Department for Education

GCSE Computer Science

Proposed Subject Content

Government consultation response

31 March 2025

Contents

Introduction

The previous government commenced a review of the computer science GCSE subject content to identify and remove content that had become dated, and to propose some further additional changes. A nine-week consultation on the proposed computer science GCSE subject content was launched on 20 May 2024, which closed on 24 July 2024. Whilst there was broad support for many of the proposed updates, the majority of respondents raised concerns in relation to changes that were more substantial. This document sets out a summary of views from the consultation and this government's response. All responses were analysed by the Department for Education (DfE).

GCSE computer science is designed to equip pupils with the knowledge they will need for the technological jobs of the future and supports progression into further education or employment. Students are taught how to understand and apply the fundamental principles and concepts of computer science, how to analyse problems in computational terms, and to write programs. Other areas of study include the components that make up digital systems, aspects of cyber security, how to apply relevant mathematical skills and the impacts of digital technology to the individual and to wider society.

GCSE subject content sets out the knowledge, understanding and skills common to all GCSE specifications in a given subject. Together with the assessment objectives it provides the framework within which the awarding organisations create the detail of their specifications. The current computer science GCSE subject content was published in January 2015, and, since that time, digital technology has advanced, meaning some content has become dated.

Since the consultation launched, the new government has established an independent Curriculum and Assessment (C&A) Review, covering ages 5 to 18, chaired by Professor Becky Francis CBE. The C&A Review will seek to deliver a curriculum that readies young people for life and work, building the knowledge, skills and attributes needed to thrive. This includes considering how young people will acquire the key digital skills needed for future life and developing an assessment system that captures the strengths of every child and young person and the breadth of curriculum, with the right balance of assessment methods, whilst maintaining the important role of examinations.

The C&A Review published its Interim Report on 18 March, having considered evidence from more than 7,000 young people, parents, teachers, employers and education experts, who provided insight into how the curriculum and assessment system can ensure all young people are prepared for life and work. The Review's Interim Report sets out that many aspects of the curriculum and assessment system are working well but are not delivering for every child. The next phase of work will focus on four key areas:

- **Ensuring high standards for all** - exploring how curriculum and assessment can be more inclusive and equitable, to ensure excellence for all.
- **Addressing subject-specific challenges, and ensuring curriculum is consistently achieving depth and breadth** – including an in-depth analysis of individual subjects to ensure appropriate depth and mastery of knowledge, and that subjects are cutting edge.
- **Responding to social and technological change** - examining how education can better prepare students to grasp the opportunities of the future, for example heightened digital skills and media literacy to address trends in digital information

and the rise of AI, and scientific and cultural knowledge to meet the challenges of climate change.

- **Ensuring pathways beyond GCSE work for all** - examining the current pathways to ensure they work for all young people in supporting successful routes to further study or employment, especially those from less privileged backgrounds.

The department will also be appointing a task and finish group to advise on digital, AI and technology in order to increase the future pipeline of talent with digital and AI specific skills and prepare children and young people to be ready for an AI and tech-enabled world, as well as making the most of opportunities to use AI and educational technology to drive better teaching and learning. A final C&A Review report with recommendations will be published in the autumn, and the department will take decisions on what changes to make to the curriculum in light of the recommendations.

Considering both the responses to the computer science GCSE subject content consultation, and the ongoing C&A Review, this government is keen not to impose successive changes on schools and the teaching workforce which may create unnecessary burdens. To minimise disruptive changes to curriculum content should the C&A Review recommend further work in this subject area, the government has decided to limit the changes to be made to the subject content in computer science GCSE at this point to five elements of dated content only. This approach seeks to improve the freedoms that awarding organisations have in creating computer science GCSE specifications that are relevant to today's pupils, and which equip them with the knowledge and skills they will need in the future.

Summary of responses received and the government's response

The 'Computer science GCSE subject content consultation' was launched on 20 May 2024 and closed on 24 July 2024. In total, the consultation received 454 responses, from 347 individuals and 107 organisations.

The DfE consulted on six questions. Given this refresh has been superseded by the C&A Review, the department will proceed only with the five revisions as set out below:

1. The removal of "inside computers" at the end of the "representation of text, sound and graphics **inside computers**."

   This removal recognises that the term *'inside computers'* implies a physical location, which may inhibit coverage of cloud computing within awarding organisations' specifications;

2. The removal of "including Von Neumann" within "CPU architecture, **including Von Neumann** and the role of the components of the CPU in the fetch-execute cycle."

   This removal reflects varying views on the continued relevancy of von Neumann architecture and makes its inclusion within specifications optional.

3. The removal of the given examples (in bold) within "main and contemporary secondary storage and ways of storing data on devices **including magnetic, optical and solid state."**

   These removals reflect varying views on the continued relevancy of some the given examples and provides awarding organisations with the freedom to choose their own exemplifications.

4. The removal of **"common network topologies"**.

   This removal recognises that these change frequently, and no longer play a significant role, limiting their value.

