

What are the aims and intentions of this curriculum?

The aim of our Year 9 Curriculum is to:

- Understand the components that make up digital systems, and how they communicate with one another and with other systems;
- Understand the impacts of digital technology to the individual and to wider society;
- Apply mathematical skills relevant to Computer Science;
- Develop practical skills in Microsoft Office;
- Think creatively, innovatively, analytically, logically and critically in developing algorithms.

| Term | Topics | Knowledge and key terms | Skills developed | Assessment |
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| Summer 2 | <p>Transition</p> <p>Alliance Challenge</p> <p>Introduction to Systems Architecture: <i>Parts of a Computer</i></p> <p>What is a computer?</p> <p>Input Devices and their applications</p> <ul style="list-style-type: none"> • Categories (keyed, pointing, biometric, voice, video, scanners) <p>Output Devices and their applications</p> <ul style="list-style-type: none"> • Types <p>Devices for the disabled</p> | <p>Students should be able to:</p> <ul style="list-style-type: none"> • Define the term computer. • Explain the term hardware. • Label the parts of a computer. • Give the names of at least four (4) input and output devices. • Justify the difference between input and output devices. • Discuss the applications of input and output devices in various industries. • Examine how the disabled interacts with computer systems. | <p>Team building and collaborative skills, communicative and problem solving skills</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • identify different parts of the computer system without assistance. • justify the difference between hardware and software. • correctly identify images of various input and output devices. • apply their knowledge of various input and output devices including ones used by the disabled to different scenarios. | <p>FORMATIVE:</p> <ul style="list-style-type: none"> • Group work • Discussions • Peer assessment <ul style="list-style-type: none"> • Create models: computer/any input or output device. • Group Presentations • Spelling test • End of topic quiz • End of term test • Seneca Online activities • Microsoft Teams collaborative • Case Studies • Reflection writing • Home work • Class Discussions • Worksheets |

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| Practical Keyboarding Skills | <ul style="list-style-type: none">• The benefits of touch typing• Computer Ergonomics• Finger Placement: The home keys• Beyond the home keys | <ul style="list-style-type: none">• touch type• use proper posture when using the computer. | <ul style="list-style-type: none">• Create a finger placement poster• Worksheets• End of topic speed and accuracy practical• Ongoing observation throughout the school year.• Online activities: https://www.teachingideas.co.uk/computing/typing-resources-for-schools |
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| Systems Architecture: The CPU | <ul style="list-style-type: none">• the purpose of the CPU• Von Neumann architecture:<ul style="list-style-type: none">✓ MAR (Memory Address Register)✓ MDR (Memory Data Register)✓ Program Counter✓ Accumulator• common CPU components and their function:<ul style="list-style-type: none">✓ ALU (Arithmetic Logic Unit)✓ CU (Control Unit)✓ Cache• the function of the CPU as fetch and execute instructions stored in memory• how common characteristics of CPUs affect their performance:<ul style="list-style-type: none">✓ clock speed✓ cache size✓ number of cores | <ul style="list-style-type: none">• describe the structure of the central processing unit and the functions of its components.• draw and explain the fetch-decode-execute cycle.• explain the need for and role of multiple cores and cache. | <ul style="list-style-type: none">• Team teaching• Challenge: Recreate the Von Neumann Architecture• Spelling test• Seneca• End of topic quiz• End of term test• Home Work• Class Discussions• Worksheets |
| Embedded systems | <ul style="list-style-type: none">• purpose of embedded systems• examples of embedded systems | | <ul style="list-style-type: none">• End of topic quiz |

