# Switching AQA GCSE (9-1) Computer Science to OCR GCSE (9-1) Computer Science

### Introduction

Are you currently teaching the AQA GCSE Computer Science? Are you thinking of switching? We are here to help.

We will provide you with all the support you could need to switch from the AQA GCSE Computer Science to our OCR GCSE Computer Science, including:

* Mapping of AQA’s specification to OCR’s specification
* An overview of the differences in assessment

### Our offer

* Our GCSE (9-1) Computer Science qualification has been created by our Subject Advisor team, working with a number of stakeholders including:
	+ OCR’s Computer Science Consultative Forum
	+ Teachers
	+ Assessors
	+ Higher Education Institutions
	+ Learned societies.

It has been created to be a qualification which engages students, so they achieve their full potential.

* Our GCSE team are passionate about both computer science and education. With a depth of teaching and assessment expertise, they are fully committed to supporting centres’ delivery of our GCSE qualifications.
* We have produced a wide range of support materials to make teaching and delivery as simple as possible for the teacher.
	+ **Teacher Delivery Packs**: provide lesson plans, teaching PowerPoints and lesson activities as a starting point for planning, which you may then customise to suit your learners’ needs. We also have mini multiple-choice quizzes to help check understanding along the way.
	+ **Algorithm Challenge booklet**: Designed to be used for regular homework, this allows learners to create a range of algorithms from simple to challenging, and using flow charts and pseudocode – the perfect preparation for examination technique and for the Programming Project.
	+ **Programming Challenges**: we have provided 80 scenarios that you can use to set as class coding challenges, homework, or teaching tools.
	+ **End of unit quizzes**: Building on our formative multiple-choice quizzes, we have developed short answer quizzes to help evaluate end of topic learning. These are comprehensive and provide excellent preparation for answering past paper questions.
	+ **ExamBuilder**: Our free on-line practise paper builder allows you to create your own examinations, based on OCR past paper material. Our unique offer allows you to select sub-parts of questions for ultimate flexibility.
	+ **Programming Technique guides** for Python and C#: these exemplify programming techniques in these languages and provide teaching support for learners.
	+ **Endorsed Resources**: We have endorsed resources from a wide range of publishers to help support your in identifying suitable material to support your program of study. Many of these publishers also offer on-line solutions as well.
* Using your current resources should be no problem. As the DfE subject content for Computer Science is very similar for all awarding organisations, you should find that your current teaching resources/text books should support the majority of our specification content requirement as well. We have highlighted any differences below!
* Our wide-ranging **e-Communities** exist not only within Computer Science, but also across our other IT qualifications – such as Cambridge Nationals in Creative iMedia and Information Technologies. If you decide to join us, you will be able to access a computer science Facebook community with over 3,000 existing members.
* Teacher Networks allow you to meet local teachers face-to-face and speak with an OCR Computer Science Subject Advisor. Last year we offered 35 teacher networks and met over 300 teachers. This is on top of the wide range of external events we attend, such as conferences, CAS meetings etc. We are here, and listen to you to help you get the best results for your students.
* Dedicated team of **3 Subject Advisors** to answer your questions. We are the only awarding organisation to currently offer a team of 3 Subject Advisors to help you from starting teaching, to examination results. All of our team are ex-teachers and have a depth of assessment knowledge.

### Key similarities

**The structure** of both AQA and OCR GCSEs in Computer Science are similar. Both offer 2 written examinations (currently worth 50% of the final grade) and a requirement to undertake a Programming Project to consolidate practical skills.

**The examinations** are both 1.5 hours and worth 80 marks. One examination paper is focused on theoretical concepts/computer systems, and the other on programming and algorithms.

### Content Variations

Below is a table to show the key variations between AQA GCSE Computer Science and OCR GCSE Computer Science content. If not mentioned – the rest of the content is similar.

