



## Year 10 Curriculum Overview

**Rationale:** The Year 10 curriculum is designed to introduce students to the central processing unit (CPU), computer memory and storage, data representation, wired and wireless networks, network topologies, system security and system software. It also looks at ethical, legal, cultural and environmental concerns associated with computer science. Students will also be given the opportunity to undertake a range of programming tasks that will allow them to develop their skills to design, write, test and refine programs using a high-level programming language.

Term/Length of Time	Outline	Assessment/Teacher Feedback Opportunities	Homework and Literacy resources
Autumn 1	<p><b>Computer Systems Architecture</b> Students will gain an understanding of the structure and purpose of the Central Processing Unit (CPU) which includes the fetch-execute cycle, common CPU components and their function (Arithmetic Logic Unit, Control Unit, Cache and Registers) and the Von Neumann architecture registers (Memory Address Register, Memory Data Register, Program Counter and Accumulator)</p> <p>Students will also look at the factors affecting the performance of a CPU such as Clock Speed, Number of Core and Cache Size. Finally, they will be able to distinguish between a multi-purpose computer and an embedded system giving examples to demonstrate their understanding.</p> <p><b>Practical Programming</b></p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork.</p> <p>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.</p> <p>A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b> Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b> Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into <a href="#">Systems Architecture</a></p> <p>Complete lessons 2 and 3 on <a href="#">Computer Systems</a> from Oak National Academy</p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p> <p>Choose another computing language to learn from <a href="#">W3Schools</a></p> <p>Complete some Bronze/Silver/Gold badges on the <a href="#">IDEA Award</a> to showcase digital literacy and employability skills.</p> <p>Watch an episode of <a href="#">BBC Click</a> on the BBC iPlayer</p>

	Students develop their ability to create programs in Python using Inputs, Outputs, Variables and Casting.		Additional Reading for Budding Computer Scientists: <a href="#">Choose a book from this recommended reading list</a>
Autumn 2	<p><b>Computer Memory and Introduction to Number Systems</b></p> <p>Students will learn about and investigate various different types of primary storage methods and the need for primary storage. These will include Random Access Memory, Read Only Memory and Virtual memory.</p> <p>They will then move onto understanding the need for secondary storage methods and investigate common types of storage such as Optical, Magnetic and Solid State. Their knowledge will be deepened by understanding and explaining different storage devices and storage media suitable for a given application relating to capacity, speed, portability, durability, reliability and cost.</p> <p>Students will then develop their understanding of the different units of data storage, how data needs to be converted into a</p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork.</p> <p>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy. A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b></p> <p>Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b></p> <p>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into <a href="#">Memory/Storage</a> and <a href="#">Data Representation</a> topics.</p> <p>Complete lessons 4 through to 7 on <a href="#">Memory/Storage</a> from Oak National Academy</p> <p>Complete lessons 1 – 4 on <a href="#">Number Systems</a> from Oak National Academy</p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p> <p>Choose another computing language to learn from <a href="#">W3Schools</a></p> <p>Complete some Bronze/Silver/Gold badges on the <a href="#">iDEA Award</a> to showcase digital literacy and employability skills.</p>

	<p>binary format to be processed by a computer, data capacity and calculation of data capacity requirements, conversion of denary numbers into binary and hexadecimal.</p> <p><b>Practical Programming</b> Students develop their ability to create programs in Python using Selection and Iteration.</p>		<p>Watch an episode of <a href="#">BBC Click</a> on the BBC iPlayer</p> <p>Additional Reading for Budding Computer Scientists: <a href="#">Choose a book from this recommended reading list</a></p>
Spring 1	<p><b>Data Representation</b> Students will develop their understanding of how binary is used to represent characters, sound and images and also look at different compression techniques.</p> <p><b>Practical Programming</b> Students develop their ability to create programs in Python using String Manipulation.</p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork.</p> <p>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.</p> <p>A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b> Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b> Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into <a href="#">Data Representation</a> topics.</p> <p>Complete lessons 6 - 8 on Data Representation from <a href="#">Oak National Academy</a></p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p>

