

GCSE (9–1)

# COMPUTER SCIENCE

J276  
For first assessment in 2018

Version 3: Valid for 2020 and 2021 examination series

## Programming Project Guidance



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Our documents are updated over time. Whilst every effort is made to check all documents, there may be contradictions between published support and the specification, therefore please use the information on the latest specification at all times. Where changes are made to specifications these will be indicated within the document, there will be a new version number indicated, and a summary of the changes. If you do notice a discrepancy between the specification and a resource please contact us at: [resources.feedback@ocr.org.uk](mailto:resources.feedback@ocr.org.uk).

We will inform centres about changes to specifications. We will also publish changes on our website. The latest version of our specifications will always be those on our website ([ocr.org.uk](http://ocr.org.uk)) and these may differ from printed versions.

# 1. Introduction

## 1.1. What is the Programming Project?

The Programming Project is an opportunity for candidates to engage in an authentic programming experience as part of the GCSE (9–1) Computer Science course.

The Programming Project does not count towards the final grade, but does consolidate the learning across the specification through practical activity. The Programming Project also helps to build core programming skills which will benefit the candidate in further study or employment.

Centres must:

- Provide learners with the opportunity to undertake the Programming Project during 20 timetabled hours. Record when the 20 hours take place.
- Ensure the work created is authentic and individual to that learner.
- Ensure that learners appropriately reference any material used from a source.
- Ensure that learners cover each part of the project: Analysis, Design, Development, Testing, Evaluation.

## 1.2. What is the purpose of this document?

This document should be read in conjunction with the GCSE (9–1) Computer Science specification (<http://www.ocr.org.uk/Images/225975-specification-accredited-gcse-computer-science-j276.pdf>) and provides further guidance on how the Programming Project is to be administered within your centre.

Teachers must ensure that they are familiar with all Programming Project requirements, as a failure to meet the requirements will be regarded as malpractice/maladministration.

## 1.3 How do I find out more information?

Please contact our Computer Science Subject Advisors for advice and support.

**01223 553998**

[ComputerScience@ocr.org.uk](mailto:ComputerScience@ocr.org.uk)

[@ocr\\_ict](#)

## 2. Tasks

### 2.1 Choosing a task

OCR provides three Programming Project tasks each year from which a candidate must complete **one**. This allows centres to either:

- a) Choose one task for their entire cohort
- b) Choose a separate task for each class group/set
- c) Allow candidates to pick the task they prefer

Programming Project tasks are released by OCR on 1 September. Centres must use the correct tasks for submission.

### 2.2 Where to find the tasks

These will be made available on the OCR Computer Science subject webpage <http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/>

## 3. Preparing candidates

### 3.1 Skills required

Candidates should have been taught all of the programming techniques listed within the specification for the Programming Project. Please see Section 2d and 2e of the specification for further details.

The programming techniques for the Programming Project are a subset of those required for the Component 02 written examination.

It is important for candidates to understand *why* and *where* programming techniques may be used. This should support them to be confident in 'thinking outside the box' when solving problems. This aids candidates in generating individual solutions.

### 3.2 Solutions

Candidates must work individually to produce a solution. Group work is **not** permitted.

Programming Project tasks allow a wide range of solutions and pathways to a solution, there is no single 'perfect solution'.

## 4. Resources and support

### 4.1 Use of resources

Candidates have unlimited access to resources and the internet during completion of the Programming Project.

We would recommend that candidates are given advice on where best to seek support as this will help candidates locate sources of support quickly and effectively. Teachers have a responsibility to ensure that any teacher-provided materials do not mimic the Programming Project task.

Candidates must be made aware that their work should be authentic, and all resources used are appropriately referenced.

Submission of plagiarised work may result in a malpractice investigation.

### 4.2 OCR resources

OCR resources that can support the Programming Project may be downloaded from our Computer Science subject webpage <https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/>.

### 4.3 Support

Teachers may assist and give feedback to candidates during the Programming Project, but candidates must be the driving force behind their solution. Teachers must not restrict candidates to specific solutions or provide entire solutions.

Where a teacher gives support to a candidate, it must be clear through the use of referencing where that support starts/ends, and where individual candidate work commences.

