 This proved to be one of the most accessible questions on the paper. For part (a), the most common error was to leave the map completely blank, suggesting that some candidates missed the question. The vast majority of candidates scored full marks when completing the table.

Q.9 Completing the geological cross-section continues to be a good discriminator which again produced a wide range of marks. Although a few candidates achieved full marks, the most common errors were not recognising that the B/D boundary would show an apparent dip on the cross-section, and not showing the cross-cutting relationship between the base of Rock Unit A and fault F1. It was pleasing to see that the high overall quality of cross-sections shown by last year's cohort has been maintained.

Q.10 The majority of candidates scored full marks on part (a). In part (b), while most candidates had no difficulty performing the required mathematical calculation, a significant number were unable to give their answer to the correct number of significant figures. Very few candidates were able to state two assumptions or limitations of using the Potassium/Argon method to date rocks.
Most candidates correctly identified Rock Unit A as being Cretaceous in age, and most were able to discuss the footprints in Figure 6b. However very few candidates recognised that the footprints were in Rock Unit D and therefore they also needed to consider the cross-cutting relationship between Rock Units A and D.

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COMPONENT 2 – GEOLOGICAL PRINCIPLES AND PROCESSES

Overview of the Component

As in previous years, the paper consisted of six questions which generally increased in difficulty. As usual, AO2 marks on this paper formed the largest focus. Topics covered this year, included: fossil preservation methods; magma generation at convergent plate boundaries; deformation of Carboniferous limestones; contributing factors to the development of the Antarctic ice sheet; sediment analysis; and forces responsible for tectonic plate movement. Overall performance was in line with previous years.

Comments on individual questions/sections

Q.1 In response to this question, the majority of candidates were able to identify fossils A and C, but a surprising number misidentified fossil B as a bivalve. Candidates showed a good understanding of the reasons for inaccuracy in the fossil record. Candidates who did not score highly on this question tended to expand on only one valid point, instead of recognising that this is a three-mark question requiring three valid points. Other candidates who did not score highly incorrectly assumed that the question required knowledge of the factors attributed to good zone fossils. Although candidates understood how derived fossils form, very few used the term ‘derived’ or indeed made any reference to an ‘unconformity’, both of which would have increased the number of marks awarded. Candidates responded very well to the QER six-mark question, generally scoring in the upper five-six marking band. Common misconceptions included references to the calcite shell ‘weathering away’ or references to ‘magma crystallising in the mould’.

Q.2 In question two candidates struggled to precisely draw a graph of ‘line V’. Most were able to construct the linear section of the graph with a line of best fit for two marks, but few recognised the decrease in temperature at depth for the third mark. Candidates should be encouraged to use a ruler to be as precise as possible when referencing graph values in their answers. Very few candidates seemed to know the difference between enclaves and xenoliths or how they form. Again, candidates on the whole demonstrated a good understanding of magmatic differentiation, but those that did not score highly tended to focus on one factor in particular often repeating themselves, rather than determining that this is a four-mark question requiring four valid points, or at the very least two well developed points.

Q.3 In question three candidates coped very well with the ‘stereonet’ and demonstrated a good understanding of deformation using key terms appropriately. The best candidates were able to interpret the clusters of data in Figure 3b as an indication that the fold is plunging. Most candidates also interpreted the map data in Figure 3c well.

Q.4 In response to question four, candidates generally scored highly in part (a) and part (c) of this question but struggled more so with part (b). Many misinterpreted the graph data in Figure 4b, instead commenting on whether the temperature (^{o}C) data and atmospheric (CO_2) data exhibited any positive or negative correlation, rather than focussing on the arrows at 45.5Ma and 34Ma, relating the data back to the onset and acceleration of ice sheet growth.

Q.5 Overall, candidates seemed able to interpret Figure 5a and calculate the coefficient of sorting using the given formula. However, many were unable to use '$2^{-\varphi}$' to convert the median grain size to 'mm'. A significant number of candidates were unable to provide the correct environment of deposition for orthoquartzite or provide any correct textural analysis of the sediment. Candidates are advised to carefully read all information available before attempting to construct graphs – a high number of candidates missed (or at least initially missed, hence the crossing out) that the curve represents *cumulative* frequency. Candidates are also reminded to draw lightly in pencil first and then check their response.

