

# Assessment Criteria for the i/GCSE in Computer Science by the various UK Examination Boards – Sep 2017 onwards

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Below is a summary of the assessment components for the 4+1 Examination Boards : AQA, OCR, EdExcel, Eduqas and CIE. It is hoped that colleagues will find this useful in trying to determine which board to choose from Sep 2016 for the teaching of GCSE Computer Science.

Please note:

- If you do decide to go with CIE please note that this is an **International Examination Board** and as such your Examinations Office need to be fully compliant with the very different requirements for 'live' exams well in advance of June 2018.
- My personal thoughts/recommendations are given at the end.
- I've highlighted a couple of interesting criteria for EdExcel.

Board	Paper 1	Paper 2	Non Exam Assessment	Topics Covered
<p><b>AQA</b></p> <p><b>Syllabus 8520</b></p> <p><b>Teaching from Sep 2016</b></p> <p><b>Exams in 2018 &amp; beyond</b></p>	<p>Computational Thinking &amp; Problem Solving</p> <p>Written exam set in practically based scenarios</p> <p><b>40%</b></p>	<p>Written short &amp; long answer, extended response</p> <p><b>40%</b></p>	<p><b>One task set by AQA – changes for each cohort of students</b></p> <p><b>Available in September of the final academic year of the course</b></p> <p><b>20%</b></p>	<p><b><u>Paper 1: Computational Thinking &amp; Problem Solving</u></b></p> <ul style="list-style-type: none"> <li>• Fundamentals of Algorithms</li> <li>• Programming</li> <li>• Fundamentals of Data representation</li> <li>• Computer Systems</li> </ul> <p><b><u>Paper 2: Written Assessment</u></b></p> <ul style="list-style-type: none"> <li>• Fundamentals of Data representation</li> <li>• Computer Systems</li> <li>• Fundamentals of Computer Networks</li> <li>• Fundamentals of Cyber security</li> <li>• Ethical, legal &amp; environmental impacts of digital technology on wider society including issues of privacy</li> </ul> <p><b><u>Aspects of software development for NEA :</u></b></p> <ul style="list-style-type: none"> <li>• Design</li> <li>• Implementation</li> <li>• Testing</li> <li>• Evaluation/refining</li> </ul>

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<p><b>OCR GCSE (9-1) J276</b></p> <p><b>First Assessment 2018</b></p>	<p><b>Computer Systems</b></p> <p>Written paper</p> <p><b>40%</b></p>	<p><b>Computational Thinking, Algorithms &amp; Programming</b></p> <p><b>40%</b></p>	<p>A set task from a choice of <b>three tasks</b> that will be provided by OCR.</p> <p><b>20%</b></p>	<p><b><u>Paper 1: Computer Systems</u></b></p> <ul style="list-style-type: none"> <li>• Systems Architecture, Memory &amp; Storage</li> <li>• Networks: wired &amp; wireless, topologies, protocols &amp; layers</li> <li>• System security</li> <li>• System software</li> <li>• Ethical, legal, cultural and environmental concerns</li> </ul> <p><b><u>Paper 2: Computational Thinking, Algorithms &amp; Programming</u></b></p> <ul style="list-style-type: none"> <li>• Algorithms</li> <li>• Programming techniques</li> <li>• Producing robust programs</li> <li>• Computational logic</li> <li>• Translators &amp; facilities of languages</li> <li>• Data representation</li> </ul> <p><b><u>Software Development Cycle for NEA:</u></b></p> <ul style="list-style-type: none"> <li>• Programming techniques</li> <li>• Analysis</li> <li>• Design</li> <li>• Development</li> <li>• Testing &amp; evaluation &amp; conclusions</li> </ul>