### 4.4 Writing frames, worked solutions and templates

OCR has produced a Programming Project Report template which candidates can use to guide them through their write up, providing a structure to ensure that they cover all sections of the Programming Project. This can be found on our website at: <https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/assessment/>

Teachers may customise or create their own document as long as it does not go beyond the OCR provided template in terms of support and structure.

The use of writing frames, third party worked solutions and 'similar but different' solutions are not permitted during completion of the Programming Project.

### 4.5 Referencing

Candidates must reference all resources and support used during the Programming Project task appropriately. We would encourage candidates to reference at point of use within their Programming Project report, rather than at the end.

Not referencing resources or support may be investigated as malpractice and/or maladministration.

# 5. Writing the Programming Project report

## 5.1 The Programming Project report

The report candidates write should document their work on the Programming Project task from start to finish. For any code/solution they develop, they are expected to produce evidence to show that they have completed the following:

- Analysis
- Design
- Development
- Testing
- Evaluation

For an authentic experience, candidates must engage with all areas of the Programming Project. There must be clear evidence that each section listed above has been attempted. Any refinements candidates make as they progress through the Programming Project should be captured within their report.

If any of the sections listed above have not been included or given only token consideration, it may result in a malpractice/maladministration investigation.

## 5.2 How to present the Programming Project report

Candidates should be encouraged to submit a single narrative for the Programming Project report. To help ensure that the report is clearly laid out, candidates should:

- Use page numbering
- Use headers/footers (Centre Number, Candidate Number, Candidate Name, Title of work)
- Use appropriate headings and subheadings
- Include screen shots with word wrapped text/annotation (this will help identify key steps candidates have taken)
- Complete a spelling and grammar check

OCR has produced a Programming Project Report template which candidates may find helpful to use. This can be found on our website at: <https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/assessment/>.

## 5.3 School accounts

You may use normal school accounts to complete the Programming Project. As a centre you have an obligation to ensure that your candidates' work is authentic. Some teachers may feel more comfortable in creating separate secured accounts.

## 5.4 Completion date

The Programming Project must be completed by 15 May for the year of entry.

Centres may complete the Programming Project in either year of the GCSE programme of study.

For centres undertaking a 3 year programme of study, it must be done in the second or third year of study (i.e. Year 10 or Year 11).

## 5.5 Feedback to candidates

There is no requirement to mark the Programming Project as it does not count towards a candidate's final grade.

We have provided a progress tracker should a centre wish to provide formative feedback to their candidates during the completion of the Programming Project (please see appendix 1).

To support teaching and learning, teachers may provide feedback which enables candidates to make progress through the Programming Project. This feedback should be referenced appropriately. The program and the report must still be candidate driven.

# 6. Monitoring of the Programming Project

## 6.1 Monitoring of work by OCR

OCR will contact all centres to request a sample of work for each examination series in which entries are made. OCR will be checking that the following Programming Project requirements have been met. Centres **must** have:

- Provided learners with the opportunity to undertake the Programming Project during 20 timetabled hours. Recorded when the 20 hours take place.
- Ensured the work created is authentic and individual to that learner.
- Ensured that learners appropriately reference any material used from a source.
- Ensured that learners cover each part of the project: Analysis, Design, Development, Testing, Evaluation.

## 6.2 Submitting your sample of work to OCR for monitoring

All candidate reports being sampled must be submitted electronically via post on CD/DVD/USB-drive. The sample must be posted to the address provided.

Candidates should create a single report file. The following file naming convention must be used:

**CentreNumber\_CandidateNumber\_Surname\_Forename\_Filename**

e.g. 99999\_2505\_Hopper\_Grace\_ProgrammingProject.pdf

We advise centres to keep a backup of all candidate work. Please note, work will not be returned to your centre after the monitoring has been completed.

We recommend you send unencrypted data wherever possible. If you have no other option than to use encrypted data, you can use the password provided within the sample request sent by OCR to secure the USB, CD or DVD. Alternatively, you can create your own password and email the password to [J276SampleRequest@ocr.org.uk](mailto:J276SampleRequest@ocr.org.uk).

Failure to submit the requested sample will be investigated as maladministration.

## 6.3 Additional documents

Candidates should include evidence of annotated code within the Development section(s) of their report. There is no requirement to submit raw code files, or compiled code. Where suitable, the raw code may be copied and pasted into the report for reference. Raw code and executable files will not be opened for security reasons and therefore cannot be relied upon as evidence.

