**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 |
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| Autumn 1 | **Computer Systems Architecture**<br>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)<br>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.<br><br>**Practical Programming** | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools<br><br>Complete some Bronze/Silver/Gold badges on the iDEA Award to showcase digital literacy and employability skills.<br><br>Watch an episode of BBC Click on the BBC iPlayer |

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| | Students develop their ability to create programs in Python using Inputs, Outputs, Variables and Casting. | | Additional Reading for Budding Computer Scientists: Choose a book from this recommended reading list some of which can be found in the department or the library |
| Autumn 2 | **Computer Memory and Introduction to Number Systems**<br>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.<br>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.<br><br>Students will then develop their understanding of the different units of data storage, how data needs to be converted into a | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools<br><br>Complete some Bronze/Silver/Gold badges on the iDEA Award to showcase digital literacy and employability skills.<br><br>Watch an episode of BBC Click on the BBC iPlayer<br><br>Additional Reading for Budding Computer Scientists: Choose a book from this recommended reading list some of which can be found in the department or the library |

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| | binary format to be processed by a computer, data capacity and calculation of data capacity requirements, conversion of denary numbers into binary and hexadecimal.<br><br>**Practical Programming**<br>Students develop their ability to create programs in Python using Selection and Iteration. | | |
| Spring 1 | **Data Representation**<br>Students will develop their understanding of how binary is used to represent characters, sound and images and also look at different compression techniques.<br><br>**Practical Programming**<br>Students will continue to develop their ability to create programs using Iteration. | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools |

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| Spring 2 | **Networks and Network Threats**<br>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.<br>Following this 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 | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools<br><br>Complete some Bronze/Silver/Gold badges on the iDEA Award to showcase digital literacy and employability skills. |

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| | further by understanding how to limit the threats posed and the various methods to remove vulnerabilities.<br><br>**Practical Programming**<br>Students develop their ability to create programs in Python using String Manipulation techniques. | | Watch an episode of BBC Click on the BBC iPlayer<br><br>Additional Reading for Budding Computer Scientists: Choose a book from this recommended reading list some of which can be found in the department or the library |
| Summer 1 | **System Software**<br>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 management. This will lead into the purpose and functionality of utility software including encryption software, defragmentation and data compression.<br><br>**Practical Programming**<br>Students develop their ability to create programs in Python using File Handling techniques. | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools<br><br>Complete some Bronze/Silver/Gold badges on the iDEA Award to showcase digital literacy and employability skills. |

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| Summer 2 | **Wider Issues Surrounding Computer Science**<br>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.<br>This unit will also link to our International Schools focus by investigating moral and environmental issues surrounding develop and underdeveloped countries.<br><br>**Practical Programming**<br>Students develop their ability to understand the use of Databases and Structured Query Language (SQL) when programming. | Differentiated recall questions at the end of each sub-topic completed as part of classwork.<br>Formal end of topic assessments that include a mixture of open and closed questions with an additional focus on keywords/literacy.<br>A selection of written questions completed in class to assess understanding of programming techniques. | **Minimum homework expectation - to be set on G4S**<br>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.<br><br>**Optional homework tasks and Literacy resources**<br>Creation of revision resource (e.g. mind map) to be submitted alongside compulsory activity.<br><br>Access BBC Bitesize and research more into this topic area<br><br>Complete additional lessons on this topic from Oak National Academy<br><br>Develop your coding and work through some interactive python lessons/challenges from LGfL<br><br>Complete some recall questions using your Revise: CSUK platform login.<br><br>Choose another computing language to learn from W3Schools<br><br>Complete some Bronze/Silver/Gold badges on the iDEA Award to showcase digital literacy and employability skills.<br><br>Watch an episode of BBC Click on the BBC iPlayer |

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