Board	Paper 1	Paper 2	Non Exam Assessment	Topics Covered
<p><b>EdExcel (9-1) 1CP1 First teaching 2016 First Examinations 2018</b></p>	<p><b>Principles of Computer Science</b></p> <p><b>40%</b></p>	<p><b>Application of Computational Thinking Scenario based Paper Short, open &amp; extended open response questions</b></p> <p><b>40%</b></p>	<p><b>Task will be set by Pearson, released each Sep from Sep 2017</b></p> <p><b>20%</b></p>	<p><u><b>Paper 1: Principles of Computer Science</b></u></p> <p><b>This component will assess all topics.</b></p> <ul style="list-style-type: none"> <li>• Understanding of what algorithms are, what they are used for and how they work; ability to interpret, amend and create algorithms.</li> <li>• Understand the requirements for writing program code.</li> <li>• Understanding of binary representation, data representation, data storage and compression, encryption and databases.</li> <li>• Understanding of components of computer systems; ability to construct truth tables, produce logic statements and read and interpret pseudo-code.</li> <li>• Understanding of computer networks, the internet and the worldwide web.</li> <li>• Awareness of emerging trends in computing technologies, the impact of computing on individuals, society and the environment, including ethical, legal and ownership issues.</li> </ul> <p><u><b>Paper 2: Application of Computational Thinking</b></u></p> <p>The main focus of this component will be:</p> <ul style="list-style-type: none"> <li>• Understanding of what algorithms are, what they are used for and how they work; ability to interpret, amend and create algorithms.</li> <li>• Understanding how to develop program code and constructs, data types, structures, input/output, operators and subprograms.</li> </ul> <p><b>This component may also draw on:</b></p> <ul style="list-style-type: none"> <li>• Understanding of binary representation, data representation, data storage and compression, encryption and databases.</li> <li>• Understanding of components of computer systems; ability to construct truth tables, produce logic statements and read and interpret pseudo-code.</li> <li>• Understanding of computer networks, the internet and the worldwide web.</li> <li>• Awareness of emerging trends in computing technologies, the impact of computing on individuals, society and the environment, including ethical, legal and ownership issues.</li> </ul> <p><u><b>NEA Requirements:</b></u></p> <p>Students will develop a computer program. The content for this component will draw on:</p> <ul style="list-style-type: none"> <li>• algorithms, decomposition and abstraction</li> <li>• design, write, test and refine a program</li> <li>• data.</li> </ul>

Board	Paper 1	Paper 2	Non Exam Assessment	Topics Covered
<p style="text-align: center;"><b>EDUQAS</b></p> <p style="text-align: center;"><b>First Assessment 2018</b></p>	<p><b>Component 1 – Understanding Computer Science</b></p> <p style="text-align: center;"><b>50%</b></p> <p><b>Written Exam</b></p>	<p><b>Component 2 – Computational Thinking and Programming</b></p> <p style="text-align: center;"><b>30%</b></p> <p><b>On-screen</b></p>	<p><b>Component 3 – Software Development</b></p> <p><b>Task to be issued by Eduqas</b></p> <p style="text-align: center;"><b>20%</b></p>	<p><b><u>Component 1: Understanding Computer Science</u></b></p> <p>This component investigates hardware, logical operations, communication, data representation and data types, operating systems, principles of programming, software engineering, program construction, security and data management and the impacts of digital technology on wider society.</p> <p><b><u>Component 2: Computational Thinking and Programming</u></b></p> <p>This component investigates problem solving, algorithms and programming constructs, programming languages, data structures and data types and security and authentication.</p> <p><b><u>Component 3: Software Development</u></b></p> <p>This component requires learners to produce a programmed solution to a problem. They must analyse the problem, design a solution to the problem, develop a final programmed solution, test the solution and give suggestions for further development of the solution. Throughout the production of the solution learners are required to produce a refinement log that evidences the development of the solution.</p>