| **Topic** | **AQA Specification content** | **OCR Specification content** |
| --- | --- | --- |
| **Searching and Sorting Algorithms** | Requirement to be able to compare and contrast linear and binary searching algorithms.Requirement to be able to compare and contrast merge and bubble sort algorithms. | OCR does not require candidates to be able to explicitly compare and contrast these algorithms. |
| **Mathematical Operations** | AQA does not require knowledge of exponentiation. | OCR requires knowledge of exponentiation, in addition. |
| **Use of procedures and functions** | AQA has explicit requirements of more technical knowledge of procedures and functions. | OCR does not explicitly state level of detail within the specification. |
| **Units** | AQA expects knowledge of bytes and the prefixes of kilo, mega, giga and tera. | OCR includes ‘nibbles’ as they are used in hexadecimal conversions and petabytes in addition. |
| **Software** | AQA expects knowledge on both application and system software | OCR only covers system software. |
| **Processor Architecture** | AQA has a general understanding of Von Neumann architecture. | OCR covers more specific processor architecture, such as Registers, Program Counter and Accumulator in addition. |
| **Memory** | AQA covers ‘main memory’, secondary storage, RAM and ROM.AQA includes understanding of operation of a range of storage types and ability to discuss advantages and disadvantages. | OCR covers virtual memory and flash memory in addition.OCR specifically required discussion of advantages and disadvantages with respect to capacity, speed, portability, durability, reliability and cost. |
| **Networks** | AQA requires knowledge of PAN/WAN/LAN.AQA requires study of bus and star network topologies.AQA covers network security.AQA cover the concepts of layers with relation to TCP/IP. | OCR does not require knowledge of PANs.OCR requires a higher level of detail within wireless networkingOCR does not look at Bus network topologies, but does require mesh network topologies instead.OCR covers network security but is explicit in the threats that we expect to be covered.OCR expects a more general knowledge of layers and their uses. |
| **Cyber Security** | AQA covers cyber security.AQA covers penetration testing. | OCR covers cyber security and states a list threats that we expect to be covered.OCR covers penetration testing and states a list threats that we expect to be covered. |
| **Ethical, Legal, Environmental and Cultural** | AQA covers Ethical, Legal, Environmental and Cultural impacts/issues. | OCR is similar and has a more precise list of specific legal frameworks/laws that cover the use of computers/data. |

**Content Differences**

Below is a table to show the key differences between AQA GCSE Computer Science and OCR GCSE Computer Science content.

| Topic | AQA Specification content | OCR Specification content |
| --- | --- | --- |
| Algorithms | Ability to explain algorithms in terms of input, output and processing.Understand that there is often more than one way to solve a problem.Compare the efficiency of algorithms. | Knowledge of the Insertion sorting algorithm. |
| Programming Techniques | Be able to use random number generation.Describe and explain the advantages of a structured approach to programming. | Use of SQL to search for data (limited command set given in specification).Anticipating misuse of programs/code and build in protection against it.Maintainability of code, including commenting and indentation.Purpose and types of testing and identification of syntax and logic errors. |
| Programming Languages | Know about and be able to differentiate between machine code and assembly language. |  |
| Using an Integrated Development Environment |  | Knowledge of the tools within an IDE to aid programming. |
| Mathematical Operations | Know about/describe situations where binary shifts can be used.Explain why hexadecimal is often used in computer science. |  |
| System Architecture | Define hardware and software and understand the relationship between them. |  |
| Compression | Explain and interpret Huffman trees.Calculate the number of its needed to store Huffman coded data and uncompressed ASCII.Explain how Run Length Encoding can be usedRepresent data in Run Length Encoding frequency/data pairs. |  |
| Data Storage | Understand that character codes are commonly grouped and run in sequence within encoding tables.Calculate bitmap file sizes based on number of pixels and colour depth.Convert binary data into black and white images, and vice versa.Calculate file sizes based on sampling rates and sample resolution.Explain the term cloud storage.Explain disadvantages/advantages between cloud storage and local storage. | The use of metadata within image files. |
| Networks | Define and discuss computer networks including their benefits and risks.Define what a ‘network protocol’ is. | Factors that affect network performanceClient-Server v. Peer-Peer networksHardware needed to connect computers to a network.The Internet – including DNS, hosting and ‘The Cloud’.Virtual networks.Differences between Wi-Fi and EthernetPacket switching as a part of data transmission. |
| Processor Architecture |  | We require an overview of the purpose of the CPU. |

### Want to switch to OCR?

If you’re an OCR-approved centre, all you need to do is download the specification and start teaching. Your exams officer can complete an intention to teach form which enables us to provide appropriate support.

When you’re ready to enter your students, you just need to speak to your exams officer to make the **final entries by 21st February** of the year of examination series. If you are not already an OCR-approved centre, please refer your exams officer to the centre approval section of our admin guide.

### Follow our ‘Quick Start’ guide

**Follow this quick start guide**

This guide is intended to support teachers who are new to our GCSE (9-1) Computer Science. You may be starting delivery of the subject for the first time, or moving to us from another examination board.

This guide will direct you to the sources of information that you will need and suggest steps to take to help familiarise yourself with the range of support materials we produce, and where to find them.

**Specification Familiarisation**

**1**

You may find our ‘Specification at a Glance’ is a good place to start to become more familiar with the general content requirements of our specification. This may be found here:

* <http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/specification-at-a-glance/>

The Specification is located on the Subject Web Page

* <http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/>

A direct link to the specification for download is here:

* <http://www.ocr.org.uk/Images/225975-specification-accredited-gcse-computer-science-j276.pdf>

**Stay informed**

**2**

To ensure you stay informed of any updates to our qualifications, or if you have questions about the specification or its delivery, then we would recommend the following depending on your need.

