GCSE Computer Science Qualification Outline – Consultation Version

Introduction

This document provides a high-level overview of the proposed WJEC GCSE Computer Science qualification.

It is based on Qualifications Wales's Approval Criteria (key sections are included in Appendix 1). Our qualification **must** meet these requirements.

The qualification outline will provide a guide for the development of the Specification and Sample Assessment Materials (SAMs).

Qualification overview

The GCSE Computer Science qualification will support the Curriculum for Wales by:

- Supporting the statements of what matters[1], giving learners the opportunity to
    - develop and test models
    - consider the social, professional, ethical, environmental and legal impact of systems and the use of technology
    - become enterprising, real-world problem solvers through developing skills in computational thinking.

- Supporting the principles of progression[2]
    - by encouraging iterative problem solving and design
    - explore and experience increasingly complex ideas (for example in programming tasks in the pre-release brief that are further refined and expanded upon in the examination).

- Supporting the specific considerations for this area[3] by giving learners the opportunity to:
    - learn about the design, development and application of technology, software and systems
    - build understanding of how technologies can impact learners' lives and future careers.

The GCSE Computer Science qualification will also be based on the following computer science concepts based on the topics listed in 6-8 of the published Approval Criteria:

- computer architecture
- structure of systems and function
- how systems communicate
- security
- problem solving
    - algorithmic
    - functional decomposition
- programming
- language and compilers
- logical operations
- operating systems

[1] Science and Technology: Statements of what matters - Hwb (gov.wales)
[2] Science and Technology: Principles of progression - Hwb (gov.wales)
[3] Science and Technology: Designing your curriculum - Hwb (gov.wales)

- systems development life cycle

The subject content of the GCSE Computer Science qualification will also include a range of legal, social, ethical, environmental and professional dimensions that are relevant to and integrated with the topic areas above.

The GCSE Computer Science qualification will also include content relating to the evolution of technologies that are relevant to the topics outlined above, where appropriate.

Proposed Qualification Structure

Unit 1: Understanding Computer Science Digital only examination 50% of qualification
Unit 2: Computer Programming **On-screen examination based on a pre-released brief** **50% of qualification**

This is a unitised qualification.

Unit Information

Unit 1

The purpose of this unit is to:

- **introduce learners to the key concepts and computational processes[4] to be explored throughout the course**
- **consider the broad legal, social, ethical, environmental and professional consequences relevant to the use of technology[5]**
- **consider the evolution of technologies that are relevant to the topics**
- **include core topics that will set the context for the course.**

This unit will be based on the following concepts and topics:

- Computer architecture
    - Components
    - Peripheral devices
    - Storage
- Structure of systems and functions
    - Data types, including representation, storage and compression
    - Data and file structures
    - Automated systems
- How systems communicate
    - Networks and infrastructure

[4] Science and Technology: Statements of what matters - Hwb (gov.wales)
[5] Science and Technology: Statements of what matters - Hwb (gov.wales)

    - Cybersecurity and personal privacy
- Algorithms
- Software
    - Principles of programming
    - Software development, including the systems development lifecycle (SDLC)
    - Program construction
- Logical operations
- Operating systems
- Systems development lifecycle

Legal, social, ethical, environmental and professional dimensions and reference to the evolution of technologies will be integrated where appropriate into the above topics.

The unit will be assessed via a digital only examination, marked by WJEC, that will be worth 50% of the qualification. We are suggesting an examination no longer than 1 hour and 45 minutes.

The examination will first be available in 2026.

The assessment objectives will be targeted as follows:

AO1	AO2	AO3
30%	15%	5%

There will be no optionality, tiering or pre-release.

Unit 2

The purpose of this unit is to:

- **Explore the concept of programming**
- **Develop programming skills using Python as the specified language**
- **Encourage iterative problem solving and design**
- **Develop the use of data modelling skills**
- **Give learners the opportunity to build appropriate user interfaces**

This unit will be based on the following concepts and topics:

- Investigation
    - Decomposition
    - Abstraction
    - Pattern recognition
- Design
    - Algorithms

    - Data modelling
- Implementation
    - Programming
    - User interfaces
- Testing
- Refinement including evaluation

The unit will be assessed via an on-screen examination, marked by WJEC, that will be worth 50% of the qualification. We are suggesting an examination no longer than 2 hours.

The language used in the examination will be Python.

This examination must be completed in the final year of study. The examination will first be available in 2027.

The assessment objective will be targeted as follows:

AO1	AO2	AO3
0%	25%	25%

There will be no optionality and no tiering.

The examination will be based on a pre-release brief as prescribed by the Approval Criteria. The pre-release will be issued to learners in the academic year before the assessment is scheduled to take place (for example, September 2025 for the 2027 examination).

The pre-release brief will consist of a scenario containing a list of requirements and provides information about all tasks learners must undertake both individually and in groups.

Learners may not take any work already done on the pre-release brief into the assessment as per the Approval Criteria.

