



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
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

<p>Practical Keyboarding Skills</p>	<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
<p>Systems Architecture: The CPU</p>	<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
<p>Embedded systems</p>	<ul style="list-style-type: none"> • purpose of embedded systems • examples of embedded systems 		<ul style="list-style-type: none"> • End of topic quiz

	<p>Practical:</p> <p>Advanced Features of Microsoft Word</p>	<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
<p>Autumn 2</p>	<p>Primary Storage (Memory)</p> <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
	<p>Secondary Storage</p> <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

	<p>disadvantages using these characteristics: capacity, speed, portability, durability, reliability, cost</p>			
	<p>Practical: Microsoft Excel</p>	<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
<p>Spring 1</p>	<p>Network: <i>Wireless and Wired</i></p> <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

	<p>worldwide collection of computer networks:</p> <ul style="list-style-type: none"> ✓ DNS (Domain Name Server) ✓ hosting ✓ the cloud • the concept of virtual networks. 			
Spring 2	<p>Practical:</p> <p>Database Management</p>	<ul style="list-style-type: none"> • What is a database? • Features of a database • Creating tables • Creating Relationships • Creating simple queries 	<ul style="list-style-type: none"> • create database tables • link tables • create simple queries on related tables 	<ul style="list-style-type: none"> • Electronic and hardcopy Portfolio • Worksheets • Practical tests
	<p>Network: <i>Topologies, Protocols and Layers</i></p> <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 	<ul style="list-style-type: none"> • Distinguish between star and mesh topologies • Explain the characteristics of WiFi • Identify the purpose and features of Ethernet. • Explain the use of protocols. 	<ul style="list-style-type: none"> • 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 	<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 • Reflection writing • Class Discussions • Worksheets

	<p>Transfer Protocol)</p> <ul style="list-style-type: none"> ✓ POP (Post Office Protocol) ✓ IMAP (Internet Message Access Protocol) ✓ SMTP (Simple Mail Transfer Protocol) <ul style="list-style-type: none"> • 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. 	
Summer 1	<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
Summer 1	<p>Algorithms: Computational Thinking and How to produce algorithms using pseudocode and flowcharts</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

		<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): Introduction to Python 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