

## Key Stage 4 Overview: Computer Science Year 10

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
	<b>University Challenge:</b> Creative Engineering	<b>University Challenge:</b>	<b>University Challenge:</b>	<b>University Challenge:</b>	<b>University Challenge:</b>	<b>University Challenge:</b>
	<b>Context:</b> Software Engineering:	<b>Context:</b> Data Representation:	<b>Context:</b> Software Engineering:	<b>Context:</b> Problem Solving:	<b>Context:</b> Problem Solving	<b>Context:</b> Problem Solving:
<b>Year 10</b>	<p><b>Skills:</b></p> <p>Explain what a subroutine is. Design and create programs using subroutines. Design and create programs using subroutines and return values. Design and create programs using subroutines, return values and parameters.</p>	<p><b>Skills:</b></p> <p>Explain how video is stored digitally. Explain what a frame is. Explain how the size of a video file can be reduced using compression. Discuss different file formats for storing video. Explain what codecs are. Identify different file compression algorithms. Discuss how digital data is compressed using run-length encoding. Calculate the size of a file using run-length encoding. Discuss how digital data is compressed using Huffman coding. Calculate the size of a file using Huffman coding. Compare run-length encoding and Huffman coding.</p>	<p><b>Skills:</b></p> <p>Explain what an array is. Design and create programs that store data in 1D arrays. Design and create programs that store data in 2D arrays. Trace the bubble sort algorithm and discuss how it works. Trace the merge sort algorithm and discuss how it works. Trace the linear search algorithm and discuss how it works. Trace the binary search algorithm and explain how it works. Design and create programs that sort and search for data in 1D arrays. Design and create programs that sort and search for data in 2D arrays. Explain what a record is. Design and create programs that store data in records.</p>	<p><b>Skills:</b></p> <p>Design solutions to problems using a range of design methods. Design and create solutions to problems using a range of design methods and one programming language. Test solutions to problem using a range of design methods and one programming language. Evaluate solutions to problem using a range of design methods and one programming language. Design solutions to problems using a range of design methods and identifying components needed. Design modular solutions using a range of design methods and considering environmental impacts. Design and create modular solutions using a range of design methods, considering environmental impacts, and one programming language. Test modular solutions using a range of design methods, considering environmental impacts, and one programming language.</p>	<p><b>Skills:</b></p> <p>Design modular solutions using a range of design methods and considering environment and ethical impacts. Design and create modular solutions using a range of design methods and considering environment and ethical impacts, and one programming language. Test modular solutions using a range of design methods and considering environment and ethical impacts, and one programming language. Evaluate modular solutions using a range of design methods and considering environment and ethical impacts, and one programming language. Design modular solutions using a range of design methods and considering environment and ethical impacts, and one programming language. Design modular solutions using a range of design methods and considering environmental, ethical, legal and social impacts.</p>	<p><b>Skills:</b></p> <p>Design modular solutions using a range of design methods and considering environmental, ethical, legal and social impacts. Design and create modular solutions using a range of design methods, considering environmental, ethical, legal and social impacts and one programming language. Test modular solutions using a range of design methods, considering environmental, ethical, legal and social impacts and one programming language. Evaluate modular solutions using a range of design methods, considering environmental, ethical, legal and social impacts and one programming language. Design modular solutions using a range of design methods and considering environmental, ethical, legal and social impacts. Design and create modular solutions using a range of design methods, considering environmental, ethical, legal, social and cultural impacts.</p>

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			<p>Design and create programs that store and retrieve data from records. Explain what a file is. Design and create programs that read from text files. Design and create programs that read and create from and to text files.</p>	<p>Evaluate modular solutions using a range of design methods, considering environmental impacts, and one programming language.</p>	<p>Design and create modular solutions using a range of design methods, considering environmental, ethical and legal impacts and one programming language. Test modular solutions using a range of design methods, considering environmental, ethical and legal impacts and one programming language. Evaluate modular solutions using a range of design methods, considering environmental, ethical and legal impacts and one programming language.</p>	<p>and one programming language. Test modular solutions using a range of design methods, considering environmental, ethical, legal, social and cultural impacts and one programming language. Evaluate modular solutions using a range of design methods, considering environmental, ethical, legal, social and cultural impacts and one programming language.</p>
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