Q.6 In response to question six, candidates exhibited a good understanding of convection currents, slab pull, and ridge push. Some candidates struggled to apply their trigonometry skills to part (c)(ii), but many others were confident in showing their working and sensibly rounding their answer. A very small minority of candidates were able to apply their GCSE science knowledge to successfully explain the forces involved. Overall, candidates demonstrated a good understanding of how palaeomagnetic data is recorded. However, many missed that the question referred specifically to continental plates, and others simply wrote much more than required for a two-mark question suggesting candidates should use mark schemes to better understand the level of requirement for two, three, and four-mark questions.

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COMPONENT 3 – GEOLOGICAL APPLICATIONS

Overview of the Component

As in previous years, the paper consisted of two Geohazards questions, a series of questions related to a Geological Survey map, and three questions assessing each of the three options. Topics covered this year included: seismic hazards; hazards related to the extraction of raw materials; geological map interpretation; field sketching and fold and fault characteristics.

The Component 3 paper produced a wide range of marks with candidates able to access all parts of the paper. Candidates who used the data in the figures, and read the questions carefully were able to achieve good marks across all sections of the paper. Overall performance was slightly better than that in 2023.

Comments on individual questions/sections

Section A

Q.1 Candidates found this question accessible with virtually all able to relate earthquakes in Haiti to the plate boundary, though a minority of candidates focussed on the convergent margins despite their distance from Haiti. The reasons for the destruction as a result of an earthquake such as this were relatively well understood, although some candidates discussed small differences in population of the settlements rather than why a differing percentage of buildings were destroyed. Stronger answers explained the role seismic-gap theory played in preparedness for earthquake events.

Q.2 In question 2 the candidates who were able to achieve the highest marks in the last part of the question were those who were able to apply the data and answers they had worked on earlier in the question. The calculations discriminated well; most candidates were able to calculate the area of the site, with the stronger answers converting this into a volume, taking account of the remaining rock in the mine. Most recognised the nature of the geohazard at this location, with the majority able to explain why the risks would increase over time, with many good answers combining their understanding of the geology with human activity in this location. A broad range of approaches to answering the last part of the question were credited.

Section B

Q.3 This question was designed to highlight some key features regarding the structural geology of the map area. Candidates performed well on parts (a) and b(i), especially those who noted a trend/orientation requires a bi-directional description. Parts b(ii) and b(iii) assessed understanding of the relationship between dip angle, outcrop thickness and true thickness. Candidates who scored the best noted that outcrop width should increase with decreasing dip and therefore were able to give thorough answers to b(iii).

Q.4 Question 4 focused on the cleavage found within the rock units on the map. 4(a)(i) required the drawing of a field sketch, which most candidates accessed well. Candidates who achieved the highest marks recognised features such as bedding, cleavage and graded bedding, and clearly labelled these on the diagram. Candidates should be reminded to put quantitative data onto field sketches, as few made notes of dip angles. Question 4(a)(ii) was not accessed by many candidates as they misidentified the features in Figure 4a. Candidates who scored well noted the varying behaviour of different lithologies when exposed to stress. Candidates were able to tally, and plot rose diagrams well. Question 4(b)(iii) was answered best by those who noted the perpendicular relationship between dip angle and strike and could therefore link the cleavage planes to the axial planar traces of the folds.

Q.5 This question focussed on the faulting present in the map area. Candidates who scored highest used the map key to their advantage when describing evidence for fault type and relative movement. As well as this they were able to explain, not simply state, the evidence they would look for in the field to confirm fault displacement. For part (c), analysis of the cross-section was key. Those who scored well were able to identify the fault blocks and their relative movement and link them to the map and stress directions.

Q.6 Part (a) was accessed well by most candidates who were used to describing features on a map. Part (b) proved more challenging. Whilst most were able to note that the intrusion was younger than the surrounding beds due to its discordance, or the information from the geological column, few noted the subtleties of the relationship between the fault and the intrusion. Those who scored well, noted that the fault does not conclusively cross-cut the intrusion due to the discontinuous nature of F^g, and therefore a clear relative age cannot be obtained from the map alone.