Where use of multiple files is unavoidable (e.g. a word document with video evidence for some testing), each file must be suitably named to aid identification of its contents.

e.g. 99999\_2505\_Hopper\_Grace\_Videotesting.wmv

## 6.4 Candidate Authentication Statement

Each candidate must complete a Candidate Authentication statement which confirms the work they have produced is their own. A statement for you to use is located on the OCR webpage <http://www.ocr.org.uk/administration/stage-3-assessment/general-qualifications/internal-assessment/>.

Completed statements are held within your centre and are not required for submission with the sample.

## 6.5 Programming Project Authentication Form (CCS161)

There is a Programming Project Authentication Form (CCS161) for J276 (9–1) Computer Science. This must be completed and signed by all teachers who have been involved in delivering the Programming Project task. A senior member of staff will also be required to sign the form to confirm that all Programming Project requirements have been adhered to.

The form can be downloaded from the OCR webpage at <http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/>.

Once completed the form must be submitted electronically to OCR on the CD/DVD/ USB-drive which contains your centre's sample of work. Failure to submit the signed form will be investigated as maladministration.

## 6.6 Evidence of 20 timetabled hours

The Programming Project is to be completed within the classroom and evidence of delivery of 20 timetabled hours must be submitted with your signed CCS161 form and sample of work.

OCR provides a tracking spreadsheet that you may wish to use to record this time. This can be downloaded on our website at <https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/assessment/>.

## 6.7 Checklist: Sample submission to OCR

I have:

- all Candidate Authentication statements signed and stored in the centre
- a CD/DVD/USB-drive with a folder for each candidate whose work has been requested for sample monitoring
- within each candidate folder, a single Programming Project report file (ideally PDF format)
- used the correct naming convention for the Programming Project report file
- suitably labelled any supporting evidence within the correct candidate folder
- a completed tracking spreadsheet/time log evidence of delivery of 20 timetabled hours included with the sample on the CD/DVD/USB-drive
- checked all documents open correctly with no shortcuts copied in error
- the correct address for posting that was sent to the Exams Officer
- a backup copy of candidates work kept within the centre.



# Appendix 1: The Programming Project progress tracker

See Section 5.5

## Programming Techniques

<input type="checkbox"/> Few techniques are used	<input type="checkbox"/> Several techniques are used	<input type="checkbox"/> Most techniques are used
<input type="checkbox"/> There is no/limited attempt for all parts of the task	<input type="checkbox"/> There is a reasonable attempt for all parts of the task	<input type="checkbox"/> There is a complete attempt for all parts of the task
<input type="checkbox"/> Code is disorganised and lacks commenting	<input type="checkbox"/> Code is generally well structured and commented	<input type="checkbox"/> Code is consistently well structured and well commented
<input type="checkbox"/> The task is approached in a linear fashion	<input type="checkbox"/> The task has been broken down into component parts, but not always effectively	<input type="checkbox"/> The task has been broken down into component parts effectively and efficiently
<input type="checkbox"/> Designs do not reflect the code produced	<input type="checkbox"/> Designs are comparable to the code produced	<input type="checkbox"/> Designs accurately reflect the code produced
<input type="checkbox"/> There is no real efficiency built into the code	<input type="checkbox"/> There is some efficiency within the code	<input type="checkbox"/> The code is fully efficient

## Analysis

<input type="checkbox"/> There is little analysis for each part of the task	<input type="checkbox"/> There is some analysis for each part of the task	<input type="checkbox"/> There is full analysis for each part of the task
<input type="checkbox"/> There is a limited attempt to decompose the task	<input type="checkbox"/> There is some attempt to decompose the task	<input type="checkbox"/> There is a full attempt to decompose the task
<input type="checkbox"/> Decomposition is not effective	<input type="checkbox"/> Decomposition is generally effective	<input type="checkbox"/> Decomposition is fully effective
<input type="checkbox"/> Success Criteria identified are generic and lack detail	<input type="checkbox"/> Success Criteria are defined and generally detailed	<input type="checkbox"/> Success Criteria are clearly defined and detailed
<input type="checkbox"/> Success Criteria do not cover task functionality	<input type="checkbox"/> Success Criteria cover some task functionality	<input type="checkbox"/> Success Criteria cover all task functionality
<input type="checkbox"/> Discussion of approaches is limited	<input type="checkbox"/> Discussion of approaches is present but not justified	<input type="checkbox"/> Discussion of approaches is present and justified
<input type="checkbox"/> Testing plans are limited, or are present but have no explanation	<input type="checkbox"/> Testing plans present and discussed. Some are linked to the requirements.	<input type="checkbox"/> Testing plans are present and justified in relation to the requirements
<input type="checkbox"/> Validation for robustness is not discussed or limited	<input type="checkbox"/> Validation for robustness is discussed but not justified	<input type="checkbox"/> Validation for robustness is justified against the requirements
<input type="checkbox"/> There is no, or limited mention of real-world utility	<input type="checkbox"/> There is some discussion of real-world utility	<input type="checkbox"/> There is full discussion of real-world utility

