ENGINEERING MANUFACTURE

Moderators' report

OCR Level 1/Level 2

Cambridge National in
Engineering Manufacture

J823
For first teaching in 2022 | Version 1

R015-R016 Summer 2024 series

ocr.org.uk/cambridgenationals

Cambridge Nationals

OCR
Oxford Cambridge and RSA

Contents

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Introduction

Our 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 comment on the quality of centre assessment decisions against individual Learning Objectives. The 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 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 2024 series. It is possible that not all units are covered within the report, however candidate style work and candidate exemplars from the 2023 series are available for all internally-assessed units on Teach Cambridge .

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.

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 awarded is derived, helps greatly with the moderation process. Page numbers of where evidence can be found in the candidate work 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 task should not be used for others. This is also the case for work that overlaps more than one task 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 ensures 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, for example, 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 Assignments to support and corroborate candidate-generated evidence where independence is part of the marking criteria. Where a TOR is not included, and the task 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 Assignment brief, with further guidance on the OCR website.

Unit R015 General overview

In this unit it was evident that candidates were able to plan for manufacturing of a one-off product using hand and manual machining processes. Their evidence was sometimes let down by lack of step-by-step evidence of each stage of the marking out and manufacturing processes.

Comments by task

Task 1 – Planning the manufacture

Task 1 requires candidates to produce a production plan. Various styles of plan were presented including tables and flow charts. The more successful plans tended to be those that were tabulated, and which included: sequence number, description of operation, tools and materials required, health and safety considerations, timings, and QC checks. Plans need to include sufficient step-by-step detail to manufacture and assemble the product (i.e. the door hanger).

There was sometimes evidence of candidates interpreting the features on the supplied drawing using suitable annotations to begin with – and although this is a sound approach to starting this task in preparation for planning it is not strictly required.

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

Task 2 – Risk assessment

For Task 2 candidates need to undertake a Risk assessment to identify any potential hazards and their associated risk, identifying suitable control measures. This was generally well attempted. Centres can use the Risk assessment template provided with the Set Assignment brief or use their own if desired. It is also sound to provide some estimate of the level of risk involved with hazards, and how this is reduced with the use of suitable control measures and the use of personal protective equipment (PPE).

Assessment for learning: Risk assessments
Candidates can use the supplied Risk assessment template with the Set Assignment, or an alternative could be supplied by the centre for them to use.

Task 3 – Measuring and marking out

Task 3 was generally well attempted with candidates being able to demonstrate the safe use of equipment to undertake marking out. Please encourage candidates to provide detailed step-by-step annotated photographs of this activity taking place, recording all key stages of the marking out process. This can be done using a series of annotated photos. This task is also marked on the basis with which candidates worked independently to perform marking out. While no Teacher Observation Record (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.

It is recognised that marking out (Task 3), manual machining (Task 4) and use of tools/equipment (Task 5) might be attempted as a series of interleaved activities and recorded as a single photo diary which is acceptable. If this is the case, then it is useful to identify which task is being addressed in their annotations.

Task 4 – Machining

Task 5 – Use tools and equipment

Task 4 and Task 5 require candidates to use manual machining processes and hand tools to produce a one-off product. Again, these tasks were generally well attempted, although sometimes let down by lack of step-by-step evidence.

Please make sure that candidates produce sufficient step-by-step annotated photographic evidence showing all key stages of manufacturing relevant to both Task 4 and Task 5. A photograph of the completed, assembled product (i.e. the door hook) should also be included.

Also please try and avoid the overuse of stock photos that do not show the candidate undertaking the manufacturing activities. Where it is not acceptable to show the candidate's face in the images, a card with the candidate number in the image will suffice.

The overuse of text in the annotations is also not required; the annotations should explain briefly the activity being demonstrated and do not need to analyse this.

These tasks rely 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.

OCR support: Teacher Observation Records (TORs)

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A blank TOR template along with full guidance on its use can be found for Task 4 and Task 5 in the Set Assignment 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.

Unit R016 General overview

There was often sound evidence presented in this unit of candidates being able to plan for and perform activities related to scale manufacture using CNC machines. There was also evidence of undertaking quality control, although this was often the weakest part of the assignment evidence presented.

Comments by task

Task 1 – Manufacture templates

In this task there was clear candidate evidence, in the form of annotated photos, of a suitable template being produced using card/paper. This method of producing a template is perfectly acceptable (as per the assessment guidance in the specification handbook), which also notes that it can also be done using CAD/CAM (e.g. laser cutting) if desired. Please note that the intention of this task is to produce a template to be used later in the quality control activity in Task 5 to check the quality of the finished components.

There was some evidence of candidates using a disproportion amount of time for this activity in detriment to activities in the later tasks.