* **Let us know you are planning to teach our qualification**

This will help us keep you supported and informed as you begin to deliver the qualification. To do this, complete an [Intention to Teach](http://www.ocr.org.uk/qualifications/expression-of-interest/) form.

* **Register for Subject Update emails**

We produce regular e-Newsletters which contain information on changes, resources and updates to our qualifications. Register for these by [completing this form](http://www.ocr.org.uk/qualifications/email-updates/).

* **Subject Information Updates**

We send critical updates to all centres via your Examinations Officer. Subject Information Updates are found under the [Assessment](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/) section of the subject web page.

**Preparing to Teach**

**3**

We have a range of resources and training that will help you prepare and plan your course. The following links will direct you to the most relevant support route for your needs.

**CPD Courses**

We offer a range of [CPD Courses](https://www.cpdhub.ocr.org.uk/DesktopDefault.aspx?e=fjefcbdbhgnidcpoonie&CATN_ID=1) for our qualifications. Our range of courses will help you to understand the Specification in more depth and develop your confidence in delivery of the course.

We offer training at either Face to Face events, or with webinars. This allows you to either meet our trainers and other teachers directly, or where attendance at a face to face event proves challenging, remotely via our webinars.

**Scheme of Work builder**

Scheme of Work builder is a free on-line tool. It will help generate the scaffolding for your medium and long term planning. You may find the Scheme of Work builder [here](https://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/scheme-of-work-builder/).

Due to the way GCSE (9-1) Computer Science is resourced, this should be used in Conjunction with our Teacher Delivery Packs.

**Teacher Delivery Packs**

We provide a total set of [lesson plans and resources](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/planning-and-teaching/) for you to use – free of charge. We call these ‘Teacher Delivery Packs’. These packs cover Lesson Plans, PowerPoints, Learning Activities and Multiple Choice questions (among other things) and are ‘ready to use’. These provide a great starting point for your planning.

**Endorsed Resources**

We offer a range of [endorsed text books and e-resources](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/textbooks/) for you to choose from. Many publishers offer inspection copies and trials of their resources.

**Preparing for Options Evenings**

**4**

We have a range of media that may support you during your options evening to both attract candidates to undertake Computer Science at GCSE and show them what they will be studying. You may find the following useful:

1. **Sample Assessment Materials**We have a [taster booklet](http://www.ocr.org.uk/Images/290191-sample-assessment-materials-taster-booklet.pdf) of assessment questions and examples of the [Component 01](http://www.ocr.org.uk/Images/226764-unit-j276-01-computer-systems-sample-assessment-materials.pdf) and [Component 02](http://www.ocr.org.uk/Images/226630-unit-j276-02-computational-thinking-algorithms-and-programming-sample-assessment-materials.pdf) examination papers. These will help candidates see how they will be assessed.
2. **Computing Summary Brochure**We have a broader [summary document](http://www.ocr.org.uk/Images/268867-computing-summary-brochure.pdf) that covers all of our Computing qualifications. This will also be of use to you if you offer other OCR L1/L2 Computing qualifications.
3. **Parents and Student Guide**We have a [Parents and Students](http://www.ocr.org.uk/Images/350596-parents-and-students-guide.pdf) guide, which has further information. This may be used as a handout during options evening. You may print the relevant pages from this document.
4. **Computer Science Posters**We have a generic Computer Science [poster](http://www.ocr.org.uk/Images/288120-ocr-computer-science-poster.pdf) available for you to use. You may also like our career pathways posters. The [Software Architect](http://www.ocr.org.uk/Images/349670-software-architect.pdf) poster specifically relates to the GCSE, but the [Data Analyst](http://www.ocr.org.uk/Images/349680-data-analyst.pdf) and [Game Designer](http://www.ocr.org.uk/Images/349667-game-designer.pdf) ones highlight other pathways through our qualifications.

**Staying supported**

**5**

There are many ways to engage with OCR and fellow teachers.

