

Moderators' report

INCLUDED ON THE
KS4 PERFORMANCE TABLES

OCR Level 1/Level 2

Cambridge National in
Engineering Design

J822

For first teaching in 2022 | Version 1

R039-R040 Summer 2023 series

ocr.org.uk/cambridgenationals

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Introduction

Our Lead Moderators' reports are produced to offer constructive feedback on centres' assessment of moderated work, based on what has been observed by the moderation team. These reports include a general commentary of accuracy of internal assessment judgements; identify good practice in relation to evidence collation and presentation and comments on the quality of centre assessment decisions against individual Learning Objectives. This report also highlights areas where requirements have been misinterpreted and provides guidance to centre assessors on requirements for accessing higher mark bands. Where appropriate, the report will also signpost to other sources of information that centre assessors will find helpful.

OCR completes moderation of centre-assessed work in order to quality assure the internal assessment judgements made by assessors within a centre. Where OCR cannot confirm the centre's marks, we may adjust them in order to align them to the national standard. Any adjustments to centre marks are detailed on the Moderation Adjustments report, which can be downloaded from Interchange when results are issued. Centres should also refer to their individual centre report provided after moderation has been completed. In combination, these centre-specific documents and this overall report should help to support centres' internal assessment and moderation practice for future series.

Online courses

We have created online courses to build your confidence in delivering, marking and administering internal assessment for our qualifications. Courses are available for Cambridge Nationals, GCSE, A Level and Cambridge Technicals (2016).

Cambridge Nationals

All teachers delivering our redeveloped Cambridge Nationals suite from September 2022 are asked to complete the Essentials for the NEA course, which describes how to guide and support your students. You'll receive a certificate which you should retain.

Following this you can also complete a subject-specific Focus on Internal Assessment course for your individual Cambridge Nationals qualification, covering marking and delivery.

Please note, the content for this report is based on candidate work submitted in the June 2023 series and does not include work from the extraordinary autumn submission opportunity. It is possible that not all units are covered within the report, however candidate style work is available for all internally-assessed units on Teach Cambridge and candidate exemplars from the 2023 series will be available from the autumn.

GCSE, A Level and Cambridge Technicals (2016)

We recommend all teachers complete the introductory module Building your Confidence in Internal Assessment, which covers key internal assessment and standardisation principles.

Following this you will find a subject-specific course for your individual qualification, covering marking criteria with examples and commentary, along with interactive marking practice.

Accessing our online courses

You can access all our online courses from our teacher support website [Teach Cambridge](#).

You will find links relevant to your subject under Assessment, NEA/Coursework and then Online Courses from the left hand menu on your Subject page.

If you have any queries, please contact our Customer Support Centre on 01223 553998 or email support@ocr.org.uk.

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If you do not have access to Acrobat Professional there are a number of **free** applications available that will also convert PDF to Word (search for PDF to Word converter).

General overview

It is important for moderators to receive candidate work from centres by the deadline date. Delayed submission of samples slows down the moderation process, and the resolution of issues should they arise during moderation.

Centres should check carefully what sample work is being requested for moderation and make sure that the correct sample of candidates is sent to the moderator.

A completed Unit Recording Sheet (URS) is required for each candidate in the requested sample. Without a correctly completed URS for each candidate moderation cannot take place and will be delayed.

Please make sure that all candidates are correctly identified on their paperwork with the correct candidate number. This includes in the naming of electronic files.

Clerical errors

Please carefully check the addition of marks on the URS and their transcription to Interchange. If they are incorrectly totalled or transcribed, we will need to reconfirm them with centres at moderation. This introduces delay to the moderation process.

A copy of the IMS1 mark sheet generated by Interchange is no longer required to be sent to your moderator and can be retained in centre.

Marker comments on the URS

Marker commentary on the URS, along with clear indication of how the mark given is derived, helps greatly with the moderation process. Page numbers of where evidence can be found in the candidate evidence is also extremely useful. Candidate work can also be directly annotated showing where each Topic Area and mark band is being addressed.

Centres are reminded that work cannot be double counted, and if used as evidence for one Topic Area should not be used for others. This is also the case for work that overlaps more than one Topic Area or Unit within the qualification. Work that is double counted might be discounted if found during moderation, thereby disadvantaging the candidate.