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Spring 2	<p><b>Networks</b> Students will gain an understanding of the different types of networks, the factors that affect the performance of networks, the hardware needed to connect stand-alone computers into a Local Area Network, different types of transmission media, the Internet, network topologies, modes of connection, encryption, IP addressing, MAC addressing, common protocols and the concept of layers.</p> <p><b>Practical Programming</b> Students develop their ability to create programs in Python using File Handling techniques.</p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork.</p> <p>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.</p> <p>A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b> Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b> Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into Network topics <a href="#">here</a> and <a href="#">here</a></p> <p>Complete lessons 1 through to 6 on <a href="#">Networks</a> from Oak National Academy</p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p> <p>Choose another computing language to learn from <a href="#">W3Schools</a></p>

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Summer 1	<p><b>Network Security and System Software</b></p> <p>Students will develop their understanding of different threats to computer systems and networks and underpin their key knowledge/principles of each form of attack including how the attack is used and the purpose of the attack. This will be supported further by understanding how to limit the threats posed and the various methods to remove vulnerabilities.</p> <p>Following this students will start to develop an understanding and knowledge of the purpose and functionality of operating systems including user interface, memory management and multitasking, peripheral management and drivers, user management and file</p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork.</p> <p>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.</p> <p>A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b></p> <p>Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b></p> <p>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into <a href="#">Network Security</a> and <a href="#">System Software</a> topics</p> <p>Complete lessons 1 through to 7 on <a href="#">Network Security</a> and lesson 1 on <a href="#">System Software</a> from the Oak National Academy</p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p> <p>Choose another computing language to learn from <a href="#">W3Schools</a></p>

	<p>management. This will lead into the purpose and functionality of utility software including encryption software, defragmentation and data compression.</p> <p><b>Practical Programming</b> Students develop their ability to understand the use of Databases and Structured Query Language (SQL) when programming.</p>		<p>Complete some Bronze/Silver/Gold badges on the <a href="#">iDEA Award</a> to showcase digital literacy and employability skills.</p> <p>Watch an episode of <a href="#">BBC Click</a> on the BBC iPlayer</p> <p>Additional Reading for Budding Computer Scientists: <a href="#">Choose a book from this recommended reading list</a></p>
Summer 2	<p><b>Wider Issues Surrounding Computer Science</b> Students will research and develop their understanding of the impacts of digital technology on wider society including ethical, legal, cultural, environmental and privacy issues. This will include how to approach and answer essay style questions in the examination. This unit will also link to our International Schools focus by investigating moral and environmental issues surrounding develop and underdeveloped countries.</p> <p><b>Practical Programming</b></p>	<p>Differentiated recall questions at the end of each sub-topic completed as part of classwork. Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy. A selection of written questions completed in class to assess understanding of programming techniques.</p>	<p><b>Minimum homework expectation - to be set on G4S</b> Completion of three (two theory + one programming) 30-minute revision/recall activities using an online platform called Smart Revise which is bespoke for OCR GCSE Computer Science.</p> <p><b>Optional homework tasks and Literacy resources</b> Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.</p> <p>Access BBC Bitesize and research more into the topics of <a href="#">Wider Computing Issues</a></p> <p>Complete lessons 1 through to 7 on <a href="#">Wider Computing Issues</a> from the Oak National Academy</p> <p>Develop your coding and work through some interactive python lessons/challenges from <a href="#">LGfL</a> or <a href="#">Python Principles</a></p> <p>Complete some 'Quiz' or 'Terms' questions using your <a href="#">Smart Revise</a> platform login.</p>

	<p>Students develop their ability to create programs in Python using 1D and 2D Arrays/Lists.</p>		<p>Choose another computing language to learn from <a href="#">W3Schools</a></p> <p>Complete some Bronze/Silver/Gold badges on the <a href="#">iDEA Award</a> to showcase digital literacy and employability skills.</p> <p>Watch an episode of <a href="#">BBC Click</a> on the BBC iPlayer</p> <p>Additional Reading for Budding Computer Scientists: <a href="#">Choose a book from this recommended reading list</a></p>
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