* **Attend one of our free Teacher Networks**This is your chance to meet one of our Subject Advisors Face to Face. You will also meet local centres who are delivering our qualifications, which helps to build local support networks. We hold regular teacher networks across the country. You can register for a place at your nearest Teacher Network via <https://www.eventbrite.co.uk/o/ocr-7732496215>.
* **Ask a question to OCR’s Subject Advisor Team**We have a range of ways to contact out Subject Advisor team to help support you and clarify any questions you may have. You may contact the Subject Advisor team via:
1. Telephone: 01223 553 998
2. Email: ComputerScience@ocr.org.uk
3. Twitter: @OCR\_ICT
* **Join the Facebook community**There is a community of over 3,000 teachers on [Facebook](https://www.facebook.com/groups/266581410111152/) teaching our GCSE (9-1) Computer Science course. There is a wide and varied discussion, with many teachers providing resources and/or advice and guidance on their approach to delivery. Our Subject Advisors are also present within the community to offer additional support.

Should you choose to join – please ensure you complete the application questions!

**Preparation for your candidates**

**6**

There is a range of ways to prepare your candidates in preparation for either the formal examinations, or for undertaking the Programming Project.

We offer a wide range of free resources to support assessment and learning.

**Preparing for the Programming Project**

The Programming Project requires 20 hours of timetabled time to complete. You should read the Specification and the Programming Project guide which is available through [Assessment section](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/) of the subject web page.

Please note that completion of the Programming Project is a **formal requirement** of the GCSE (9-1) GCSE, even though it does not form part of a candidate’s final grade.

The following resources may help in developing candidates coding and skill base in preparation for the Programming Project:

* **Coding Challenges Booklet**
The [Coding Challenges booklet](http://www.ocr.org.uk/Images/260930-coding-challenges-booklet.pdf) provides a wide range of coding challenges that students can use as practice to get used to the process of Analysis, Design, Development and Testing of real-world problems.
* **Pseudocode Reading**[Pseudocode Reading Exercises](http://www.ocr.org.uk/Images/341229-pseudocode-explanation-sheet.docx) help to build candidates’ confidence in reading and understanding pseudocode.
* **Algorithm Challenges**
Our[Algorithm Challenges](http://www.ocr.org.uk/Images/400714-algorithm-challenge-booklet-teachers-guide.docx) booklet provides 40 algorithm challenges which help build confidence in creating algorithms from real-life problems. They are graduated from very simple to complex!
* **Programming Techniques guides**
We have guides to the programming techniques in the specification for both [Python](http://www.ocr.org.uk/Images/390478-programming-techniques-python-teacher-guide.docx) and [C#](http://www.ocr.org.uk/Images/398694-programming-techniques-c-teacher-guide.docx).
* **End of Unit quizzes**We have quizzes which test candidates understanding of the [Algorithms](http://www.ocr.org.uk/Images/399196-2.1-algorithms-end-of-unit-quiz-lesson-element.docx) and [Programming Techniques](http://www.ocr.org.uk/Images/399197-2.2-programming-techniques-end-of-unit-quiz-lesson-element.docx) units within the specification.

**Preparing for the external Examinations**

We have a wide range of assessment preparation material for the external examinations.

* **Multiple Choice Questions**These are included inside the Teacher Delivery Packs and give ability for formative assessment to take place at the end of each lesson or section.
* **End of Unit Quizzes**
The End of Unit quizzes allow you to set candidates questions with more depth to them to really assess the strength of their understanding. These could also be used for homework/revision questions.
* **ExamBuilder**
We offer a free on-line service called [ExamBuilder](http://www.ocr.org.uk/qualifications/past-papers/exambuilder/). This service allows you to create mock examination papers sourced from historical assessment material. You may need to ask your Exams Officer to sign up on behalf of the school to get an account.
* **Practice Papers**
We have an external set of Sample Assessment Materials within the [Assessment](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/) section of the J276 web page.

We have also created a second set of papers for use as unprepared mocks which are located behind [Interchange](https://interchange.ocr.org.uk/Downloads/Computer-Science-J276-from%2B2016-practice-papers.zip?downloadId=750092). Your exams officer should be able to give you access to Interchange.

* **Examiners’ Report**
After each examination series, the Examiners’ Report reviews the examination series and often highlights common issues and strengths with the series. These reports can provide valuable insight for examination preparation. The report is available from the [Assessment](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/) section of the J276 web page.
* **Forms**
Any forms you will require for entry of candidates may be found under the ‘Forms’ menu within the [Assessment](http://www.ocr.org.uk/qualifications/gcse-computer-science-j276-from-2016/assessment/) section of the J276 web page.

We’d like to know your view on the resources we produce. By clicking on ‘Like’ or ‘Dislike’ you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click ‘Send’. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: [www.ocr.org.uk/expression-of-interest](http://www.ocr.org.uk/expression-of-interest)

Looking for a resource? There is now a quick and easy search tool to help find free resources for your qualification: [www.ocr.org.uk/i-want-to/find-resources/](http://www.ocr.org.uk/i-want-to/find-resources/)

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OCR acknowledges the use of the following content: n/a

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