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| Autumn 2 | Practical: Advanced Features of Microsoft Word | <ul style="list-style-type: none"> • Formatting features: bullets/numbering, superscript, subscript, highlight, change case • Working with shapes and images • Create tables, forms and columns • Mail Merge | <ul style="list-style-type: none"> • create a Word document using shapes and images and apply appropriate formatting features. • create mail merge for required purposes. | <ul style="list-style-type: none"> • Electronic and hardcopy Portfolio • Worksheets • Practical tests |
| | Primary Storage (Memory) <ul style="list-style-type: none"> • RAM • ROM • Virtual Memory • Flash Memory | <ul style="list-style-type: none"> • the difference between RAM and ROM • the purpose of ROM in a computer system • the purpose of RAM in a computer system • the need for virtual memory • flash memory | <ul style="list-style-type: none"> • explain the need for and role of virtual memory. | <ul style="list-style-type: none"> • Spelling test • Seneca • End of topic quiz • End of term test • Reflection writing • Home Work • Class Discussions • Worksheets |
| | Secondary Storage <ul style="list-style-type: none"> • The need for secondary storage • What is Storage Capacity? • Calculation of data capacity requirements • Types <ul style="list-style-type: none"> -optical -magnetic -solid state • suitable storage devices and storage media for a given application • Advantages and | <ul style="list-style-type: none"> • Know why secondary storage is needed. • Define storage capacity. • Calculate data capacity. • Distinguish between the types of secondary storage devices. • Select appropriate storage device for a given scenario. • List at least 3 advantages and three (3) disadvantages of secondary storage devices. | <ul style="list-style-type: none"> • Discuss the need for secondary storage. • Describe secondary storage media and the advantages and disadvantages of each. • Calculate data capacity requirements based on given scenario. • Examine the advantages and advantages of storage devices. | <ul style="list-style-type: none"> • Spelling test • Debate • Seneca online activities • Interview: The use of secondary storage devices (written, audio or video) • End of topic quiz. • End of term test • Home Work • Class Discussions • Worksheets |

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| Spring 1 | disadvantages using these characteristics: capacity, speed, portability, durability, reliability, cost | | | |
| | Practical: Microsoft Excel | <ul style="list-style-type: none"> • Features of Microsoft Excel • Entering Data • Formatting your spreadsheet • Formulae and simple functions • Creating charts • | <ul style="list-style-type: none"> • produce an excel document comprising of formulae, simple functions and charts. | <ul style="list-style-type: none"> • Electronic and hardcopy Portfolio • Practical tests • Worksheets |
| | Network: Wireless and Wired <ul style="list-style-type: none"> • Types of networks: <ul style="list-style-type: none"> ✓ LAN (Local Area Network) ✓ WAN (Wide Area Network) • the different roles of computers in a client-server and a peer-to-peer network • the hardware needed to connect stand-alone computers into a Local Area Network: <ul style="list-style-type: none"> ✓ wireless access points - routers/switches ✓ NIC (Network Interface Controller/Card) ✓ transmission media • the internet as a | <ul style="list-style-type: none"> • Explain what is meant by a computer network and list the different types of networks. • Describe the differences between client server and peer-to-peer networks. • Explain the functions of the hardware needed to connect computers. • Explain how computers communicate using cable and wireless transmission media. • factors that affect the performance of networks • Explain how users connect to and use the internet. • Explain how virtual networks can be set up. | <ul style="list-style-type: none"> • Illustrate the concept of different networks. • identify various network hardware • Discuss the factors that affects the performance of a network. • decipher performance issues from given scenarios. • elaborate on the concept of cloud computing. | <ul style="list-style-type: none"> • Spelling test • Poster: Network Devices • Seneca online activities • Interview: The use of secondary storage devices (written, audio or video) • End of topic quiz. • End of term test • Home Work • Class Discussions • Worksheets |

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| Spring 2 | worldwide collection of computer networks: ✓ DNS (Domain Name Server) ✓ hosting ✓ the cloud • the concept of virtual networks. | | | |
| | Practical: Database Management | • What is a database? • Features of a database • Creating tables • Creating Relationships • Creating simple queries | • create database tables • link tables • create simple queries on related tables | • Electronic and hardcopy Portfolio • Worksheets • Practical tests |
| | Network: <i>Topologies, Protocols and Layers</i> <ul style="list-style-type: none"> star and mesh network topologies Wifi: <ul style="list-style-type: none"> ✓ frequency and channels ✓ encryption Ethernet the uses of IP addressing, MAC addressing, and protocols including: <ul style="list-style-type: none"> ✓ TCP/IP (Transmission Control Protocol/Internet Protocol) ✓ HTTP (Hyper Text Transfer Protocol) ✓ HTTPS (Hyper Text Transfer Protocol Secure) ✓ FTP (File | • Distinguish between star and mesh topologies • Explain the characteristics of WiFi • Identify the purpose and features of Ethernet. • Explain the use of protocols. | • draw a star and mesh network • tell the meaning of the abbreviation WiFi and the protocol that governs it. • compare different protocols. • answer the question; why are network layers important. • create a mnemonic for | • Spelling test • Debate • Seneca • Interview: The use of secondary storage devices (written, audio or video) • End of topic quiz. • End of term test • Home work • Reflection writing • Class Discussions • Worksheets |

