



Year 10 Computer Science Curriculum Map						
Half Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Big Themes</p>	<p>Systems architecture looking at the architecture of the CPU, the performance of CPUs including embedded systems. Students will learn how primary and secondary storage is used within a computer system and data storage.</p>	<p>Binary, data representation and Computer networks. Students will learn how information is stored and processed on a computer system as well as how this information is transmitted over computer networks.</p>	<p>Computer network hardware and security. Students will look at the physical components of a computer network and how they link together. Students will also look at how networks can be attacked.</p>	<p>Securing computer networks. Operating Systems and Utility Software Students will be looking at a range of common techniques that can help prevent computer networks from being attacked. Students will learn about system software.</p>	<p>Ethical, legal, cultural and environmental impact of technology Students will look at the impact of technology for a wide range of scenarios. Students will look at Legislation relevant to Computer Science.</p>	<p>Computational thinking, algorithms and programming Students will learn the principles of computational thinking and designing, creating and refining algorithms.</p>
<p>Knowledge and skills covered</p>	<ul style="list-style-type: none"> • The purpose of the CPU and the fetch-execute cycle. Von Neumann architecture: including: MAR, MDR, Program Counter & Accumulator • How common characteristics of CPUs affect their 	<ul style="list-style-type: none"> • Convert positive denary whole numbers into 2-digit hexadecimal numbers and vice versa • Convert binary integers to their hexadecimal equivalents and vice versa • Binary shifts 	<ul style="list-style-type: none"> • Star and mesh network topologies • Modes of connection: Wired, Ethernet, Wireless, Wi-Fi, Bluetooth, Encryption • IP addressing and MAC addressing • Network standards • Common protocols including: TCP/IP, HTTP, HTTPS, FTP, POP, IMAP, SMTP 	<ul style="list-style-type: none"> • Identifying and preventing vulnerabilities in Computer Networks & Common prevention methods: • Penetration testing • Anti-malware software • Firewalls • User access levels • Passwords • Encryption 	<ul style="list-style-type: none"> • Impacts of digital technology on wider society including: • Ethical issues • Legal issues • Cultural issues • Environmental issues • Privacy issues • Legislation relevant to Computer Science: 	<ul style="list-style-type: none"> • Principles of computational thinking: • abstraction • decomposition • algorithmic thinking • Identify the inputs, processes, and outputs for a problem • Structure diagrams • Create, interpret, correct, complete, and refine algorithms using:



	<p>performance: clock speed, cache size & number of cores</p> <ul style="list-style-type: none">• The purpose and characteristics of embedded systems• The difference between RAM and ROM• The purpose of ROM and RAM• Virtual memory• Common types of storage: optical, magnetic & solid state• How to convert positive denary whole numbers to binary and vice versa• How to add two binary integers together (up to and including 8 bits) and explain overflow errors which may occur	<ul style="list-style-type: none">• The use of binary codes to represent characters• How an image is represented as a series of pixels• Character sets, ASCII & Unicode• Metadata, colour depth and resolution• How sound can be sampled and stored in digital form• Compression: lossy & lossless.• Types of networks: LAN & WAN• The hardware needed to connect stand-alone computers into a Network• The internet and DNS (Domain Name Server)	<ul style="list-style-type: none">• The concept of layers• Forms of attack:• Malware• Social engineering, e.g. phishing, people as the 'weak point'• Brute-force attacks• Denial of service attacks• Data interception and theft• The concept of SQL injection	<ul style="list-style-type: none">• Physical security• The purpose and functionality of operating systems:• user interface• memory management and multitasking• peripheral management and drivers• user management• file management• the purpose and functionality of utility software• utility system software:• encryption software• defragmentation• data compression	<ul style="list-style-type: none">• The Data Protection Act 2018• Computer Misuse Act 1990• Copyright Designs and Patents Act 1988• Software licences (i.e. open source and proprietary)	<ul style="list-style-type: none">• pseudocode• flowcharts• reference language / high-level programming language
<p>Knowledge organisers and more detailed topic resources can be found on all student Google Classrooms</p>						



Year 10 Key 'Subject' Assessment Dates 2021-22		
Data Drop 1	Data Drop 2	Data Drop 3
Revision Focus: Each topic taught this term. Assessments: Written end of topic tests Feedback sessions: At the end of each topic	Revision Focus: Each topic taught this term. Assessments: Written end of topic tests Feedback sessions: At the end of each topic	Revision Focus: Each topic taught this term. Assessments: Written end of topic tests Feedback sessions: At the end of each topic