Switching to AQA GCSE Computer Science from Cambridge OCR

This guide compares our GCSE Computer Science (8525) specification with the Cambridge OCR Level 1/Level 2 GCSE (9-1) in Computer Science (J277) to help you make the right choice for your learners. At the end of the document, you will find links to further support and helpful resources.

Assessment structure

Option/entry codes

AQA GCSE Computer Science	Cambridge OCR GCSE Computer Science
8525A (C#), 8525B (Python), 8525C (VB.NET) 8525/1A, B or C	J277

Paper 1

AQA GCSE Computer Science	Cambridge OCR GCSE Computer Science
Title: Computational thinking and programming skills	Title: Computer systems
Assesses computational thinking, code tracing, problem-solving, programming concepts including the design of effective algorithms and the designing, writing, testing and refining of code	Assesses systems architecture, memory and storage, computer networks, connections and protocols, network security, systems software, ethical, legal, cultural and environmental impacts of digital technology
Written paper: 2 hours 90 marks 50% of GCSE	Written paper: 1 hour and 30 minutes 80 marks 50% of GCSE
Mix of multiple choice, short answer and longer answer questions assessing programming, practical problem-solving and computational thinking skills Learners answer questions using one of the following: C#, Python (version 3), VB.NET	Mix of multiple choice, short answer and longer answer questions assessing programming, practical problem-solving and computational thinking skills

Paper 2

AQA GCSE Computer Science	Cambridge OCR GCSE Computer Science
Title: Computing concepts	Title: Computational thinking, algorithms and programming
Assesses data representation, computer systems, computer networks, cyber security, relational databases and SQL, ethical, legal and environmental impacts of technology	Assesses algorithms, programming fundamentals, producing robust programs, Boolean logic, programming languages and Integrated Development Environments
Written paper: 1 hour 45 minutes 90 marks 50% of GCSE	Written paper: 1 hour and 30 minutes 80 marks 50% of GCSE
Mix of multiple choice, short answer, longer answer and extended response questions assessing SQL programming skills and theoretical knowledge	Two sections In Section B, questions answered using either the Cambridge OCR Exam Reference Language or any high-level programming language

Summary of key differences

The following tables give a high-level summary of some key differences between the two qualifications. This list is not comprehensive but highlights the differences we think will be most important for you and your learners. In some areas this may be a difference in terminology only.

AQA Paper 1 – Computational thinking and programming skills

The topics of logic gates, SQL and translators are tested on Paper 2.

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Designing algorithms	Structure diagrams Cambridge OCR Exam Reference Language	Understand that more than one algorithm can be used to solve the same problem Compare the efficiency of algorithms explaining how some algorithms are more efficient than others in solving the same problem
Sorting algorithms	Insertion sort	
Additional programming techniques	The use of basic file handling operations: • open • read • write • close	
Testing	Types of testing: • iterative testing • final testing	
Integrated Development Environment	Common tools and facilities available in an IDE: • editors • error diagnostics • runtime environment	

AQA Paper 2 – Computing concepts

The topics of logic gates, SQL and translators are tested on Paper 2.

Fundamentals of data representation

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Units of information	Data capacity calculation of data capacity requirements Metadata Units of data includes petabytes	
Binary arithmetic	Add **two** binary numbers Overflow errors	Add **three** binary numbers
Data compression	Types of compression: • lossy • lossless	Explain how data can be compressed using Huffman coding and be able to interpret Huffman trees Calculations of file sizes of compressed data using Huffman coding and uncompressed data in ASCII Explain how data can be compressed using run length encoding (RLE) and represent data in RLE frequency/data pairs
Character sets and images	8-bit ASCII	7-bit ASCII Converting bitmap images into binary and vice versa

Computer systems

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Boolean logic		XOR gate
CPU architecture	Von Neumann architecture: • MAR • MDR • program counter • accumulator	Explain the role and operation of the following major components of a central processing unit (CPU): • clock • bus

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Operating system and software	Utility software: • encryption software • defragmentation • data compression	Define the terms hardware and software Explain what is meant by system software and application software; give examples of both types of software
Languages and translators		Low level languages – differences between machine code and assembly languages An assembler is a type of translator
Storage	Virtual memory Optical storage	

Fundamentals of computer networks

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Topologies	Star and mesh network topologies	Personal area network
Networks	Factors that affect the performance of networks Roles of computers in a client server and a peer-to-peer network Hardware needed to connect stand-alone computers to a local area network Internet as a worldwide collection of computer networks: • DNS • hosting	
Protocols and layers	Ethernet and Wi-Fi IP addressing Standards FTP POP	Name and describe the layers on the TCP/IP model Understand which protocols operate at each layer
Network security	Brute force attacks Denial of service attacks Data interception and theft Concept of SQL injection	Misconfigured access rights Removal media Unpatched/outdated software

Cyber security

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Cyber security	Anti-malware software User access levels Physical security	Pharming Blagging Shouldering Security measures: • biometric measures • password systems • CAPTCHA • using email confirmations to confirm a user's identity • automatic software updates

Relational databases and SQL

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Relational databases and SQL		Explain the concept of a relational database including the use of primary and foreign keys Understand that the use of a relational database facilitates the elimination of data inconsistency and data redundancy Use SQL to insert data, edit data and delete data in a database

Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy

Topic	What you will no longer need to teach (Cambridge OCR J277)	What you will now teach (AQA 8525)
Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy	Cultural issues Legislation relevant to computer science: • Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • software licences (i.e. open source and proprietary)	

AQA pseudo-code and Cambridge OCR Exam Reference Language

At AQA, we use a consistent style of pseudo-code in all assessment material. This is clearly described in Notes and guidance: Pseudo-code which will ensure that, with enough preparation, learners will understand the syntax of the pseudo-code used in assessments. Learners do not have to use this style of pseudo-code in their own work or written assessments, although they are free to do so. The only direction to learners when answering questions or describing algorithms written in pseudo-code is that their code is clear, consistent and unambiguous. This resource may be updated as required and the latest version will always be available on our website. It is not confidential and can be freely shared with learners.

Cambridge OCR uses a set of commands known as Exam Reference Language to frame their exam questions to maintain clarity and consistency.

Programming languages

- At AQA, we produce papers specific to C#, Python or VB.NET. Programming questions are always clear when the use of the specific language is required to answer them.
- Cambridge OCR permits the use of any high-level programming language, and questions are written in Cambridge OCR Exam Reference Language to remain language agnostic.

Helpful resources

- AQA GCSE Computer Science specification.
- AQA Professional Development: online live and on-demand training courses, including Mark scheme guidance and application and Preparing for next year, as well as courses on getting the most from your results with our Data Insights tool.
- Teaching resources: including lesson activities, schemes of work, subject specific vocabulary and teaching guides as well as links to the approved textbooks.

For further support, contact us on computerscience@aqa.org.uk

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