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| Summer 1 | <p>Transfer Protocol)</p> <ul style="list-style-type: none"> ✓ POP (Post Office Protocol) ✓ IMAP (Internet Message Access Protocol) ✓ SMTP (Simple Mail Transfer Protocol) • the concept of layers • packet switching. | <ul style="list-style-type: none"> • Organize the network layers in their respective order (sending or receiving) • Explain how data is transmitted across networks. | <p>network layers</p> <ul style="list-style-type: none"> • demonstrate how packet switching is done. | |
| | <p>Practical: Database Management Cont'd</p> | <ul style="list-style-type: none"> • Creating forms • Creating simple reports | <ul style="list-style-type: none"> • create a form of their choice and simple report for specific tables. | <ul style="list-style-type: none"> • Electronic and hardcopy Portfolio • Worksheets • Practical tests |
| | <p>Algorithms: <i>Computational Thinking and How to produce algorithms using pseudocode and flowcharts</i></p> | <ul style="list-style-type: none"> • Explain what an algorithm is. • Computational thinking <ul style="list-style-type: none"> ✓ Abstraction ✓ Decomposition ✓ Algorithmic thinking • Create, name and use suitable variables. • standard searching algorithms: <ul style="list-style-type: none"> ✓ binary search ✓ linear search • standard sorting algorithms: <ul style="list-style-type: none"> ✓ bubble sort ✓ merge sort ✓ insertion sort • how to produce algorithms using pseudocode and flowcharts • interpret, correct or complete algorithms | <ul style="list-style-type: none"> • Explain what is meant by computational thinking • Explain what is meant by <i>decomposition</i> and <i>abstraction</i> and use them to solve problems • Explain what is meant by top-down and bottom-up problem solving • create, name and use suitable variables. • Describe the linear and binary search algorithms • Use these algorithms to search sorted and unsorted lists • Explain why sorted lists are of more value than unsorted lists • Describe the bubble sort, | <ul style="list-style-type: none"> • Spelling test • Debate • Seneca • Interview: The use of secondary storage devices (written, audio or video) • End of topic quiz. • End of term test • Home work • Class Discussions • Worksheets |

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| | | <p>selection sort and merge sort algorithms</p> <ul style="list-style-type: none">• Use these algorithms to sort lists into ascending and descending order• create algorithms to solve specific problems<ul style="list-style-type: none">✓ creating flow charts✓ creating pseudocode✓ Analyse algorithms using trace tables. | |
| <p>Practical (programming techniques):</p> <p>Introduction to Python</p> <p>Python Fundamentals</p> | <ul style="list-style-type: none">• What is programming?• Identify the purposes of python.• Python syntax• Python comments• Python variables• Python data types• Python numbers• Python strings• Python casting• Python Boolean• Python operators• Python list• Python tuples• Python sets• Python dictionaries | <ul style="list-style-type: none">• download and install python on their personal computers• open and use appropriate applications in python.• Correctly transfer hardcopy code into python software.• Add appropriate comments in python | <ul style="list-style-type: none">• Electronic and hardcopy Portfolio• Worksheets• Practical tests• Home work• Class Discussions |
| <p>Personal Enrichment (Project)</p> | <p>Learn at least one (1) of the listed programming languages using own initiative.</p> | <p>Produce a robust program using at least one (1) of the following:</p> <ul style="list-style-type: none">• C, C#, C++• Java• JavaScript• Visual Basic/.Net• PHP• Delphi• BASIC | <ul style="list-style-type: none">• Problem identification, assessment and development activities |