Q.7 Question 7 was centred around sedimentary depositional environments. Most candidates were able to recognise the features in Figure 7 as flute casts and provide a description of them. Candidates should be reminded to use scales carefully as many over exaggerated the size of the flutes. Successful candidates described the evidence flute casts provide for ascertaining palaeocurrent current direction, and were able to link all aspects of the paper together, recalling that beds had been overturned. In the final part of question 7, successful candidates assessed all the evidence, synoptically pulling information from throughout Section B and the resource sheet, to confirm the statement provided.

Section C

Option 1 – Quaternary Geology

Q.8 Many candidates limited the marks they could achieve by failing to read the rubric of question 8 carefully enough to ensure their answers were about the correct deposit in the sequence shown. The calculation of age saw some common repeated mistakes with confusion between daughter and parent isotopes, workings missing key parts of the equation given and failing to realise that the answer from the calculation is in years not millions of years. Candidates should be encouraged to check that their answers fall within an expected time range, such as within the Quaternary period. Many candidates were able to recognise the limitation of dating with ^{14}C.

The last part of the question proved to be challenging with a minority of answers correctly identifying the landform as a drowned valley and only a few of the strongest candidates being able to explain why this coastline could have evidence of different sea levels, with many answers merely repeating the evidence from earlier parts of the question.

Q.9 Many good answers were seen for this question with most candidates able to describe changes in brain size and climates. A good range of answers were seen for suggestions for the increase in brain size. The best responses to the last part of this question were the ones that considered the data carefully to compare the frequency and trends shown by the graphs.

Q.10 A full range of answers was seen with the best responses dealing with the three types of fossils and how the application of uniformitarianism to their geographical distribution and adaptations can be used to reconstruct climates. Many answers included relevant examples of these fossils and the climatic information that they can yield.

Option 2 – Geological Evolution of Britain

Q.11 Most candidates were able to describe the textural features of the sediment shown, but only a few could then relate these to dropstones during a Snowball Earth event. A majority of candidates made the link between carbonate sediments and the climatic change at the end of glaciation with many then able to interpret the graphic log. The calculation of age saw some common repeated mistakes with confusion between daughter and parent isotopes, workings missing key parts of the equation given and failing to realise that the answer from the calculation is in years not millions of years. Candidates should be encouraged to check that their answers fall within an expected time range, such as within the Palaeogene period.

Q.12 A minority of candidates demonstrated a sound understanding of the Caledonian Orogeny, with knowledge of the plate tectonic history of the orogeny being demonstrated by only a few in the strongest answers. It was clear that geophysical techniques were generally understood well, however only those techniques that would have effectively mapped the granites were credited.

Q.13 A full range of answers was seen. The best responses dealt with different sea levels during different geological periods and provided a clear link between the fossils and sedimentary rocks, with an overview of how sea levels changed. Only a few of the strongest answers illustrated their responses with relevant examples from the British geological record.

Option 3 – Geology of the Lithosphere

Q.14 This question focussed on mantle plumes. Candidates were able to access the graphical and mathematical aspects of the question well and had a clear understanding of how to tackle these areas of the question. The most successful candidates were able to evaluate the map evidence well, linking the flood basalt event to the head of a plume and the island chain to a plume tail. Candidates should be reminded that evaluating evidence requires more than simple statements or observations. For the final part of the question, successful candidates not only noted that a mantle plume wouldn't ordinarily produce two compositions of magma, but also noted the difference in ages and distance from the ocean ridge of composition B.

Q.15 With a focus on seismology, this question produced a wide range of marks. Successful candidates were those who were able to make use of key terms, correctly relating seismic velocity changes to changes in rigidity and incompressibility, as well as noting that increased density causes a reduction in seismic velocity. These candidates were able to realise that although P3 travelled a longer distance, it was able to reach the seismograph first due to being able to travel at higher speeds. Successful candidates also noted that P1 and P2 were constantly travelling in the same material – the crust.

Q.16 Question 16 focussed on the formation and subsequent deformation of foreland basins. Candidates who scored highest noted that foreland basins form in compressional collision zones due orogenesis adding load to the lithosphere causing an isostatic adjustment. In order to access the upper band, candidates needed to note that basins are not just formed by a depression in the lithosphere, but also an upward bulge which forms the boundaries of the basin. Successful candidates then went on to make detailed descriptions of the deformation which would occur in these basins, accurately describing nappes and thrust belts. Candidates should ensure the question is read carefully and they should respond to the question asked. Candidates who struggled avoided the lithospheric loading aspect of this question and explored sedimentary basins more generally, often discussing extensional settings.