Internal standardisation

If more than one marker is marking a cohort of work, it is crucial to standardise marking across markers. Internal standardisation makes sure that the marks presented are accurate and consistent, and that the rank order of marks is maintained. Rank order errors are referred back to the centre by the moderator and often require the centre to remark work, thereby delaying the moderation process.

Photographic evidence should be annotated by the candidate to explain what is being presented. It should also clearly identify the candidate using their candidate number.

Authentication

It is essential that candidate work is authentic. This means that it is individual, and that sources of information are referenced. This is not only good practice but avoids the risk of penalties being applied. Moderators check for authenticity during moderation, referring any suspected cases to OCR for further investigation. This will delay moderation and may have serious consequences for the centre and candidate. Copies of Candidate and Unit authentication statements are required to be completed and should be kept in centre in case they are requested. They do not need to be sent to the moderator.

Centres must use the Teacher Observation Records (TORs) included with the Set Assessments to support and corroborate candidate-generated evidence where independence is part of the marking criteria. Where a TOR is not included, and the Topic Area requires the corroboration of independence then this should be noted on the URS.

Teacher Observation Records (TORs)

TORs are used to support and corroborate evidence produced by candidates and are useful where this evidence is difficult to show directly. Examples include working independently, working safely, and producing high quality finished items. They cannot be used as a direct source of evidence when the candidate is able to produce evidence themselves. Moderation will impose penalties where a TOR is used incorrectly. TORs should be individualised for each candidate, and not all be identical.

Full guidance on how to use the TOR correctly can be found alongside the supplied TOR with each Set Assessment brief, with further guidance on the OCR website.

Unit R039 General overview

Candidates demonstrated some excellent sketching and drawing skills in this unit and were clearly able to use Computer Aided Design (CAD) software effectively and competently.

Comments by Topic Area

Topic Area 1: Manual production of freehand sketches

Most candidates demonstrated very good sketching skills and were able to produce several initial design ideas. Rendering often included shade, tone, and texture. Labels and annotations were often used effectively to explain the key features and to link the design back to the requirements of the design specification, as is required. From the marking criteria it should be noted that both 2D and 3D sketches are required – in some cases just 3D sketches were produced. Candidates should be encouraged to produce a range of different design ideas using sketches from which they select a single design to develop in Tasks 2, 3 and 4.

Assessment for learning



2D and 3D sketches:

Refer to the marking criteria for this Topic Area, Task 1 and Task 2. Both 2D and 3D sketches are required to satisfy this fully.

Topic Area 2: Manual production of engineering drawings

There was clear evidence of a range of different 2D and 3D formal drawing techniques being used. While there was evidence of candidates producing drawings by hand, the use of CAD produced formal drawings is acceptable for this Topic Area. Please remember that a 3rd Angle Orthographic drawing (2D) and Assembly Drawing (3D) is required for this Topic Area. Please refer to the Unit Specification for a range of suitable formal engineering drawing techniques. More successful candidates were able to fully dimension and annotate their drawings.

This Topic Area (Task 3) requires the use of a TOR to support independent working (which is supplied with the Set Assignment brief).

Assessment for learning



2D and 3D formal drawings:

Refer to the marking criteria and Assessment Guidance for this task published in the [Specification](#) Handbook.

To fully satisfy this task, candidates are required to produce 2D and 3D formal engineering drawings, which should include things like dimensions, etc.

OCR support



Teacher Observation Records (TORs):

A blank TOR template along with full guidance on its use for Task 3 can be found in the Set Assessment brief.

It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.

Topic Area 3: Use of Computer Aided Design (CAD)

While well attempted, it was not always obvious to see the final design that candidates were proposing. Candidates, however, often demonstrated excellent skills and ability in using CAD software. Please remember that the CAD design should be suitably rendered and include dimensions and assembly views. The marking criteria for this Topic Area (Task 4) also requires corroboration of level of independence with which candidates work in producing their 3D virtual models. While no TOR is currently supplied with the Set Assignment brief for this, a statement by the teacher in the comments section of the Unit Recording Sheet will suffice.

Assessment for learning



Use of evidence:

Where there is overlap of content, it is essential that evidence used to satisfy one task is not credited twice (i.e. double counted).

In this unit, CAD drawings produced for Task 3 and Task 4 should be clearly separate for each Task so that they are marked just once.

Unit R040 General overview

While generally most candidates made a very good attempt at this unit, others did not fully address all the requirements of each task as set out in the marking criteria. As this unit requires candidates to undertake a practical activity in Topic Area 1, Task 2, direct evidence of this activity being performed is essential.