Task 2 – Produce a standard operating procedure

Most candidates were clearly able to produce a standard operating procedure (SOP) for this task which included sequence of operation, CNC operating parameters and health and safety considerations. Some centres seemed a little unsure of what an SOP should contain and could refer online for examples.

Alternatively, the SOP could be presented in tabulated form, considering stage number, task, method, quality control, safety measures and timing. The SOPs were often logical and very well detailed and included setup parameters for the CNC equipment. Risk assessments could additionally be produced using the template supplied with the Set Assignment brief. It is also sound to provide some estimate of the level of risk involved with hazards, and how this is reduced with the use of suitable control measures and the use of personal protective equipment (PPE).

> **Assessment for learning: Standard operating procedure (SOP)**
>
> Candidates could be provided with a blank SOP template or table with appropriate headings for them to complete.

Task 3 – Use CAD software

Candidates often demonstrated well the use of CAD software to set up the program for the CNC machine using a series of annotated screen shots. Level of independence with which this was done was, in most cases, supported with a statement on the URS. Perhaps the screen shots (or another alternative such as a short, embedded video) could show more clearly the on-screen simulation being performed (e.g. a tool path simulation). This was sometimes a little difficult to follow in some of the evidence presented.

Task 4 – Set up and operate CNC equipment

For this task there could perhaps be better evidence of the safe setup and operation of the CNC machine using annotated photos. This was not always presented by candidates. Photos of the finished product components and assembly were, however, evident in most cases. The task was often correctly supported by the TOR. Please remember that the TOR can only be used to support and corroborate candidate evidence, which for this task could be in the format of annotated photos. It was also good to see a photo, in most cases, of the final, assembled, product (i.e. the sunglasses holder).

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 Assignment 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.

Task 5 – Quality control

It was evident that most candidates were able to undertake QC checks using their template(s) in most cases on the completed CNC-manufactured component parts. They had often used the card template to check their components parts. In some cases, they also appear to have matched them up to a scaled drawing which is not required. It is also a requirement for this task, however, for candidates to take measurements using suitable measuring equipment. Measurements should then be recorded and compared to those expected on the drawing. A tabulated approach to presenting and comparing measured and actual readings often works well. Annotated photos should also be used to show QC checks being performed.

Assessment for learning: Quality control

Candidates could be supplied with a quality control template to use where they record expected and actual measurement values and indicate if these are acceptable or not.

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Make sure you visit our secure website **Teach Cambridge** to find the full range of resources and support for the subjects you teach. This includes secure materials such as set assignments and exemplars, online and on-demand training.

Don't have access? If your school or college teaches any OCR qualifications, please contact your exams officer. You can forward them this link to help get you started.

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.

Access to Scripts

We've made it easier for Exams Officers to download copies of your candidates' completed papers or 'scripts'. 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.

Keep up-to-date

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Online courses

Enhance your skills and confidence in internal assessment

What are our online courses?

Our online courses are self-paced eLearning courses designed to help you deliver, mark and administer internal assessment for our qualifications. They are suitable for both new and experienced teachers who want to refresh their knowledge and practice.

Why should you use our online courses?

With these online courses you will:

- learn about the key principles and processes of internal assessment and standardisation

- gain a deeper understanding of the marking criteria and how to apply them consistently and accurately

- see examples of student work with commentary and feedback from OCR moderators

- have the opportunity to practise marking and compare your judgements with those of OCR moderators

- receive instant feedback and guidance on your marking and standardisation skills

- be able to track your progress and achievements through the courses.

How can you access our online courses?

Access courses from Teach Cambridge. Teach Cambridge is our secure teacher website, where you'll find all teacher support for your subject.

If you already have a Teach Cambridge account, you'll find available courses for your subject under Assessment - NEA/Coursework - Online courses. Click on the blue arrow to start the course.

If you don't have a Teach Cambridge account yet, ask your exams officer to set you up – just send them this link and ask them to add you as a Teacher.

Access the courses **anytime, anywhere and at your own pace**. You can also revisit the courses as many times as you need.

Which courses are available?

There are **three types** of online course for Cambridge Nationals.

All teachers delivering our redeveloped Cambridge Nationals suite from September 2022 are asked to complete the course **Essentials for the NEA**, 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 of the NEA units.

We have also created subject-specific **Understanding the examined unit** courses that provide a wealth of information to support you with the delivery, assessment, and administration of the examined unit. The courses outline the assessment structure, including details on synoptic assessment, performance objectives and command words for your Cambridge Nationals qualification. Working through the course, you have an opportunity to interact with resources developed to support the exam, in particular candidate exemplars and mark scheme guidance. The final section covers details on administrative requirements, including assessment opportunities, entry rules and resits.

How can you get support and feedback?

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

We welcome your feedback and suggestions on how to improve the online courses and make them more useful and relevant for you. You can share your views by completing the evaluation form at the end of each course.

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

Call us on
01223 553998

Alternatively, you can email us on
support@ocr.org.uk

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