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PRACTICAL ENDORSEMENT

General Comments

A number of centres were observed, all of which demonstrated a good understanding of the requirements of Practical Endorsement. A couple of centres experienced some difficulties due to a changeover in staffing but with advice from the visiting monitor were able to meet the requirements of Practical Endorsement.

Aspects of good practice seen during the visits include:

- A suitable plan of practical work. The plan was incorporated into a Scheme of Work and was often also kept as a separate document, available to all members of teaching staff. A suitable plan showed the specified practical, the CPAC to be assessed in the practical, and the proposed time in the teaching year where it would be carried out. Please note this plan, with these details, must be available to the monitor if you are visited.
  The plan should also allow for the development of skills within Practical Endorsement and should cover all elements of each CPAC over the two years of teaching. It is not necessary to assess CPAC on every practical performed.
- The maintenance of accurate and up-to-date Teacher and Candidate Records.
  This is vital. Most centres now record their outcomes in an Excel Spreadsheet, often showing the CPAC element. However, if teacher records do not show this level of detail (i.e. the element assessed) then teachers should annotate the candidate work showing the element achieved (e.g. *CPAC 3(a)*✓ or CPAC 3(a&b)✓*).*
  Monitors will always check to ensure all elements of each CPAC are covered and will ask teachers how they ensure all aspects of the skills are achieved by each candidate.
- Candidates are aware which CPAC are assessed in a particular practical and understand what they need to do in order to succeed.
- Practical books are used in 'real time' at the bench by candidates when collecting experimental data.
  We do not expect to see practical books which are in immaculate condition! Candidates should **not** write on scraps of paper and later copy the work up neatly into practical books.
- There is simple annotation of the candidate work shows where the candidate achieves or fails to achieve a CPAC, (e.g. with *CPAC 3(a)*✓ or *CPAC5(b)*✗*).* It is good practice to give feedback to candidates in order that they can improve on their skills in future. Feedback on how to improve may be given verbally or in writing.
  Important note: Many centres now record the CPAC element assessed in a practical which helps ensure all aspects of CPAC are covered.

- Records of candidate performance show a progression in candidate attainment. It is not necessary for a candidate to succeed and obtain a CPAC every time. Early in the course there will be occasions where a candidate may struggle to achieve a skill. This should be reflected in the teacher records of candidate performance. We do **not** expect to see every candidate getting every criterion each time they are assessed. Indeed, when this happens there will be legitimate concerns about whether the work has been appropriately assessed. We expect to see that there are places where candidate work is marked 'not achieved'. The key question is, 'Is the candidate competent at the end of the course and **not**, is the candidate competent all the way through the course.'
- Although A level Geology is generally delivered by one teacher, where more than one teacher is involved, there must be evidence of standardisation across all teachers delivering the specification.
  Important note. It is a requirement of Practical Endorsement and is recorded in the monitor's report of the centre. Standardisation must be implemented for a centre to pass the monitoring visit. Where standardisation is necessary it may be carried out by cross-marking of candidate work or by meetings in which some candidate work is discussed. Please expect questions on how you do this if visited by a monitor.

Assessment of Practical Endorsement

Centres are reminded that in order to award a pass for Practical Endorsement, a candidate needs to 'consistently and routinely meet the criteria'. Although this does **not** mean a candidate gets a CPAC every time it is assessed, it does means that a candidate develops these skills as the course progresses. In other words, there should be evidence that the candidate gains a pass for each CPAC statement on a number of occasions particularly towards the end of the teaching programme. It is important that suitable opportunities have been built into the assessment plan which allow candidates to generate this evidence.

It is understood that some practical work will need to be carried out in small groups. If these practicals are used to assess candidates, each candidate must generate suitable evidence that he or she **independently** meets the criteria. Centres must give careful consideration to how group work is conducted so that individual candidates can be assessed on their own performance.

Notes on assessment of CPAC

The Monitor finds it difficult to expand on comments from previous years. It is important that centres read through these comments carefully to ensure they are compliant with our expectations.