It was evident in this unit that most candidates were clearly capable of planning for and making a prototype. Final evaluation of the prototype against the design specification also requires some attention in Task 6.

Comments by Topic Area

Topic Area 1: Product evaluation

Task 1 was generally well attempted with most candidates being able to analyse a range of different clocks using the ACCESS FM approach. They were also able to identify the relative strengths and weaknesses of existing products, and present evidence using an appropriate engineering matrix. This was often a tabulated approach with clocks being relatively ranked and compared against each other using the ACCESS FM criteria. Some candidates also presented their data using graphs (e.g. bar charts). More ambitious candidates/centres attempted to use the QFD matrix with some good success. It should be remembered that candidates should demonstrate both the use of primary and secondary research techniques.

Task 2 was often well attempted by candidates who were able to safely disassemble and analyse a clock provided to them by the centre. This Task relies both on direct evidence from the candidate, and additional supporting evidence of independent working using a TOR. Direct evidence can be provided by the candidate using a simple risk assessment along with step by step annotated photographs. Evidence of independent working can be corroborated using the TOR supplied with the Set Assignment brief. The analysis of the dismantled clock needs to consider function of components, materials, production methods, assembly methods and manufacturing methods. Often not all these points were sufficiently covered, or some were omitted altogether.

Assessment for learning



Referencing:

This task provides excellent opportunity for candidates to reference the information they have found while researching, e.g. from the Internet.

Referencing is important to avoid potential plagiarism, and further guidance on referencing is available in the Specification Handbook and on the OCR website.

OCR support



Teacher Observation Records (TORs):

A blank TOR template along with full guidance on its use can be found for Task 2 in the Set Assessment brief.

It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.

Topic Area 2: Modelling design ideas

For Task 3 candidates generally demonstrated good use of CAD software to replicate the drawing of the clock supplied, and to model this using individual mated components. While the task asks for the operation of the clock to be simulated, a wide range of examples of this were taken as acceptable including (but not limited to): videos of the clock rendered image being rotated, the hands being moved, the clock being shown in exploded view, etc. More complex simulations, such as those showing stress and strain in components, etc., were also accepted. This task is also marked on the basis with which candidates worked independently to produce their CAD model. While no TOR is currently supplied with the Set Assignment brief for this, a statement by the teacher in the comments section of the Unit Recording Sheet will suffice.

In Task 4 candidates made a good attempt at planning to produce the prototype clock. There was evidence of different styles of planning, including the use of a table with suitable headings, and also flow charts. While most plans were quite detailed, some would benefit from the inclusion of more stages of the manufacturing process. Please also remember that it is a requirement of this task to demonstrate an understanding of safety considerations. This task is also marked on the basis with which candidates worked independently to produce their production plan. Again, while no TOR is currently supplied with the Set Assignment brief for this, a statement by the teacher in the comments section of the Unit Recording Sheet will suffice.

For Task 5 there was often good evidence of prototype making in action. Please encourage candidates to provide detailed step by step annotated photographs of this activity taking place, recording all key stages of the making process. This task relies both on direct evidence from the candidate, and additional supporting evidence of independent working using a TOR. Evidence of independent working can be corroborated using the TOR supplied with the Set Assignment brief.

For the final task, Task 6, while many candidates were able to provide a comprehensive evaluation of their prototype against each of the aspects of the product specification and make suggestions for potential improvements, some of these evaluations were lacking in depth and detail.

Assessment for learning



Planning:

Candidates could be provided with a blank planning template or table with appropriate headings for them to complete.

OCR support



Teacher Observation Records (TORs):

A blank TOR template along with full guidance on its use can be found for Task 5 in the Set Assessment brief.

It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.

Assessment for learning



Review:

Task 6 provides an excellent opportunity to develop skills at the process of review by reviewing a prototype against a product specification and making suggestions for improvements.

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Reviews of marking

If any of your students' results are not as expected, you may wish to consider one of our post-results services. For full information about the options available visit the [OCR website](#).

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For the June 2023 series, Exams Officers will be able to download copies of your candidates' completed papers or 'scripts' for all of our General Qualifications including Entry Level, GCSE and AS/A Level. Your centre can use these scripts to decide whether to request a review of marking and to support teaching and learning.

Our free, on-demand service, Access to Scripts is available via our single sign-on service, My Cambridge. Step-by-step instructions are on our [website](#).

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