5. The removal of the stated examples (in bold) in "the concept of networking protocols, **including Ethernet, Wi-Fi, TCP/IP, HTTP, HTTPS, FTP and email protocols**."

   These removals reflect varying views on the continued relevancy of some of the given examples and provides awarding organisations with the freedom to choose their own exemplifications.

These changes will apply to computer science GCSE exams taking place in the summer of 2027 onwards. Students taking a computer science GCSE exam before this date will not experience any changes to their programmes of study.

For transparency, this document provides an analysis of consultation responses received against the subject content originally proposed.

Main findings from the consultation

Subject content

We asked

Is the proposed new introductory paragraph clear and unambiguous?

We heard

The majority (88%) of respondents agreed that the proposed introductory paragraph was clear and unambiguous. Of the 12% that did not agree, their concerns related to it being vague or generic, and that further definition was required for some of the terms.

We asked

Is the knowledge and understanding set out in this section clear and unambiguous?

We heard

The majority (81%) of respondents agreed that the knowledge and understanding was clear and ambiguous. Of the 19% that did not agree, several respondents asked for further detail on what technologies should, and shouldn't, be taught within the content. Others questioned what should be taught with regard to AI and expressed that teachers would need additional support to confidently teach this topic.

We asked

Do you support the opportunity for visual programming languages to be used in meeting the GCSE's programming requirements, in addition to textual ones?

We heard

38% of respondents supported the opportunity for visual programming languages to be used in addition to textual ones. Of the 62% that did not agree, many respondents expressed that textual languages were important for future study and careers, and that visual languages were not sufficiently rigorous for GCSE study. Some suggested it was not possible to learn the full range skills through visual languages e.g., debugging of syntax errors. There were also questions relating to how visual languages would be assessed and the potential impact on the transition from computer science GCSE to computer science A level, where textual languages are currently specified.

We asked

Do you agree that computer science students whose GCSE programming study is completed using a visual, rather than textual, programming language, will not be disadvantaged on progression to A level study, which mandates textual programming?

We heard

The majority of respondents (79%) did not agree, and many respondents expressed a concern that the transition for pupils moving from a visual language at GCSE to a textual language at A level would be too difficult. Several also raised that settings receiving A level students may find it challenging to effectively teach a cohort with a mix of pupils with prior experience in visual and textual languages, and the negative impact this could have on teacher workloads. 21% did agree, and of those, many agreed that the underpinning knowledge of programming could be transferred across languages, whether they were textual or visual.

Skills

We asked

Is the Skills section of the subject content clear and unambiguous?

We heard

76% of respondents agreed that the proposed Skills section was clear and unambiguous. Of the 24% that did not agree, many said the terms used were vague, and that there was too much focus on decomposition and abstraction. Some felt that the section lacked detail or wanted to know if practical programming was required.

Equalities

We asked

Do any of the proposals have the potential to have a disproportionate impact, positive or negative, on specific groups, in particular those who share a 'protected characteristic' (age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation)?

We heard

The majority (83%) of respondents said that the proposals do not have the potential to have a disproportionate impact on specific groups. This question allowed respondents

to provide written feedback via a free text box on how the proposed subject content could be altered, on this basis. Of the 17% that said it would have an impact, some felt that the inclusion of visual languages could positively support pupils with dyslexia, whilst others were concerned about visually impaired pupils and those with physical disabilities impairing their ability to ‘drag’ blocks of code. Many respondents said that the proposed changes would not address the issues of gender balance in computing.

Government response

Following the department’s careful consideration of all the responses, and the views of the computer science expert review group which informed the review, Ministers have decided that the department will publish a revised version of the computer science GCSE subject content which removes five areas of text that have become dated or are of decreasing relevance. This will ensure that the teaching of these specific items is no longer mandated by the department, and that awarding organisations have greater freedom in keeping their specifications up to date and relevant for students.

GCSEs in all subjects will be considered by the C&A Review, and we look forward to their findings, and recommendations, in Autumn 2025.

Next steps

This government remains committed to ensuring that all children, regardless of their background, have excellent digital and computing knowledge for future employment and study.

This government will proceed with the following changes to the GCSE subject content:

- The removal of “inside computers” at the end of the “representation of text, sound and graphics **inside computers**.”
- The removal of “including Von Neumann” within “CPU architecture, **including Von Neumann** and the role of the components of the CPU in the fetch-execute cycle.”
- The removal of the stated examples on “main and contemporary secondary storage and ways of storing data on devices **including magnetic, optical and solid state.”**
- The removal of **“common network topologies.”**
- The removal of the stated examples on “the concept of networking protocols, **including Ethernet, Wi-Fi, TCP/IP, HTTP, HTTPS, FTP and email protocols**.”

This government will not proceed with the other changes consulted on.

Should the government require changes to the computer science subject content at any future date, including in the light of the recommendations of the C&A Review, this will be subject to new consultation.

Department for Education

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