## Design

<input type="checkbox"/> The algorithms are either incomplete or missing	<input type="checkbox"/> The algorithms are complete, but not fully functional	<input type="checkbox"/> The algorithms are fully complete and clearly functional
<input type="checkbox"/> The intended approach is not discussed or justified	<input type="checkbox"/> The intended approach is discussed but not justified	<input type="checkbox"/> The intended approach is both discussed and fully justified
<input type="checkbox"/> The user interface is not planned, or planned but not functional	<input type="checkbox"/> The user interface is planned but may not be fully functional	<input type="checkbox"/> The user interface is fully planned and functional
<input type="checkbox"/> The design could not be used to construct the intended solution	<input type="checkbox"/> The design could be used to construct the intended solution with some guidance	<input type="checkbox"/> The design could be used to construct the intended solution without guidance
<input type="checkbox"/> The test plan covers some basic functionality but is limited	<input type="checkbox"/> The test plan covers most functionality with some robustness testing	<input type="checkbox"/> The test plan covers full functionality and covers robustness testing
<input type="checkbox"/> There is limited discussion of variables and data structures	<input type="checkbox"/> There is discussion of most variables and data structures	<input type="checkbox"/> There is justification of all data structures and variables
<input type="checkbox"/> There is little evidence of modular designs	<input type="checkbox"/> Most of the program is designed in a modular way – but not effectively	<input type="checkbox"/> An effective modular design is produced

## Development

<input type="checkbox"/> There is little or no evidence of how the solution was built	<input type="checkbox"/> There is some evidence of key development points as the solution was built	<input type="checkbox"/> There is comprehensive evidence of the solution as it was built
<input type="checkbox"/> There is little or no evidence of systematic testing during development	<input type="checkbox"/> There is some evidence of systematic testing during development	<input type="checkbox"/> There is full evidence of systematic testing during development
<input type="checkbox"/> There is little or no evidence that systematic testing is used to refine the solution	<input type="checkbox"/> There is some evidence that systematic testing is used to refine the solution	<input type="checkbox"/> There is significant evidence that systematic testing is used to refine the solution

## Testing

<input type="checkbox"/> The test plan has been partially completed, missing key requirements testing	<input type="checkbox"/> The test plan has been mostly completed, with key requirements tested	<input type="checkbox"/> The test plan has been fully completed, with all requirements tested
<input type="checkbox"/> The solution meets a few of the success criteria	<input type="checkbox"/> The solution meets most of the success criteria	<input type="checkbox"/> The solution meets all of the success criteria
<input type="checkbox"/> Testing for robustness has not been completed	<input type="checkbox"/> Some testing for robustness is evidenced	<input type="checkbox"/> Testing for robustness is fully evidenced

## Evaluation and Conclusions

<input type="checkbox"/> Unresolved issues are ignored or not addressed	<input type="checkbox"/> Unresolved issues are commented on, but resolution to these are not discussed	<input type="checkbox"/> Unresolved issues and their resolutions are fully justified
<input type="checkbox"/> There is little or no evidence that systematic testing is used to refine the solution	<input type="checkbox"/> There is some evidence that systematic testing is used to refine the solution	<input type="checkbox"/> There is significant evidence that systematic testing is used to refine the solution
<input type="checkbox"/> The report is lacking coherence	<input type="checkbox"/> The report is generally coherent	<input type="checkbox"/> The report is coherent

DOC



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Telephone 01223 553998

Facsimile 01223 552627

Email [general.qualifications@ocr.org.uk](mailto:general.qualifications@ocr.org.uk)

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