As a general rule, set high standards for the achievement of CPAC skills early in the course. Be clear on what you expect from candidates and ensure they understand why they have failed to meet the standard (if they fail) and they understand what to do to achieve it next time.

CPAC 1

The assessment of this CPAC requires the candidate to correctly follow written instructions to carry out an experimental technique or procedure.

In the vast majority of cases, the monitor accepted the teacher's judgement unless there was strong evidence to suggest the CPAC was incorrectly awarded.

Please note, where a teacher feels it is necessary to intervene and correct a candidate's technique, explain the intent of an instruction etc. then the candidate should not be awarded the CPAC.

CPAC 2

This is the most difficult CPAC for candidates to evidence since it involves higher level skills. Your plan should show you know where and when you are going to assess **each element** of this CPAC. It is also important that sufficient time is given to candidates to develop the necessary skills before assessment occurs**. Generally, we do not expect to see this CPAC assessed in the first two terms of an A level course.** However, we do expect to see evidence of some assessment of this criterion by the end of the first year of the A level course. This skill may be evidenced by a candidate planning to carry out a procedure and then adapting their approach, as necessary.

It is **not** necessary to assess every element of CPAC2 each time this CPAC is assessed. However, it is a requirement that each element of CPAC2 is met during the course. If you are monitored, the monitor will look at the coverage of each element.

This CPAC may be evidenced as a candidate plans to carry out a procedure and then adapting their approach as necessary. Field work presents centres with excellent opportunities to assess this skill; these opportunities should be taken. Obviously, candidates must first have the opportunity to develop the skills before they can be expected to carry them out independently. The 'Lab based fieldwork exercise' lays out an approach which allows candidates to generate suitable evidence towards most aspects of this CPAC. Centres are strongly encouraged to use this as a training exercise before doing field work. Centres can also use this as a model to assess fieldwork.

The monitoring team have also seen candidates asked to complete extension activities to practical work (e.g. to **SP20** – candidates plan how to investigate how heat flow depends upon grain size). Incidentally this is a good activity to evidence **2c** which can be difficult to do in geology. On another occasion, candidates were given a tray of equipment and asked to use the most appropriate equipment to measure the density of different minerals. Candidates were asked to justify the equipment they used.

CPAC 3

Please select practicals where there are some significant safety issues (e.g. where an acid is used, where candidates need to heat etc) for candidates to comment upon when assessing this CPAC. Do **not** use practical work to assess this where hazards are minimal. It is not

necessary to assess this skill every time a practical is completed. Field work is also an ideal place to assess both aspects of this skill.

CPAC 3(a) requires candidates to identify hazards and assess the risks associated with the hazards. A simple written risk assessment is the easiest and most effective way of evidencing this aspect of the skill.

CPAC3(b) should be assessed by observation of candidates conduct during a practical session / field work.

CPAC 4

This CPAC deals with both qualitative and quantitative data. There are multiple opportunities in geology to both develop and assess this skill.

There is a tendency for centres to be too lenient when assessing this skill. Ensure that you demand high standards from early in the course for this skill and take time to ensure candidates understand what is required from them.

CPAC4(a) making accurate observations.

Ensure that the following points are borne in mind when assessing this CPAC:

- Observations should be made directly into candidate practical books / spreadsheet. Do not award this CPAC if the candidate writes results on to scraps of paper to copy up later.
- Do **not** award this CPAC if you provide a template table to the candidates for recording results.
  Templates may be useful to teach candidates a good approach to recording data early in the course but when it comes to assessment candidates **must** devise their own tables. Where necessary, remove table templates from the documentation you provide to candidates and allow candidates to construct their own tables.
- The tables which candidates construct **must** have appropriate headings and units, where relevant. Please maintain hight standards here. It is perfectly possible for all candidates to achieve this.
- The units must be written in the table column head and not in the body of the table. If units are missing, do **not** award criteria.

When the candidate draws a diagram, please ensure good practice is followed before awarding the criterion. For example, where relevant:

- The diagram is reasonably accurate
- A sharp pencil used
- There is a title
- Continuous clear lines are used
- Key structures are labelled
- Scale bar present
- Annotation lines are straight, and annotations written horizontally

- Shading not used
- Field sketches should have compass directions on each side of the sketch

CPAC4(b) obtaining accurate, precise and sufficient data .....

Please carefully check candidates' data.

