

Moderators' report

A LEVEL

COMPUTER SCIENCE

**OCR Level 3 Advanced GCE in
Computer Science**

H446

For first teaching in 2015

H446/03/04 Summer 2025 series

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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 Cambridge Nationals suite 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.

GCSE, A Level and Cambridge Technicals (2016)

We recommend all teachers complete the module on Online courses – NEA for their subject. These courses provide subject-specific information about course content; how to prepare for planning, marking and submitting; and support with understanding the marking criteria.

Accessing our online courses

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

These free online courses currently cover the end-to-end NEA process for teachers. You'll find the link to the **Online courses** under the **Assessment** or **Training** tab – hover over **Assessment** or **Training** on the horizontal menu and select **Online courses** from the dropdown.

These self-paced online courses are intended for any teachers. During the course, you will engage with interactive content on subjects such as guidance on unit content, structure and administrative processes.

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

General overview

The Component 3 project continues to be the stepping stone for students into the world of software development and, for most, is the first chance to have experience of producing a significant software solution.

As always, we see the endless pride and dedication that candidates place on their work through their detailed documentation, and the learning that is shown through each development story is a pleasure to witness.

This series has seen countless examples of innovative games produced with the most popular languages remaining as C# (Unity and Godot), Python (PyGame) and JavaScript. In addition, we also see many web solutions with students choosing to take on board modern development frameworks, mobile apps, and apps designed for Windows desktop.

More unique projects have included coding slicing software for 3D printers, using a physical robot to solve maze problems, and even a soothing fish art simulator. It is no surprise that year on year we are seeing an increase in artificial intelligence solutions with notable attempts to use machine learning to identify handwriting to ease teacher marking, AI vision to identify household waste for recycling and some success at using neural networks to understand the housing market.

Most centres show a good understanding of the marking criteria and candidates choose projects that are fit for study at this level.

Candidates who did well generally:	Candidates who did less well generally:
- analysed the problem in depth, producing detailed explanation and justification of features, hardware/software requirements and success criteria - designed detailed algorithms using either flowcharts or language-independent pseudocode, fully explaining how they form a complete solution to the problem - produced detailed development journals that showcased every stage of development, along with the thought processes and decisions that were made - made testing during development an intrinsic part of the development journey with many examples of failed tests and the necessary remedial action making up the beginning of the next iteration of development - produced evidence of distinct and different final testing, including detailed examples of robustness testing and usability testing - used evidence from the testing to evaluate success criteria - fully evaluated usability features and discussed limitations and ongoing maintenance, considering the number of marks available for the section.	- missed the marking point for explaining and justifying feature lists, hardware/software requirements and success criteria, producing short statements only - designed algorithms that were high level overviews only or submitted algorithms that were clearly reverse engineered from written code - wrote code for the solution first then tried to retroactively write the development story, often missing or not remembering many of the details and decisions that were undertaken - added testing during development as a section at the end of development, attempting to produce evidence from code that had already been completed - attempted to use the same evidence for evaluation testing as testing during development or produced too few tests to realistically showcase robustness testing - evaluated success criteria without linking it to evidence from testing - produced rushed evaluations lacking in detail, possibly due to spending too long developing the solution.

Most common causes of centres not passing

Analysis

As a general rule, the analysis section is the part of the project that is best understood by both candidates and markers, and we generally see almost all candidates produce detailed attempts.

The most common marking errors with analysis are:

- submitting high marks when candidates have fully omitted one of the marking criteria (e.g. hardware/software requirements). In such instances, a 'best-fit' approach should be taken with the marking scaled back to a lower mark band
- misunderstanding that features, hardware/software requirements and success criteria need to be explained and justified in depth to achieve the top mark band
- submitting high marks when candidates have not researched the problem in depth. This involves looking at existing systems and should be a range of systems
- submitting low marks for candidates who have not included an interview with stakeholders. Such interviews/questionnaires are not a requirement of this project.

Design

The spirit of this section is that the design should happen before code is written. This can be either in one large section before any code is written at all or broken down into smaller sections of design at the beginning of an iterative cycle.

Common marking errors are:

- submitting high marks when algorithms are too high level to form a complete solution, algorithms are clearly reverse engineered, or algorithms are not explained and justified
- submitting high marks when evidence is missing for a marking criterion (see comment above about 'best-fit' marking).

Development and testing during development

This section is best evidenced as an ongoing development journal with screenshots of code and the solution being developed over time.

Common marking errors are:

- misinterpretation of the statement 'code should be annotated to aid future maintenance'. This means that comments should be included in the code itself and not just in the accompanying documentation
- submitting high marks when candidates did not produce development journals that describe the full process of development, possibly due to candidates attempting to write these at the end of the project rather than in an ongoing nature
- submitting high marks for testing during development when candidates have not produced extensive evidence of failed tests and remedial action taken
- submitting marks when the only evidence of testing is a test table. It is necessary to back up testing tables with either screenshots or video evidence.

Misconception



Students completing the Component 3 project are expected to write code using a high level language that a professional might use. Beginner environments (e.g. Greenfoot or GameMaker) or block coding environments (e.g. Scratch or Blockly) are not acceptable.

Also, markup code such as HTML/CSS or XAML are not worthy of credit on their own and should be accompanied by suitable code written in a high level language such as JavaScript, Java or Kotlin.