Board	Paper 1	Paper 2	Non Exam Assessment	Topics Covered
<b>CIE Syllabus 0478 For examination in June and November 2017, 2018 and 2019</b>	<b>Theory of Computer Science 60%</b>	<b>Practical Problem solving &amp; Programming 40%</b>	None	<p><b><u>Paper 1: Theory of Computer Science</u></b></p> <ul style="list-style-type: none"> <li>1.1 Data representation               <ul style="list-style-type: none"> <li>1.1.1 Binary systems</li> <li>1.1.2 Hexadecimal</li> <li>1.1.3 Data storage</li> </ul> </li> <li>1.2 Communication and Internet technologies               <ul style="list-style-type: none"> <li>1.2.1 Data transmission</li> <li>1.2.2 Security aspects</li> <li>1.2.3 Internet principles of operation</li> </ul> </li> <li>1.3 Hardware and software               <ul style="list-style-type: none"> <li>1.3.1 Logic gates</li> <li>1.3.2 Computer architecture and the fetch execute cycle</li> <li>1.3.3 Input devices</li> <li>1.3.4 Output devices</li> <li>1.3.5 Memory, storage devices and media</li> <li>1.3.6 Operating systems</li> <li>1.3.7 High- and low-level languages and their translators</li> </ul> </li> <li>1.4 Security</li> <li>1.5 Ethics</li> </ul> <p><b><u>Paper 2: Practical Problem solving &amp; Programming</u></b></p> <ul style="list-style-type: none"> <li>2.1 Algorithm design and problem-solving               <ul style="list-style-type: none"> <li>2.1.1 Problem-solving and design</li> <li>2.1.2 Pseudocode and flowcharts</li> </ul> </li> <li>2.2 Programming               <ul style="list-style-type: none"> <li>2.2.1 Programming concepts</li> <li>2.2.2 Data structures; arrays</li> </ul> </li> <li>2.3 Databases</li> </ul>
	<b>Non-calculator</b>	<b>Non-calculator</b> <p><b>20 out of 50 marks</b> for this paper are from questions set on the pre-release material. The pre-release material for Paper 2 will be made available to Centres the January before the June examination, and the July before the November examination. It will also be reproduced in the question paper. Candidates are not permitted to bring any prepared material into the examination.</p>		

## Personal thoughts/ recommendations based on the above:

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AQA	<ul style="list-style-type: none"> <li>• Robust topics but not too much emphasis on Computational and Algorithmic Thinking as a topic in its own right</li> <li>• Excellent support</li> <li>• Good balance of topics between 2 papers</li> <li>• NEA set by board, 1 task only – this will mean ‘n’ versions of the same task and chasing coursework. If you work in a school where activities take up a lot of the pupils’ time then it may be difficult to collect/ assess.</li> <li>• I use them for A Level – but do not use them for GCSE due to the NEA aspect</li> </ul>
OCR	<ul style="list-style-type: none"> <li>• Very robust topics</li> <li>• I’m very impressed with the contents of Paper 2</li> <li>• Having used OCR since 2002 I have to say there is still the underlying over-emphasis on the systems life cycle and its pertinence everywhere</li> <li>• NEA: Three tasks with 3 sub-tasks is very similar to the ICT Structured Tasks which OCR have been producing year upon year for AS ICT. These are excellent tasks but remember that your pupils need to be quite strong in <u>Technical Writing Techniques</u> in order to be able to land in the top mark grading band for the coursework.</li> </ul>
EdExcel	<ul style="list-style-type: none"> <li>• I find that the content of the papers do not really follow logically from each other</li> <li>• Much is replicated between the two papers</li> <li>• The rationale behind setting up the contents of assessment as they have been is completely unclear to me.</li> <li>• The NEA does use the criteria of decomposition &amp; abstraction – this is unique to this Board but I do not feel that the entire syllabus content holds together in a convincing way for me to change over.</li> <li>• Personally I don’t think I would be using this Board.</li> </ul>

Eduqas	<ul style="list-style-type: none"><li>• A very interesting collection of assessment criteria and a very interesting weighting attached to the two papers- original!</li><li>• Not only does this Board offer the standard Theory + NEA but also the CIE style 'on-screen' exam worth 30%</li><li>• This is a bonus, in my mind, since learners do need to be tested on actual 'live programming' and as far as I can see it is the only Board currently that does this – very nice 😊</li><li>• I'm very tempted to change to this Board next year!</li></ul>
CIE	<ul style="list-style-type: none"><li>• I have been using this Board since 2014 but very much hope that I'm not biased!</li><li>• The theory content is quite robust and surprisingly lends itself very well to progression to say AQA/OCR at <i>A Level</i></li><li>• The most convenient aspect is the pre-released task – very similar to AQA A Level – which requires flow charting or pseudocoding but not very original since pupils will have most likely thrashed it to death in the classroom with the teacher.</li><li>• The programming exam asks pupils to code the 3 main constructs: Sequence/ Selection/ Iteration for a given scenario and as such I put it above the other 3 boards because it requires that they think on their feet.</li></ul>