- Is it recorded to appropriate precision? Occasionally some centres are too lenient on this. If data readings are not consistently recorded by a candidate, then do **not** award the criteria. Make sure that recordings are to the correct number of decimal places. Be particularly careful to check that candidates are recording readings from an instrument correctly. You should be walking around the classroom checking on candidates as they record some of their values.
- Is there sufficient data? Is the data what you expect? Please set suitable standards at the beginning of the course. It does not matter if a candidate did not always achieve the criterion.

CPAC 5

This important higher-level skill should be assessed from early in the course. There is no shortage of suitable assessment opportunities. CPAC 5 has two elements:

(a) Uses appropriate software and/or tools to process data, carry out research and report findings.
(b) Sources of information are cited demonstrating that research has taken place, supporting planning and conclusions.

CPAC5(a)

There should be evidence of candidates processing data using graphs and calculations. Centres should require candidates to use software (e.g. Excel) to draw graphs on a number of occasions. **SP19** and **SP20** are good places to use Excel to generate graphs.

- Make sure graphs are constructed correctly, i.e. there is a title, each axis is correctly labelled, points plotted correctly, an appropriate scale used, etc. Candidates will need to be shown how to use Excel to correctly title graphs etc. It is evident that candidates do not always know how to use Excel appropriately. Excel graphs can be disappointing and show the candidate does not know how to use this powerful tool. Please ensure candidates are taught how to use Excel first.
- Processing data also involves carrying out calculations. This may involve transformation of data using mathematical equations, statistical analysis etc.

CPAC5(a) also includes 'carry out research and report findings'. The report does not need to be long; it may simply the conclusion they draw from their data. However, neither is it is not appropriate to award this CPAC for a one-word answer. A conclusion requires a reasoned response to the data observed. The research maybe internet or book based.

CPAC5(b)

This is not a difficult CPAC to evidence, but it is still not getting enough attention from many centres and as a result is often poorly evidenced in candidate work. Just a few centres are to be commended for having candidates demonstrating referencing on multiple occasions; a few of these even using the Harvard System (which exceeds our requirements for this CPAC).

Please try to get candidates in the habit of evidencing this every time they source data (e.g. a density value) or indeed any information, they must learn to reference their quote. This should happen from **early** in the course and you want it to become second nature to candidates. The information may come from a textbook, journal, website, EDUQAS data sheet.

Summary

- Successful delivery of Practical Endorsement needs careful thought and planning. Make sure that there are ample opportunities for candidates to evidence all elements of each CPAC statement over the two years of the course. We do **not** expect candidates to achieve each CPAC every time practical work is assessed. Where CPAC is met every time by all candidates then that is an indicator that a centre may not be appropriately assessing.
- Field trips are an ideal place to assess CPAC once candidates have some experience, but this does require some thought beforehand. Which CPAC statements can be assessed? Where is the evidence going to be generated? The field notebook is an obvious place e.g. for CPAC 3(a), 4 and, when assessed, CPAC 2. If it is evidence from observation (e.g. CPAC 1 or 3(b)) how are you going to record this? Will a checklist help? Don't be over ambitious but don't lose the opportunity.
- Ensure that candidates are clearly informed which CPAC is assessed in a particular practical session.
- Make Practical Endorsement a servant of the subject. Use Practical Endorsement to make better geologists. Do not let it become an end in itself.
- Make sure that candidates are informed whether they have achieved Practical Endorsement before the final outcomes are submitted to Eduqas in accordance with JCQ requirements.

Supporting you

Useful contacts and links

Our friendly subject team is on hand to support you between 8.30am and 5.00pm, Monday to Friday.

Tel: 029 2240 4253

Email: geology@eduqas.co.uk

Qualification webpage: Eduqas AS/A level Geology

See other useful contacts here: Useful Contacts | Eduqas

CPD Training / Professional Learning

Access our popular, free online CPD/PL courses to receive exam feedback and put questions to our subject team, and attend one of our face-to-face events, focused on enhancing teaching and learning, providing practical classroom ideas and developing understanding of marking and assessment.

Please find details for all our courses here: https://www.eduqas.co.uk/home/professional-learning/

Regional Rep Team

Our regional team covers all areas of England and can provide face-to-face and online advice at a time which is convenient to you.

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