Testing to inform evaluation

Common misconceptions are:

- to achieve the marks for robustness testing, candidates are expected to test their solution 'to destruction'. This should feature a high number of tests, including a wide range of test data (e.g. normal, boundary, invalid) and may include performance tests, cross-browser or cross-device testing depending on the solution
- the most common evidence towards usability testing is a review from stakeholders or other end user group. Where this is missing, a mark in the middle or lower mark bands is most appropriate.

Evaluation

This is the section that sees the most marking errors. It is common for candidates to rush through the section, and this can be seen in the quality of work. Common issues are:

- to score highly, candidates should use the evidence from their testing to review success criteria. In cases where candidates fail to use testing evidence, the first marking criterion has not been met, and marks should reflect this
- candidates should thoroughly evaluate usability features and comment on partially successful features and how they could be improved. Should this section be omitted, then the 'best-fit' approach can be taken
- centres often submit high marks when only a limited effort has been made to discuss limitations and ongoing maintenance concerns. It is advised to look at the number of marks available for the section to gauge the level of detail needed in the response to score in the highest mark bands.

Common misconceptions

There is no need for candidates to have real end users for the project. Identifying a particular group of potential stakeholders (or a target audience) is sufficient. Following from this, candidates do not need to get a 'sign off' from end users during any stage of the project.

Game engines (e.g. Unity, Unreal) are a popular choice for young developers and can often yield spectacular results. However, it should be noted that candidates only receive marks for the code that they write and any discussion of using the features of the engine is not worth any credit on its own.

Candidates should aim to choose projects that have sufficient scope for this level of study. A guide might be to include at least some of the programming features that only appear at A Level, e.g. complex data structures, object-oriented techniques or client/server interactions. Candidate should be steered away from ideas that may frequently appear in GCSE classrooms such as simple quiz systems.

Avoiding potential malpractice

The use of tutorials remains a concern. It is important that centres maintain a vigilance surrounding this and understand that candidates can only be credited for the work that they produce themselves.

A candidate may follow a tutorial as a starting point for a section of development. This is a normal and natural process towards getting started in an unfamiliar domain. However, this tutorial must be referenced or this constitutes candidate malpractice. A centre should not give credit to code that has been developed from a tutorial. In order to score, a candidate should take the learning from the tutorial and take the development into a significant new and original scope proving they have undertaken their own development.

Similar practice should be observed when dealing with artificial intelligence tools. See the guidance note below.

Understanding artificial intelligence issues

Candidates may wish to submit projects that include their own attempts at creating machine learning models. This is acceptable. However, centres should consider the aims and spirit of the project: the skills being assessed are those of a software developer and not those of a data scientist. Machine learning projects should be encased in a general-purpose software solution with an appropriate graphical user interface, inputs and outputs. Writing individual lines of code to train and test a model is not sufficient scope alone to formulate a significant software solution.

Candidates may wish to write software solutions that make requests to existing models such as the popular range of large language models commercially available. This is also acceptable and is increasingly becoming common practice for software developers in industry. This should, of course, form part of a larger software solution and candidates should be reminded to fully document their processes and include relevant and robust testing.

A candidate may wish to use an artificial intelligence tool to write some code or to debug some code. This can be acceptable as a last resort, providing the use of AI is referenced and the candidate makes no attempt to pass off the work as their own. The centre should provide no credit for work produced by AI and make sure credit is only given to work that a candidate produces themselves.

Should a candidate submit work that has been produced by AI without reference (either code or any part of the documentation), then this is malpractice.

Helpful resources

OCR offer a free project checking service which will provide feedback on any project idea before candidates begin. Ideas can be submitted to ComputerScience@ocr.org.uk.

Exemplar projects can be found on the OCR website.

Additional comments

The best centres offer students free rein in project choice, development environment and language. This tends to yield increased candidate engagement, more detailed development and report writing plus allows the chance for true innovation to happen.

Candidates generally prefer to work at the cutting edge of technology, and many are eager to embrace the latest frameworks and development trends. This shines through in the enthusiasm of the documentation. Centres that enforce the use of legacy technologies tend to be less successful.

Supporting you

Teach Cambridge

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](#).

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Please find details for all our courses for your subject on **Teach Cambridge**. You'll also find links to our online courses on NEA marking and support.

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If you do not have an Interchange account, please contact your centre administrator (usually the Exams Officer) to request a username.

Once you have an Interchange username, use the form on [this page](#) to sign up for ExamBuilder, or ask an existing user at your centre to create an ExamBuilder account for you.

Active Results

Review students' exam performance with our free online results analysis tool. It is available for all GCSEs, AS and A Levels and Cambridge Nationals (examined units only).

[Find out more](#).

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 the link to the **Online courses** under the **Assessment** or **Training** tab – hover over **Assessment** or **Training** on the horizontal menu and select **Online courses** from the dropdown.

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?

We recommend all teachers complete the module on Online courses – NEA for their subject. These courses provide subject-specific information about course content; how to prepare for planning, marking and submitting; and support with understanding the marking criteria.

The subject-specific courses are tailored for each qualification that has non-exam assessment (NEA) units, except for AS Level and Entry Level. They cover the following topics:

- the structure and content of the NEA units
- the assessment objectives and marking criteria for the NEA units
- examples of student work with commentary and feedback for the NEA units
- interactive marking practice and feedback for the NEA units.

We are also developing courses for some of the examined units, which will be available soon.

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.

Tell us what you think

Your feedback plays an important role in how we develop, market, support and resource qualifications now and into the future. We want you and your students to enjoy and get the best out of our qualifications and resources, but to do that we need your honest opinions to tell us whether we're on the right track or not.

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