A copy of the pre-release brief will be presented as part of the examination.

The examination will contain additional requirements; learners will be expected to complete these individually using a Python program that satisfies the brief and any supporting files.

Consideration of manageability, engagement, reliability and validity

In developing this proposed qualification outline, we have considered manageability, engagement, reliability and validity, and how to balance these considerations in the context of the requirements of the Approval Criteria.

The Approval Criteria requires that both assessments are conducted digitally on-screen. Whilst this may pose some potential manageability challenges, we believe that this will enhance the validity of the qualification because the construct (knowledge, skills and understanding) being measured is Computer Science; learning and assessing using a computer is therefore more engaging, relevant and meaningful. We are liaising with Qualifications Wales and Welsh Government about centre capacity to deliver on-screen assessment.

In regard to length of the examinations, we believe that 1 hour 30 minutes – 2 hours is manageable for students at GCSE level and that this length of examination will enable us to develop a valid assessment that ensures sufficient content coverage.

The Approval Criteria require that the on-screen coding assessment is based upon a pre-release which will be issued to all learners in the academic year before the assessment is scheduled to take place. Releasing the pre-release brief at the beginning of the course will give teachers flexibility in how they choose to use it. The brief will be subject to low levels of control; teachers will be free to decide how to use it. This poses potential reliability issues as there may not be consistent preparation for learners. We propose to minimise these by providing guidance to teachers in how to use the pre-release to prepare their learners. The Approval Criteria requirement that no work can be taken into the assessment will also contribute to safeguarding reliability.

To ensure reliability, we will make sure that the examined units target the same assessment objective weightings and have a consistent level of demand each series, marking criteria will be developed and assessors will be trained on how to apply them consistently.

We will continue to consider the balance of manageability, engagement, reliability and validity, at each stage of qualification development.

Appendix 1

Key information from Approval Criteria

The following information has come directly from Qualifications Wales' GCSE Computer Science - Approval Criteria - our qualification must meet these requirements.

Purpose

1. **GCSE Computer Science** must:
   - 1.1 be designed primarily for *Learners* between the ages of 14 and 16
   - 1.2 build on the conceptual understanding *Learners* have developed through their learning from ages 3-14
   - 1.3 support teaching and learning by providing appropriately broad, demanding, relevant and engaging content and assessment that relates to and supports the Curriculum for Wales, including its four purposes
   - 1.4 allow *Learners* to develop a strong foundation of knowledge, skills and understanding which supports progression to post-16 study and prepares them for life, learning and work
   - 1.5 provide meaningful, fair and accurate information on *Learner* achievement within a subject that highlights what *Learners* know, understand and can do

Aims

2. **GCSE Computer Science** must:
   - 2.1. allow *Learners* to explore a range of knowledge, skills and understanding in relation to computer science
   - 2.2. provide opportunities for *Learners* to be assessed in a variety of relevant and meaningful contexts

3. The **GCSE Computer Science** qualification must support *Learners* to:
   - 3.1. understand and apply principles and concepts of computer science
   - 3.2. explain the features and functions of systems
   - 3.3. develop skills in computational thinking
   - 3.4. model and analyse problems in computational terms in order to develop and implement strategies to solve them
   - 3.5. develop their understanding of, and ability to apply, the systems development life cycle
   - 3.6. apply relevant mathematical skills
   - 3.7. explore relevant social, professional, ethical, environmental and legal dimensions of systems

Assessment Objectives

- The assessment of the knowledge, understanding and skills required in the qualification must target the following assessment objectives in line with the indicated weightings, within a tolerance of +/- 5 percentage points.

AO1	**Demonstrate knowledge and understanding** of the key concepts and principles of computer science	30%

AO2	**Apply knowledge and understanding** of key concepts and principles of computer science	40%
AO3	**Analyse problems** in computational terms: - to make reasoned judgements - to design, program, evaluate, and refine solutions	30%

Scheme of assessment

- The **GCSE Computer Science** qualification must be unitised.
- The qualification will not be tiered.

The **GCSE Computer Science** specification must include the following assessment arrangements:

15.1 A **digital only** examination that:
- 15.1.1 accounts for 50% of the qualification
- 15.1.2 is set and awarded by the awarding body
- 15.1.3 includes item types which are enhanced by the digital testing platform
- 15.1.4 must be available in summer series of year 10 for the first cohort of *Learners*

15.2 An on-screen coding assessment that:
- 15.2.1 accounts for 50% of the qualification
- 15.2.2 is set and marked by the awarding body
- 15.2.3 is based on a pre-release brief that is issued to all *Learners* in the academic year before the assessment is scheduled to take place
- 15.2.4 must be completed in the final year of study
- 15.2.5 must allow *Learners* to test, refine, create and add code to solve an authentic, real-world computer science problem

15.3 Any work on the pre-released brief done by a *Learner* before the coding assessment:
- 15.3.1 must not be taken into the coding assessment
- 15.3.2 must not formally be assessed and must not contribute to the qualification grade